Impact of Switching Costs and Network Effects on Selection of Mobile Platforms

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Abstract

We study the consumer selection of mobile platforms through switching costs and network effects. We operationalize switching costs using five dimensions (search cost, learning cost, contractual cost, complementary investments, brand relationship cost) and network effects using two dimensions (same and cross side network effects). We draw on four focus groups to empirically address the selection problem and our findings are three-fold. First, we show that complementary investments create strong switching costs through same and cross side network effects. Second, the selection of mobile platform seems to be moderated by brand relationships cost. Third, contractual costs in the form of contracts for carrier-device bundles exhibit strong switching cost for the duration of the contract. However, there is no indication of lasting effect for this switching cost after the contract term ends.

1. Introduction

The growth in smartphone market has led to the creation of mobile platforms and ecosystems. Gartner forecasts that in 2013 mobile phone shipments are expected to increase by 4.3% to over 1.8 million shipped units. In contrast, PC sales have decreased by 10.6% in 2013 from 2012 and are expected to decrease further in 2014. Also, brand preference for mobile device manufacturers and software platforms has been shifting. This development can be seen from volatile displacements of the previous market leaders: from Nokia’s Symbian to Apple’s iOS and then to Google’s Android. The current biggest platform providers, Google, Apple and Microsoft, leverage their ecosystems to attract and maintain consumers. In the first quarter of 2013 IDC estimates following market shares: Android 59.1%, iOS 23.0% and Microsoft’s Windows Phone 2.0%. These companies have created own ecosystems with different approaches to attract consumers. Android is an open platform and thus several different manufacturers produce Android based smartphones. Conversely, an integrated platform of Apple enables a full control over user experiences. On the other hand, Windows Phone strives to resemble PC version of Windows by offering applications such as SkyDrive allowing better synchronization with other Windows devices.

To deal with the shifting preferences, platform providers have started to use business strategies that raise switching barriers to protect existing market shares. Switching costs can be increased in number of ways. An option is to prevent data transfer among devices from different operating platforms. Another alternative is to provide extra benefits to multiple devices connected to the same operating platform. In addition, network effects are also relevant because amount of users and application developers that are using a platform affect to attracting new users and retaining existing ones. Platform providers can also implement various strategies to manage network effects. For example, by subsidizing application developers and offering free publishing rights, platform providers can attract more developers to publish applications for their operating platforms.

The primary objective of this research is to gain a deeper understanding about the impact of switching costs and network effects related to the mobile platforms (in this study mobile platforms refer to mobile software platforms such as Android, Windows Phone and iOS). It is important to examine user preferences in order to see how network effects and switching costs shape their buying decisions. Therefore, our research question is: When selecting a mobile platform, which dimensions of switching costs and network effects are accentuated and what is the interplay between the concepts of switching costs and network effects?


We examine the types of costs that users incur when they switch to different mobile platforms. During a switch to a different platform these costs can become “sunk costs”. Sunk costs have been found to influence on staying with the chosen course of action [2,10] and in IT contexts Mark Keil has gained lots of evidence of their strong impact on decision making behavior (see for example [13]). The question arises whether these “sunk costs” become sufficiently large to prevent users from switching to a different mobile platform.

Network effects play an important role in maintaining mobile platforms due to the same side and cross side network effects. The network theory implies that there is an exponential growth to a user base as users prefer the most popular platforms due to better interactions with the fellow users. If there are more developers that are affiliated to a platform then it will attract more users due to greater number of available applications. Similarly, if there are more users on a particular platform, it will attract more developers as there is a large market to explore. Consequently, organizations use different strategies to manage network effects and thus it is important to examine how network effects influence users.

The paper is organized as follows. After this introduction, in section Two, we present the relevant literature on switching costs and network effects and operationalize those constructs to the context of mobile platforms. In the third section, we discuss the focus group methodology employed. The fourth section presents the findings of the empirical study. In the remaining sections, we discuss the theoretical and managerial implications of the study.

