

Mobile Application Marketplaces - an Investigation from Customers' Perspective

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1 Motivation

Newest publications resume the impact of application marketplaces as an arbitrage competitive advantage in the market of mobile devices (Laube 2009, p. 8). Neologisms like “App-Mania” (Sandin 2009, p. 1) stand for this evolution on the mobile side. On the PC side other trends in form of Software-as-a-Service or electronic marketplaces and neologisms like Web Service Ecosystem (Barros 2006, p. 31) show the same trend. Enterprises offer flexible services to customers in a direct internet access without modal fragmentation. Schäfer (2008, p.20) looks at these new forms of value chain, in which new alliances are built between cooperating and competitive partners (cooptition). Feng (2009, p. 242) mentions the value chain through mobile application marketplaces as consumer-to-consumer (C2C) channel for digital goods. He sees the innovative aspects to be the active consumer participation and appraises this form of value chain as a new digital business strategy for distributing information goods.

In the year 2008 for the first time consumers in the USA spent more money for the applications of their mobile device than for the device itself, as an actual research study of ABI Research showed (2009, p. 52 et seq.). The mobile device itself links the customer irrevocable to the on-device marketplace: iPhone users are not allowed to install applications from any other origin than the AppStore (Apple 2008, p.1). But what importance has the existence and the diversity of the application marketplace on the choice for a mobile device?

2 Theoretical grounding

2.1 Basic definitions

The commodities merchandised in mobile application marketplaces are digital ones. Their non-existence of physical proportions leads to the fast distribution and unlimited availability through network systems. Their nearly cost free duplication (Illik 1998, p. 15) differs additionally from the characteristics of physical economic goods (Tietz 1993, p. 22), but also show the commonness, as they are the asset of a programming value chain (Schmidt 2007, p. 27).

Following a literature review Wirtz defines electronic commerce as containing the electronic support of all business activities, that happen in direct combination to a purchase or disposal process of goods or services operated via electronic networks (2001, p. 40). The term electronic marketplace is in addition interpreted in different ways. Zimmermann centered in his marketplace definition the community based functionalities with the term ancient agora (1997, p. 118). Further other authors see the term point out to operational view in the function for collaboration internet-based infrastructures for negotiation and transaction (Lavassani 2008, p. 2) or enabling potential trading partners to be identified and a transaction to be executed (Choudhury 1998, p. 473). One of the newest definitions is made by O'Reilly. He derives an operational definition by electronic marketplaces being an *“organizational intermediary that electronically provides value added communication, brokerage and integration services to buyers and sellers of direct and/or indirect products and/or services in specific horizontal or vertical markets by supporting basic market functions, meeting management needs for information and process support, and/or operating the required IS/IT infrastructure”* (2008, p. 2). Mobile commerce notwithstanding is located in the thematically intersection of digital convergence on the one and e-Commerce on the other hand (Nicolai 2001, p. 2). Nicolai's fear of nominating mobile commerce as a future hype in 2001 is based on the lacking behind of their forecasts of e-Commerce and the digital convergence. This reserve is exemplary for the rapid change within the last two years.

Portals hold the role as intermediary between information and customers. In this occurrence they behave like aggregators and brokers for classifying, structuring and presenting information. Therefore portals provide the clustered offerings of online-systems (Schmidt 2003, p. 183). In addition they are considered to be central entrance- and navigation-points, which is sine qua non for the mass of visitors and therefore the emerging exchange. An increasing number of mobile portals, in which actors develop and sell their digital products, arise as mentioned in the introduction. But what are the relevant new aspects of these marketplaces?

2.2 Mobile application marketplaces

In a definition of mobile application marketplaces the above defined terms have to be broadened about following ideas:

The goods offered in these mobile application marketplaces are a subset of the term digital goods. They must not fulfill the definition of an application, therefore it can also be an mp3 or just a background. But they are summarized under the application term as it is included in the market names (App Store¹ or Blackberry App World²). As mentioned in the definition of digital goods they meet the characteristic of being an outcome of a value chain. They are a subset because of their explicit development for being used on one family or even one type of mobile devices.