2. Literature review

2.1. Switching costs

Klemperer [15] has outlined switching costs to be a differentiation factor among the homogenous products after their purchase. Definitions on the types of the switching costs vary between different authors. For example, Klemperer [15] outlines four possible switching costs. The first two switching costs are learning costs and transaction costs which are considered to be social costs. In the absence of these two social costs, there are possibilities for the third artificial switching cost or the fourth contractual switching cost to be present, both of which can be controlled directly by a firm. For example, a firm can encourage repeated purchases from a customer by offering discount coupons or customer loyalty points that can be redeemed. Similarly, companies can offer customers to sign a contract that will bind customer to make specific purchases or pay penalty if a contract is left unfulfilled. On the other hand, Jones et al. [12] have used a different approach in defining switching costs by creating three categories of switching costs. These categories are: continuity, learning and sunk costs. Continuity costs include lost performance costs and uncertainty costs. Lost performance costs refer to the loss of discounts, which were earned as a result of repeated purchases, after consumer makes a switch. Uncertainty costs refer to the perception of risk due to varied level of quality between the different providers. The learning costs consist of pre-switching search costs and evaluation costs, post-switching behavior and cognitive costs, and setup costs. Pre-switching search costs and evaluations costs refer to gathering information about different alternatives. Post-switching behavioral and cognitive costs refer to getting accustomed to the new service. The setup costs refer to the monetary fee that customer has to pay in order to start using the services or products from a new provider. Lastly, the sunk costs refer to the perceptions of time, money and required effort prior to the switching. Jones et al. [12] have found that each of these cost dimensions correlate with the repurchase intention, however the lost performance costs have the strongest effect on repurchase intention over the other switching costs.

An alternative definition for the switching costs is provided through a typology that categorizes switching costs into three categories [4]. First category is procedural switching costs that are related to the loss of time and effort. The procedural switching costs consist of: economic risk that refers to uncertainty about selecting a new provider, evaluation costs that involve time and effort in researching about alternatives, learning costs that involve time and effort in learning how to use a new product, and setup costs that involve time and effort in setting up a product for the initial use. The second category is financial switching costs that are related to the monetary losses. The financial switching costs consist of two components: benefit loss costs that refer to the accumulating benefits and progressing discounts if consumer stays with a single provider and monetary loss costs that refer to one time deposit fee that is incurred when consumer switches to a new provider. The third category is relational switching costs that represent psychological or emotional challenges resulting from terminating bonds. The relational switching costs include personal relationship loss costs that refer to the loss of contact with the employees from the previous business firm and brand relationship loss costs that refer to the loss
of identity because brands are associated with personal identity. The empirical study has found that the financial switching costs are least effective in retaining the customers while the procedural and relational costs are the most effective.

Switching costs have also been specifically examined for the information technology platforms. In our study we mainly follow Chen and Hitt [5] classification of switching costs for platforms consisting of (1) search costs, (2) contractual costs, (3) learning costs, and (4) complementary investments. Additionally, we will include (5) brand relationship costs to this categorization.

The first component of the switching cost, search cost [5], is also referred to as “pre-switching search costs” [12]. Search cost is defined as time and effort spent in researching about various alternatives prior to purchasing decision. Therefore, in mobile platform context search costs involve investments on identifying possible alternative mobile platforms, gathering relevant information about those alternatives and ultimately selecting one of the alternatives to which an individual decides to switch.

The second component is contractual costs [5,15]. Contractual costs occur while terminating a relationship with one provider and starting a new relationship with another provider. These costs may involve loss of potential monetary benefits such as renunciation of a service provider loyalty program, which may occur in product bundles of mobile platform and mobile network provider service. This cost can be also likened with the lost performance cost [12] and financial cost [4]. Additionally, also actual monetary costs may occur in the mobile platform bundles through termination fees of valid and uncompleted service contracts [5,15].

The third component of the switching cost is the learning costs [4,5,12,15]. Learning costs refer to time and effort spent on acquiring required knowledge and skills to use newly acquired product or service. In mobile platform context this refers to learning to use the new operating platform and certain necessary platform dependent applications that may differ from the previous platform.

The fourth component of the switching cost is complementary investments [5]. Burnham et al. [4] mention that the higher the breadth of user, number of complementary products or services that can be used with the core product, the higher is user’s perception on the switching costs. Therefore, complementary investments in mobile platform context mean user generated data and complementary services or products purchased that can only be used together with the core product. Attachment to the complementary investments discourages an individual to abandon the incumbent platform.

Fifth switching cost is brand relationship costs. This extension to [5] classification was incorporated to our switching cost categorization because of the brand prevalence in the mobile platform market. For example, success of Apple products in the mobile platform market has been partly attributed to Apple’s status as a premium brand as well as overall one of the leading brands in the world. The brand relationship costs are outlined by Burnham et al. [4], but also mentioned under emotional and psychological costs by Fornell [9]. Negative experience with the brand is a critical factor in influencing perception of the switching costs [18] while uncertainty over unfamiliar brands may have affect through uncertainty cost [12]. Therefore, brand relationship costs are going to be measured by emotional attachments that will be lost when switching to a different brand.

Table 1. Operationalization of switching costs to the context of mobile platforms

<table>
<thead>
<tr>
<th>Type</th>
<th>Definition</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Search costs</td>
<td>Time and effort spent in identifying suitable alternatives, relevant information and making decision among the alternatives.</td>
<td>[5,12]</td>
</tr>
<tr>
<td>Contractual costs</td>
<td>Suffering monetary fees related to the termination of the existing contracts and cost required to initiate a new one.</td>
<td>[4,5,12,15]</td>
</tr>
<tr>
<td>Learning costs</td>
<td>Cognitive or time duration challenges related to adapting to a mobile platform</td>
<td>[4,5,12,15]</td>
</tr>
<tr>
<td>Complementary investments</td>
<td>Time and monetary effort to retrieve or lose altogether paid applications, generated data or platform specific assets such as complementary products and services</td>
<td>[4,5]</td>
</tr>
<tr>
<td>Brand relationship costs</td>
<td>Psychological and emotional effects related to switching a brand</td>
<td>[4,9]</td>
</tr>
</tbody>
</table>

2.2. Network effects in mobile platforms

Multiple authors emphasize the importance of network effects that are required for the adoption of the platform [3,5,21]. The network effects are created when users are seeking compatibility with the other users [8]. The technology compatibility within different devices can be translated into external network effects that lead to positive externalities between users [19]. For instance, Apple is offering tablets, computers and smartphones to increase external network effects around its Macintosh platform. These platforms can generate greater external network effects as part of a larger ecosystem that generally consists of several business entities: mobile phone manufacturers, mobile platform providers, mobile network operators and mobile application providers.

The theory of network effects outlines two types of network effects: same side network effects and cross side network effects [7]. These network effects are portrayed in an example of a two-sided platform in which there are users on one side and developers on the other. In this case the developers are principally third-party application developer who can be viewed as complementors and considered as an integral part of the platforms [6]. The same side network effects describe an effect on users if more users join; a large amount of users will create greater compatibility among the users that will generate positive same side effects.

The cross network effects describe an effect on users if more developers join the platform. Similarly, the effect is positive as larger base of developers enhance the service level through increased amount of supplementary mobile applications. Additionally, successful collaboration of mobile platform providers and the complementors can also increase innovation related to the applications [11]. Purchasing via smartphones is increasing by 50% on average each year [3]. This impacts the retailing experience and gives rise to the “app economy”. Applications that are available for smartphones can play a major role in selecting platforms, thus signifying the importance of the cross side network effects.

The value derived from the network effects is not only dependent on the size of the network [1]. Other factors such as transaction feasibility, network ties and roles of network members can also affect to the network effects as well as the selection of the mobile platform. For example, transaction feasibility can limit compatibility with other users by making transactions with certain users infeasible. Platform providers can use transaction feasibility as a strategy to increase switching costs for users and create a “lock-in” in which user find it almost impossible to switch to another platform [14]. An example in mobile platform context is mobile version Microsoft Office products which are only available for Microsoft mobile platform, therefore creating a cross side “lock-in” effect for users requiring Microsoft Office.