The term electronic marketplace is applicable for mobile application marketplaces in the fields of connecting buyers and sellers, supporting basic market functions as payment, commission and annotation, enabling potential trading partners to be identified and their transaction to be executed. Using the subset term mobile marketplace, it's nearly exactly the term mobile application marketplace, but missing a mention of the opening for public. But particularly the opening for public is the pillar causing the success by publishing a software development kit for the devices and giving every developer the possibility to sell their products on this marketplace.

The term portal is also valid for mobile application marketplace as the devices are connected to these by default for listing existing applications, giving information of their functionality, showing user comments and download rates. They fulfill the term portal in the field of aggregating information for customers, clustering their offerings and being central entrance-points.

Figure 1 shows the filling of mobile application-marketplace in these three fields:

Keeping the related research fields and their topics in mind, a mobile application marketplace can be defined as

- an intermediary platform for getting together the offer and demand for digital goods
- through a mobile commerce portal linked to a specified type or family of types of mobile devices,
- in which arbitrary developers offer the results of their programming work based on published software development kits,
- in which users of the mobile device can look for, shop, download, use, review and comment as many offerings as they want to.

¹ For more information about the Apple App Store see the internet representation of the store on <http://www.apple.com/iphone/apps-for-iphone/>

² For more information about the Blackberry App World see the internet representation of the store on <http://na.blackberry.com/eng/services/appworld/?>

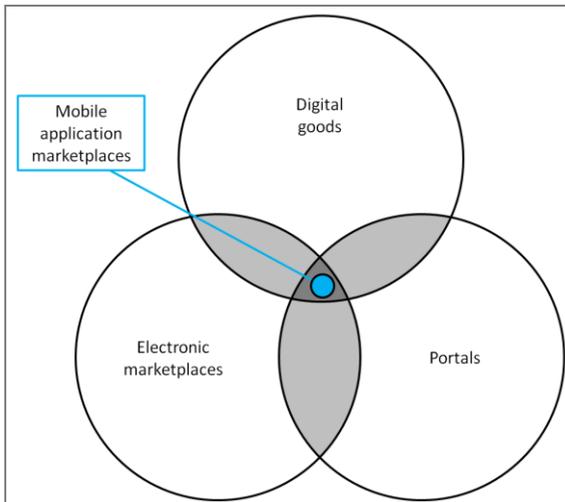


Figure 1: classification by definition of mobile application marketplaces

This definition of mobile application marketplaces widens the aspects of electronic marketplaces, of portals, of digital goods and of mobile marketplaces about two, innovative topics regarding the former known marketplaces: First topic is the publishing of a software development kit for the mobile devices and the opening of the marketplace through this announcement for arbitrary developers. Second aspect is the strong linkage between the marketplace and the mobile device. This leads those marketplaces initiators to a nearly monopoly position regarding their mobile device customers³.

3 Research Approach

3.1 Method

The research goal is an understanding of the impact fields in the choice for a smartphone with disregarding monetary influences. The choice for a specific device is the arbitrarive moment for linking a customer to a mobile application marketplace. As those mobile devices linked to an application marketplace are nowadays still expensive, we ask every interviewee to ignore monetary aspects during choice process.

Because there are no integrated concepts for mobile application marketplaces in literature, a qualitative research method is used. For this work several elements

³ The first aspect of allowing consumers' active participation and development is already mentioned as a innovative way of customer-to-customer-channel (C2C) of value chain for digital goods by Feng (2009, p. 242).

of Grounded Theory according to Glaser and Strauss are being used (Glaser 1967, p. 1 et seq.). It is rather a style how to analyze qualitative data than a specific method or technique (Strauss 1996, p. X). In contrast to other methods, the Grounded Theory does not start with a theory that should be proved. It starts with a research question and lets the theory evolve itself. For this reason, this paper starts not with a certain number of existing hypotheses but asks generally and impartial for aspects in the choice for a mobile device and concretizes them during this examination. In order to achieve these factors we conducted interviews in an iterative way until the theoretical saturation was achieved. Altogether 57 participants have been interviewed. For data analysis we used open and selective coding according to Strauss and Corbin (Strauss 1990, p. 61).

The initial focus according to Strauss (1996, p. 152) as base of theoretical sensitivity we substantiate in addition to the literature research fields mentioned above is given through personal usage and self programming experience for smartphones. With critical respect to this experience, the first round interviews are kept open and under four-eye-principle. The closing of this first phase is an open coding and selective coding process for developing both core and second level categories.

3.2 Sample

For reaching interviewees with a relative high technological affinity and a basic knowledge concerning mobile devices, we choose a sample of young aged people between 22 and 30 years old.

The first sample is composed of 17 participants between 22 and 30 years old (13 male, 4 female). The question on their state of knowledge concerning mobile devices, asked in a ordinal, five-point scale between one (meaning no knowledge) and five (meaning expert knowledge) results uniformly distributed with a median of 3 (meaning temperate knowledge).

Second and third interview samples are altogether based upon 40 participants between 22 and 32 year old (19 male and 21 female participants). Regarding the knowledge concerning mobile devices this sample points out same median as the first one (3 meaning median knowledge).

3.3 Interviews

In this first round the interview sample (Straus 1996, p. 156) is composed of random people younger age to initialize the answer categories and see the actual answering situation. During this phase with open questions participants were asked for their cell phone respectively smartphone knowledge, their preference for one mobile device at nonobservance of monetary influences and their causes for the given preferences for measurement of the impact of a mobile application-marketplace.

The second and third interview phase samples consist of random young people too and were initiated for tightening the categories. These phases provide a validation of the predicated categories and a discovery of preferably much second level input (Glaser 1998, p. 57). Hence these interviews were based on answer options of already existent categories by giving these their statistical weight. The interviews are broadened by open questions for allowing the appearance of new categories too. All given impacts of the categories on the choice for a mobile device are asked for at nonobservance of monetary influences.

3.4 Coding

According to Glaser (1978, p. 46; 1992, p. 103) we complete the first phase with an open and selective coding process by using the first sample for initializing both core and second level categories. By reviewing the sample three core categories of impact fields are configured concerning the choice for a mobile device, namely design, function and brand. Further information of the core categories and those in second level is pictured in Figure 2.

All second level categories represent a bundle of mobile device attributes, which are mentioned during the next interview phases. Concerning the core category design we cluster following subclasses: Class form of mobile device also includes terms like size, existence of a keyboard, whether it needs to be flapped or dozed and screen size. Visual appearance means the subjective liking of the overall appearance of the mobile device instead. The core category brand unifies all brand oriented influences that are independent to the mobile device characteristics: Brand image is used as generic term for all aspects, the interviewee associate with the mobile device brand and influence their choice concerning attributes as cool, environmental friendly or modern. Social environment stands for the influence of friends or family as well as the significance of a mobile device in the interviewee's friendship. The core category function contains all mobile device functionalities regarding the technical, direct functions as well as the software, indirect programmed functions. The second level categories of this core are not exactly disjunctive as the existence of an application-marketplace indirectly leads to a higher range of applications. Notwithstanding applications during the interviews is interpreted as the preinstalled applications range like mail, games and contact, but also the possibility to widen this range independent whether that happens by using a marketplace or not. The term ease of use is not explained by other attributes due to the subjectivity of those aspects. The marketplace category as the focus of our interest is mentioned in this variety as one out of eight thus the interviewees recognize it inconspicuous. The marketplace category is explained during the interviews in terms of definition in chapter 2.2.

4 Results and arrangement

4.1 Impact of the 2nd level categories

Figure 2 shows the categories as result of the coding process based on the interview results of the first phase.