Network ties and roles can affect mobile platform decisions through same side network effects. The different network roles and ties influence from where an individual can draw relevant information for the platform decision. In an extreme case some members may assume a role of gatekeeper who can basically make these platform decisions on behalf of other members within a certain network subgroup. For example an organizational policy or a family head with financial and technological decision control can enforce utilization of a certain platform in order to ensure high level of compatibility among the members of that particular network subgroup.

In summary, we posit that mobile platform switching decisions are affected by network effects. The same side network effects are present through feedback given by a close social circle such as family and colleagues of an individual. In an extreme case someone in this social circle may arise in a role of a gatekeeper to dictate the platform selection decision altogether. Furthermore, the cross side network effects have an influence to switching decision through application availability. The effect is not just expected through the amount of different applications available but also through some specific applications that can create a key barrier for switching.

### Table 1. Operationalization of network effects to the context of mobile platforms

<table>
<thead>
<tr>
<th>Type</th>
<th>Definition</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Same side network effects</td>
<td>Important feedback from friends, family or colleagues Presence of the gate keepers</td>
<td>[1,7]</td>
</tr>
<tr>
<td>Cross side network effects</td>
<td>Importance of the total number of available application Importance of the specific applications</td>
<td>[1,7]</td>
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3. Methodology

To find out about how switching costs and network effects influence user behavior in different consumer groups, this study uses focus group method. Focus group method has been considered as an effective approach to throw light on consumer behavior [20]. The key benefit facilitated discussion
in focus groups is an open and constructive participant interaction. An informal and relaxed atmosphere enables participants to express their opinions candidly revealing new ideas in the process [16,17]. In addition, pre-selection of participants enables formation of homogenous groups, which further benefits participant interaction. Therefore, advantages such as greater exchange of information compared to individual interviews, triggered reactions from other participants giving in-depth perspectives, aggregated excitement within the group leading to more elaborate responses, increased security about sharing opinions, increased information accuracy through spontaneous and natural responses, as well as elaboration and co-development of unique ideas through group discussion [16,17].

Focus groups may also have some disadvantages such as possibilities of moderation, messiness, misrepresentation of views, meeting problems and misjudgment. However, focus groups can prove to be a very effective tool for evaluating participant perceptions if the data collecting is managed coherently. Therefore, this study applies guidelines suggested by Malhotra and Birks [17] and especially their four stage qualitative data analysis process.

The four stage qualitative data analysis consists of (1) data assembly which involves data recording in group interviews; (2) data reduction which includes data transcribing, coding, code categorization and identification of irrelevant data; (3) data display which incorporates transformation of raw data into more concise and visual presentation; and (4) data verification which contains data authentication with additional literary sources. In this study, the coding and categorization was based upon theoretical constructs presented in the previous section: search costs, contractual costs, learning costs, complementary investments, brand relationship costs, same side network effects and opposite side network effects. Additionally, the references to “lock-in” effect were coded at both platform and cloud level.

For data collection we utilized multiple-category design [16], which consisted of four consumer focus groups: university students, soccer athletes, researchers and IT professionals. We carefully selected the focus group participants so that the each focus group represents a distinct demographically homogeneous user group. Across the focus group however, we wanted to maximize the intergroup heterogeneity. The group sizes ranged from 4-6 participants and took place in late summer 2013. The interviews ranged from 1 to 1.5 hours in which the participants were asked to fill out a questionnaire and discuss open-ended questions. The questionnaires were utilized as background check to single out current ownership of relevant communication devices and services. The open-ended questions were derived from the framework presented in the previous section and targeted specifically to unravel costs hindering switching from a mobile platform to another.

4. Empirical study

4.1. Overview of the focus groups

The first focus group was university student group that consisted of 4 participants of ages 23 and 24. They were chosen to represent digital natives in our study. The respondents had different phone brands: Nokia, Samsung, HTC and Apple. Three respondents have had multi-homing experience with multiple mobile devices. One of the respondents has been using two devices for work and personal use. Two other respondents have been using two phones previously when living abroad in order to simultaneously use two SIM cards, one for making local phones and another to call to the home country. Only one of the respondents had a tablet and three other respondents clearly stated that they did not understand the importance of a tablet. Furthermore, one respondent belonged to the Apple ecosystem and had purchased all the devices and services such as the iPhone, iPad, iCloud and Mountain Lion based desktop and laptop computers.

The second focus group consisted of six female soccer athletes. They represent a tight group communicating every day actively to coordinate their joint activities. The age of the respondents ranged from 18 to 41 years. Some of the respondents were multi-homing with more than one phone. Examples of the smartphones that were present are: iPhones, Samsung Galaxy S2, Nokia C2 and Nokia Lumia 720. Only one of the respondents had an iPad. Three respondents were particular about using Apple’s iOS ecosystem by using iCloud, iPad, iPhone and iMac. General use for smartphone among soccer athletes was Facebook, Spotify, calling and messaging. One of the respondents was using two mobiles from different platforms, Symbian and iOS. The reason was because the respondent had bought iPhone in the home country and had been unable to change network provider when the respondent had moved abroad and the phone had been SIM locked. As a consequence, the respondent used the iPhone only to browse when it was connected to the internet and Nokia phone as a calling device with a local network provider’s SIM card. However, the same respondent stated that if iPhone had been unlocked, then she
would only use the iPhone. The consensus within the focus group was that nobody wanted to use more than one smartphone, which indicated a strong tendency toward mono-homing for mobile devices. Majority of soccer athletes used between 5-15 applications, which were mostly related to communication and networking, for example Facebook, Instagram and WhatsApp. Only two respondents had any gaming applications on their smartphones.

In the third focus group there were four male researchers from an educational institution. They were chosen to represent people with high knowledge on the possibilities offered by digital services. The respondent’s ages were between 26 and 59 and they were using the following smartphones: Lumia 820, Nokia E72, iPhone 5 and Samsung Galaxy S3. None of the respondents was using two phones simultaneously. Primary purpose of the phones were calling, e-mailing, listening to music, navigation and using calendar for schedule planning. One of the respondents had an iPad for personal use. There were no members that were particular about using any ecosystem. Majority of applications belonged to communication and navigation and there were no gaming applications.

In the fourth focus group, there were 4 participants who were IT experts. They were chosen to represent people with extremely high technical knowledge on different platforms. The participant ages ranged from 27-43 years and the following smartphones were used by them: iPhone 4, iPhone 5 and Galaxy SIII. One respondent used two smartphones simultaneously: one was for work and the other for private use. Participants used their smartphones for calling, texting, WhatsApp, music and camera. Two participants had an iPad while others did not perceive any usefulness for a tablet. Only one respondent deemed Apple ecosystem to be important. Majority of applications that the respondents had installed on their phones belonged to communication and entertainment categories and few respondents had sports tracking applications. Only one respondent had gaming applications.

4.2. Findings on switching costs

4.2.1. Search costs. It appears that across all the focus groups, respondents either conducted their own research or got feedback from family, friends or work colleagues. Some respondents in soccer athletes, researchers and IT professionals’ focus groups have stated that in the past before the release of smartphones, store’s seller managed to persuade them to change their mind on a phone model as long as it was from the brand they were initially considering. However, presently the respondents said that they were already aware of the exact brand and phone model they wanted to buy at the time of purchase. When asked if the store seller influenced their buying decisions, the respondents from the soccer athletes and researchers focus groups said:

“...last time I bought phone, 6 years ago, it was a damn Nokia. So, it [seller influence] didn’t matter... because I ordered [the phone] online. So, I might consult internet before I asked to compare if I had three or four phones in mind.” (focus group 3)

“Well, it [seller influencing switching] happened before iPhone. It happened when I was using Nokia. I had another phone in mind and... he [seller] just told all this good stuff about another model and then sold me another Nokia... [which was] kind of the same but... better,... more expensive one.” (focus group 2)

In focus group 4, one of the sellers tried to pursue the respondent to reconsider buying a Nokia phone and instead buy the Android phone, which resulted in a negative reaction from the respondent. This indicates that the search costs are quite low because smartphone users can easily make decisions for themselves among different alternatives without any specialized help.