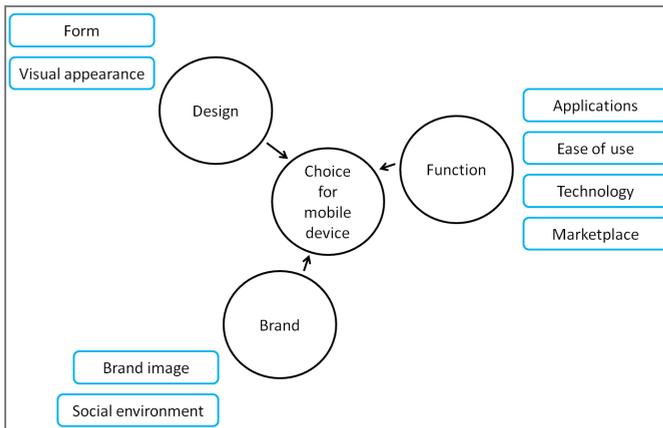


Figure 2: Impact fields in the choice for a mobile device at nonobservance of monetary influences

The impact of the different second level categories on the choice for a mobile device is measured in an ordinal five-point scale during the second and third interview phase (one representing no impact and five representing very high impact on this choice). As recommended for the given ordinal scale we use the median for a measurement of the impact and category comparison but the variance for analyzing the diffusion of the given answers. The classes form, visual appearance and ease of use are those with most given impact and relatively high consensus between the interviewees. Most other categories have a medium given impact except the core category due to our research goal, the marketplace and the second low-level impact class social environment. Notwithstanding the given low impact, these two categories differ widely concerning the variances: Whereas the variance regarding the social environment is very low in relation to the residual categories, the variance of the marketplace-category is conspicuously high. All results of the second and third interview phases regarding the eight categories are shown in Table 1.

Table 1: Given impact on 2nd level categories in the choice for a mobile device at nonobservance of monetary influences

Core category	Design		Brand		Function			
Second level category	Form	Visual appearance	Brand image	Social environment	Applications	Ease of use	Technology	Marketplace
Median	4	4	3	2	3	4	3	2
Variance	0,97	1,05	1,28	0,92	1,54	0,95	1,65	1,67

The form as well as the ease of use and the social environment show the minima of the resulted variances and hence show a higher level of agreement between the interviewees regarding these topics.

4.2 Utilization of results

The given impacts of the 2nd level categories can be used as benchmark scheme from customers' perspective for mobile devices. As not the existence of the mobile application marketplace but the choice for a mobile device links the customers' revenues to the market, the benchmark scheme shows how different devices meet the challenges from customers' viewpoints. Combining the categories by their given median weight overall 25 points can be achieved as the total of all medians (see Table 1). As showcase a benchmark is set with three mobile devices (iPhone 3G, HTC G1 and Blackberry Curve 8300) in a scale between zero (meaning bad) and three (meaning good). The ratings are derived by the appraisalment given in the german mobile community⁴ as the audience community with most users, the official ratings of the selected trademarks⁵ and technical data of the devices⁶. The overall ratings are shown in Table 2. The upper row of each device shows the given rating. The lower row is filed by the product of rating percentage and weight.

⁴ German mobile Community (<http://www.handy-mc.de/>)

⁵ Interbrand (http://www.interbrand.com/best_global_brands.aspx)

⁶ Technical Data CNET (http://www.cnet.com/8301-19736_1-10299291-251.html?tag=mncol;title), Apple (<http://events.apple.com.edgesuite.net/0906paowdvn/event/index.html?internal=ijalrmacu>), IT TIMES (<http://www.it-times.de/news/nachricht/datum/2009/07/09/blackberry-app-world-zaeht-2000-anwendungen/>)

Table 2: Rating comparison from customers' perspective

Core category	De- sign		Brand		Function				Σ
	Form	Visual appear- ance	Brand image	Social environ- ment	Applications	Ease of use	Technology	Marketplace	
iPhone 3G	3	3	3	1	3	1	3	3	
	4	4	3	0,7	3	1,3	3	2	21,0
HTC G1	2	2	2	2	2	3	3	3	
	2,7	2,7	2	1,3	2	4	3	2	19,7
BB Curve 8300	2	2	2	3	1	2	1	3	
	2,7	2,7	2	2	1	2,7	1	2	16,0

Concerning this rating, the three devices reach high scores in different categories as shown in Figure 3. All given scores are quoted by the given medians (for further information see appendix).