“I went to buy 520 Lumia for my mother as a birthday present and... there was a guy who asked whether I was certain about my choice... I compared 620 and 520, and I listed all differences that they have... he should have been aware that I knew exactly what I was going to buy, and then he asked: ‘well, have you looked at this Samsung trend... it’s an Android device...’ He started listing all the reasons why Android would be better and I think that was very dangerous road... because of these sentimental reasons as well and in Finland it would be quite dangerous... to start promoting Samsung instead of Nokia if the customer has already made up his mind.” (focus group 4)

4.2.2. Contractual costs. Contractual costs refer to the cost of switching or terminating contract with an existing mobile platform. In all four focus groups, there were respondents that purchased a smartphone as part of a subscription package. As a result, if the respondent decided to switch during the validity of the subscription contract, he would incur contractual costs for the smartphone that he would not be using anymore. Therefore, all the respondents that purchased a smartphone with a contract from a network provider did not switch during the validity of the contract. Furthermore, multiple respondents acquired their current mobile phones from their workplace. In Finland, usually employers pay for their employees’ work-phone bill and pre-select the

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network providers. The mobile phone sets that accompany the subscription package offered by these selected network providers are limited. Due to tendency of mono-homing for mobile phones, such workplace offers tend to limit the selection of mobile phones for employees in order to lower the contractual costs.

“When I got my iPhone... you had to take combination of the package or you would have to buy it all at the same time it would not have been any cheaper and since I did not have extra 500 dollars on my account I just bought package...” (focus group 2)

“Yes, operator is fixed but I think in Finland they provide you with same services so differences might be in countryside and are you able to use 4g or 3g... I mean more or less they are providing the same [service]” (focus group 3)

### 4.2.3. Learning costs

Learning costs refer to the time and effort to get used to the new smartphone’s operating system. The general consensus is that it took between 1-3 days to get used to the basic features, but it took much longer to learn more advanced features and some respondents mentioned that they were still learning after having smartphone for several months.

“I switched from iPhone to Android and it took me 2 days probably but I was thinking it would take more but it only took 2 days...” (focus group 1)

“Is it so that old Samsung models had Android? I had something like really old like one of the first smartphone models before I got this... for me it took a while because at first I thought that I actually don’t even need all the qualities but then when I got into it I really got into it” (focus group 4)

However, in the researcher’s focus group the respondents said that the learning costs are getting lower after the initial switch. The user interfaces, applications and other utilities for different mobile platforms are getting similar and it is becoming easier to get used to the new operating systems. It appears that if current smartphones are viewed as commodities, only radical innovations can lead to high learning costs. The current convergence of user interfaces appears to be lowering learning costs.

“In our family we have two Samsung Androids and... in the beginning you needed an extra course because you didn’t know how to use it. It’s a bit different, but after you done it few times it’s quite similar. I think that, for example, this Apple’s iPad and Android systems are quite similar... I haven’t used this iPhone, but I suppose it’s quite close and the logic is similar.” (focus group 3)

### 4.2.4. Complementary investments

Complementary investments refer to the specific assets that work on a particular platform. It is useful to differentiate complementary investments into several categories. These categories consist of: native data, generated data and value-added services. Native data can be paid-applications that are bought for specific platform and are non-transferable. Generated data can be the new data that user has generated by the use of mobile phone, for example pictures or document files that can generally be transferable through the use of “converters”. Value-added services refer to extra technological capabilities resulting from synergies between different devices and are platform specific, for example easier transfer of data between iOS through iCloud. As the user acquires more devices from the same mobile platform, these value-added services will be greater in number thereby increasing the switching cost for any one particular device.

To begin with, multiple participants across the focus groups did not manage to successfully transfer data into their new phones. There were participants who were successful at partially transferring some information, such as contacts using SIM cards or transferring photographs through cloud services or via computer using a cable. In this case, cloud services, SIM cards or other devices that can transfer information can be viewed as converters and can reduce complementary switching costs. Therefore, switching costs of complementary investments varied highly between individuals due to usability issues and depended on the respondents’ knowledge of using converters. Some of the responses from the respondents regarding transferring data to the new devices are listed below.