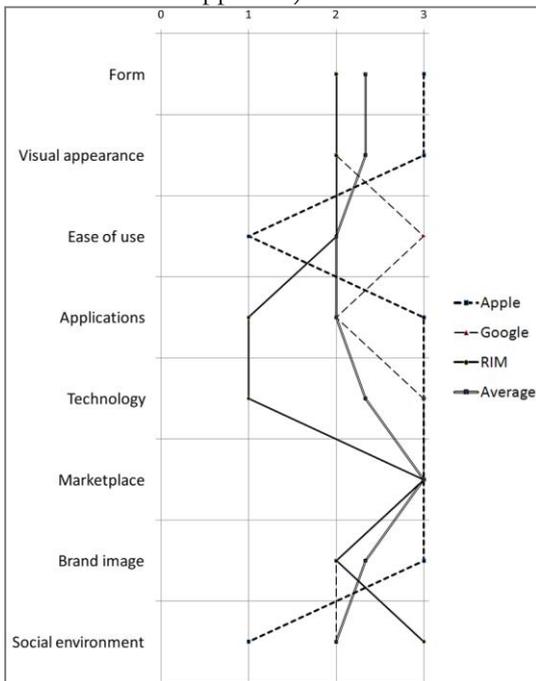


Figure 3: Benchmark based on resulting 2nd level categories

The showcase results in the following scores: 21.0 for iPhone 3G, 19.6 for the HTC G1 and 16.0 for the Blackberry Curve 8300.

4.3 Further interview results

Asked for their requirements concerning a mobile application marketplace in an open question, the most frequently answer is simplicity respectively ease of use given by 18 percent of all interviewees. A second also high rated condition for the use of a mobile application-marketplace is that the application respectively the market use is low-priced or even free of charge. The willingness to pay for applications in addition to the mobile fees is very low. Nearly ten percent of the interviewees also mention the diversity regarding the mobile application-marketplace as very important requirement for a frequent use. Most of these ten percent associate diversity with a numerous offer of games. But also tools regarding connection to computer, home entertainment and personal information systems used by the interviewees are contemplated in this context. Further answers are the clear arrangement of the application offers and the platform independency, which nowadays is fulfilled by none of the current mobile application marketplaces.

In a further, open question the participants are asked for their five main applications respectively software programs they want to use on their smartphones. In this context most interviewees state smartphone usual functionalities like email, calendar, maps etc. and only few further applications are named. In the order of their occurrence these usual functions are camera, telephony, music player, sms and mms (short messaging service and multimedia messaging service), internet, calendar and email. Expanding these mostly integrated functionalities further answers are games, navigation respectively maps, news ticker, weather forecast and internet radio. Overall none of the mentioned functionalities are really innovative or exceptional applications like those examples often shown in advertisings.

5 Conclusion and discussion

The interview result concerning the impact of an application marketplace is very surprisingly as the sales of those on-device marketplaces leads to different forecast. Customers nowadays get linked to a specific marketplace not by their active choice for one of them, but through the choice for a mobile device. The marketplace operators heighten their revenues not directly through a great diversity of offered applications but indirectly through offering best smartphones from customers' viewpoint. Simultaneous the high variance regarding this second level category shows the discordance between the interviewees. One cause for the variance could rely on an outcome gap between those participants already used to an application marketplace and those who not. Not the innovative applications, but the simplicity and cheapness are the main mentioned factors for market usage. In the field

of applications, the interviewees show a low number of additional ones to the commonly installed. Beside camera, mail, contacts, telephony, messages and email, games are the most frequent goal of application search. Closing these findings it must be acknowledged that all results are tentative due to the exploratory approach and the nonobservance of mobile device costs.