“I think it is going to be a big trouble [to switch], because for example all the contacts. I don’t know how to sync to Android. If I want to switch to Android, all email which I have on my iPhone, I don’t know how to change to Android. For example, all my calendar [items], I don’t know how to change [them]... all apps, which I have on my iPhone, I have to search one by one on Android to download... I don’t know [how] to like transfer my data from iPhone to Android. I don’t know if there is a way...” (focus group 1)

In addition, not a single respondent mentioned that they perceived any benefits from having all the devices belonging to Android or Windows platform. Only Apple users preferred to have multiple devices from the Apple ecosystem because there are specific derived technical advantages, for example better synchronization between devices for transferring information. Therefore, respondents that were loyal
to the Apple ecosystem stated they would experience high complementary investments switching costs.

"...I have my Mac... I have my iPad and iPhone and all of them are like an ecosystem, so they all sync together with iCloud so if I use all the devices they update." (focus group 1)

“Now we have all the stuff from the same thing [ecosystem]. You can just put iPod or iPhone or anything into the same deck and we have decks in every room. It’s just so easy.” (focus group 2)

“...I think there is a benefit of using Apple products. For example, when you have iPhone and... iPad there is a huge benefit of having Apple TV as well, because then you get to automatically view the pictures that you have. For example, in your photo stream you can stream live video and pictures from your iPhone to the Apple TV.” (focus group 4)

4.3.1. Same side network effects. The same side network effects imply if a large platform user base is important or any particular group of people influenced the user’s adoption of a platform. For majority of respondents it appeared that their close social circle provided them with recommendations about particular devices. However, for large proportion of respondents, the final decision was based on their individual research and previous feedback from other users, who were not necessarily part of their close social circle. When asked who was primarily responsible for their purchasing decision, overwhelming majority of respondents answered that it was they themselves who made the final decision irrespective of what their social circle was using, but recommendations and external sources had played a major role in the decision making. It appears that the respondents who received positive feedback from their social circle selected an Apple product.

“Probably friends as well... a lot of my friends have iMacs... when I see them, they never have problems with a computer and I would always had problems with mine... I just eventually bought myself a Mac and haven’t got problems since then so... definitely friends” (focus group 2)

“You talk to your friends and you hear things, but I wouldn’t say that I ask a person or a group and then they would say that you are stupid if don’t you buy this... it’s kind of like... you accumulate information...” (focus group 3)

Nevertheless, there were respondents whose final decision was based on family members. In other words, a family member was a gatekeeper for purchase of the mobile phone.

“My boyfriend... he makes all the choices in our family, and any IT stuff, I have no say in that... whatever he says is convenient...” (focus group 2)

“My dad just does research and then just tells me. So, whatever he tells me, I just do it.” (focus group 2)

In the second focus group despite athletes belonging to the same soccer team, there were no common applications between the group except Facebook and WhatsApp. Specifically, there was not a single common soccer related application that all the respondents used on their smartphones but, majority of respondents in the soccer athlete’s focus group had at least one application related to football.

In summary, same side network effects were primarily exhibited in the form of recommendations from word-of mouth and other third sources from the...
internet. It is possible that the applications that are operated on the smartphones have cross-platform functionality so the users can still connect to each other irrespective of whether they are using the same mobile platforms. This indicates that the total number of users using a mobile platform is not important for any single user. On the other hand, it can be important if members from the same household are using devices from a specific platform. The reason is that family members can act as gatekeepers or simply have greater synchronization between their devices.

4.3.2. Cross side network effects. The presence of the cross side network effects depended on whether the number of total available applications is a key factor for users in using a specific mobile platform. In addition, it was important to examine whether there are any specific applications that attract users to mobile platform. Generally, respondents stated that there were no specific applications that had made them select their platforms, however total number of available applications for a platform was an important decisive factor.

“It’s annoying when I can’t play candy crush when other people can but I don’t think it’s a major reason to choose a phone.” (focus group 2)

“...it depends... if it’s like a critical mass of applications I want to use, then yes, but then for example, lots of people say that... if you don’t have Instagram on Windows phone, then it’s a big minus. But I am not using [Instagram]. So, I pretty much don’t care if it’s not there... I got like a lot of apps that I want to use and they are not there then yes... I would not switch for example for one or two apps because I can find a substitute, probably, or just be without it [the app].” (focus group 3)

However, one of the respondents stated that temporarily he had been unable to switch to another platform because of an application was not available.