The result shows a research gap. Due to the high sales rates and the increased competitive pressure regarding the mobile business, new alliances between previous cooperators as well as competitors emerge weakly (e.g. Stöcker 2009, p. 1; Schäfer 2008, p. 20). Combining this evolution and analysts' prospects, the research concerning mobile application marketplaces and the innovative value chain they represent ought to follow the rapid growth. The ability for a transmittance of these new forms of value chain including the innovative potential of free and open development communities from mobile devices to e.g. home computers and the software industry can be an increasing research field.

As answered by one interviewee the platform independency of a mobile application marketplace is a nowadays very prospective aspect. As every mobile device or family of mobile devices has its own tied marketplace, customers can miss their familiar applications after changing their handheld. Changing to the developer's point of view this means that implementing one application for three marketplaces is synonym for implementing three complete different software applications using different programming languages and tools. This innovation slowdown will be hard to get over as those marketplace initiators are competitors and cooperation is far away. Further research can analyze why the given impact and associated with that the usage of the mobile application marketplaces is still on its beginning. Actual revenues speak a different language. The market potential concerning mobile application marketplaces for selling applications and developing applications is not approximately saturated concerning the interview field. This is an additional argument for the sales growth of these marketplaces to increase further as also analysts prospected.

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Appendix 1: Content of the 2nd level categories

Core category	Second level category	Aspects covered by this 2nd level category and mentioned by the sample
Design	Form	Slider; Flap mechanism; Size of screen; Keyboard.
	Visual appearance	
Brand	Brand image	Reputation; Quality; Environmental friendliness.
	Social environment	Influence by friends and family; Significance of the mobile device in friendship.
Function	Applications	Already installed functions of the device.
	Ease of use	Usability; Usage.
	Technology	Technical data; GPS; MP3; Camera; compatibility to home IT infrastructure; Operating system.
	Marketplace	Possibility to gain software from a mobile application-marketplace.

Appendix 2: Benchmark Data

	iPhone 3G	HTC G1	Blackberry Curve 8300
Form	3(3) Display 480x320 Pixel Displaysize diagonal 8,89 cm size: 116x62x12mm weight: 133g	2(3) Display 320x480 Pixel Displaysize diagonal 8,13 cm size: 118x56x17mm weight: 158g	2(3) Display 320x240 Pixel Displaysize diagonal 2,5 Zoll (6,35 cm) size: 107 x 60 x 16 mm weight: 111g
Visual appearance	3(3) Big screen; Flat device; Design userrate 2,8 (5) Number of Ratings: 505	2(3) bit smaller screen; Design userrate 4,7 (5); Number of Ratings: 2174	2(3) lower than iPhone but less weight; Design userrate 3,5 (5) Number of Ratings: 125
Ease of Use	1(3) Ease of use: 2,8 (5) Number of Ratings: 505	3(3) Ease of use: 4,8 (5) Number of Ratings: 2174	2(3) Ease of use: 3,6 (5) Number of Ratings: 125
Applications	3(3) Estimation 50.000 Ap- plications	2(3) Estimation 6.300 Applications	1(3) Estimation 2.000 Ap- plications
Technology	3(3) GPRS; WIFI; EDGE; WAP; WAP 2.0; UMTS; HSDPA; Blu- etooth; USB; GPS.	3(3) Java; GPRS; WIFI; EDGE; WAP; WAP 2.0; UMTS; HSDPA; HSUPA; Bluetooth; USB; GPS.	1(3) Java; GPRS; No WIFI; EDGE; WAP; WAP 2.0; Bluetooth; USB.
Market place	3(3) (existent: Apple AppStore)	3(3) (existent: Google Android market)	3(3) (existent: Blackberry AppWorld)
Brand image	3(3) (Apple Brand Value 13,724 m\$)	2(3) (Google Brand Value 25,590 m\$) (HTC not in the list)	2(3) (Blackberry Brand Val- ue 4,802 m\$)
environ- ment	1(3) Top list ranked 76	2(3) Top list ranked 15	3(3) Top list ranked 14
Sum	21(25)	19,7(25)	16(25)