“I was playing Clash of Clans... actually I... got really hooked into that in a week or two... at some point I even thought that couldn’t switch... to Lumia because they don’t have it...” (focus group 4)

5. Discussion and Conclusions

The purpose of this study was to examine strength of switching costs and the network effects as well as the interplay of these concepts in the context of mobile platforms. We find that firstly search costs are low because users do not experience cognitive challenges or spend considerable amount of time when selecting a mobile platform. In addition, users may rely on a more feeling-based approach when choosing among different mobile platforms. Secondly, users only switch after the contract with the network provider has already expired. Therefore, transaction costs in relation to contract length can be estimated high creating a high switching barrier during the contract period. However, the repercussions of transaction costs may be different depending on the length of the contract obligations. Thirdly, learning costs are only low to intermediate because it generally takes a short period of time for users to learn about the basic features of a new platform. Due to the standardization of the user interface the general experience with a smartphone is largely transferable to other platforms. However, users learn new features of their smartphones on continuous basis. Fourthly, the complementary investments increase over time due to accumulation of paid applications, generated data through use, value added services and greater compatibility with the users due to positive same side network effects. Users have different knowledge about using converters to transfer data to a new mobile platform; therefore, complementary investments are even higher for less savvy IT users. We find the effect of complementary investments to be the strongest of the switching costs. Lastly, brand relationships costs are relevant because the users are affected by marketing, design of the products and company’s country of origin that can build a more personal connection to the brand by reflecting individual identity.

Network effects are present both in the pre-adoption and post-adoption phases. The cross side network effects appear to be crucial in sustaining the satisfaction in the platform during the post-adoption phase. Users are dissatisfied when the multiple popular applications are unavailable for the adopted platform that can trigger switching to an alternative platform. In contrast, same side network effects are more important in pre-adoption phase. During the pre-adoption phase, recommendations from the social circle can influence user’s adoption decision. Furthermore, there is evidence that if one member of the household uses a specific mobile platform then the other members will adopt the same platform because of a greater compatibility between devices.

Our study indicates that it is not the mobile platform alone, but a combination of the mobile platform, installed base of applications and inter-device integration that creates high switching barriers. Furthermore, if integration is built around manufacturers cloud services, switching cost come high. In contrary, using independent cloud services, or company/community level integration mechanisms switching cost may stay surprisingly low. Based on our findings it seems that sunk cost effect plays a role
also in switching mobile platform or actually sticking into the current one. If the functionality offered by another alternative is not superior, people are reluctant to switch. This indicates that learning and complementary investments are deemed to be sunk cost and people are willing to continue with the current course of action.

5.1. Limitations and further research

This study was conducted in Finland offering rather special environment to study digital ecosystems. Digitalization and use of new technologies, including mobile phones, is already deeply diffused to the whole society. The number of mobile phones per capita is among the highest in the world. In addition, Nokia has been long a leading brand in its home basis, but recently main competitors have been outperforming in the market. However, Nokia still holds its special place in the hearts of many Finns. Nonetheless, these unique circumstances did not emerge as an important issue in the focus group interviews.

This study was based on four focus groups. It is obvious that we could not cover all possible user groups, but more or less, directed our research to those we found most interesting in respect to their behavior. In any case, focus groups do not allow any generalizations, but merely give weak signals of possible trends. Therefore our findings should be developed further and taken into a full-scale empirical investigation.

We have studied what explains why and how people change their digital ecosystems. We have to remind the reader that actually these ecosystems are still in their early phases and during the data collection they were changing all the time. This is a very challenging phenomenon to be captured in any study, and actually it was often difficult to know what version of the technology and services the respondents were referring to.

Despite of these limitations, we believe our study can offer some insights to how and why consumers respond. The study, and actually it was often difficult to know what version of the technology and services the respondents were referring to.

6. References