LUND UNIVERSITY

School of Economics and Management

Department of Business Administration

FEKN90

Business Administration-

Degree Project Master of Science in Business and Economics

Spring term of 2013

Mobile Applications Industry

- *Industry Dynamics and Business Models*

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Foreword

For 20 weeks we have been working on this Master Thesis in Business Strategy at Lund University, School of Economics and Management.

This master thesis is part of a project initiated by Vision Mobile, through CEO Andreas Constantinou, in cooperation with Lund University School of Economics and Management. Five groups have been studying the area of "profit migration in telecom." The intention is to generate five separate master theses that together cover the whole value chain of the telecom industry. These findings will eventually be published as a book where each thesis covers one part of the value chain. The value chain is divided into five different parts; Network operators, Infrastructure providers, Handset OEMs, Applications, Developer Business to Business Ecosystem. Our thesis is devoted to the Applications Industry.

We are grateful for the valuable guidance and support from many people around us. Andreas Constantinou has been very helpful in contributing with in-depth industry expertise. Our mentors Fredrik Häglund and Magnus Johansson have been of great support during this time, providing valuable insights and guidance in the writing process.

Lund, May 2013

Martina Fredholm Martin Gunnarsson

Abstract

Title: Mobile Applications Industry – Industry Dynamics and Business Models

Submitting date: 15/07/2013

Course: Master Thesis in Business Administration, MSc in Business Strategy

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Key words: mobile application, business models, platforms, ecosystem, network effects

Purpose: The purpose of this thesis is two-folded:

- To break down and explain the growth and development of the mobile applications industry.

- To find out if the success of an application can be explained by a connection between:
  1. Business model and application sector affiliation and; 2. Business model and geographic market targeted

Methodology: We have performed an exploratory case study covering different application business models depicting the relationship between the highest grossing applications. To understand the dynamics and development of the industry we have used different theories which we also have based our framework on. In order to conduct a well reinforced analysis we have collected empirical material and secondary data.

Theoretical perspectives: Business models, Disruptive innovation, Network effects, Ecosystems, Platforms

Conclusion We have found that there are a connection between high grossing applications and business models. The “Free in-app” business model is the most common business model over all sectors and geographic markets. However, business models associated with high grossing applications do differ depending on application sector affiliation. We also found that, although to a lesser extent, that business models for high grossing applications differ depending on geographic market targeted. Nevertheless, why certain business models are more successful for certain geographic markets needs to be studied further.

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1.0 Introduction

The introduction will present a background to the research area, in order to provide a relevant context for our study. The background will then culminate in a discussion of the research problem, followed by the papers specific research question and purpose.

1.1 Background

Mobile telecom is the most pervasive technology there is with about 6.8 billion subscribers globally (96 % of world population) (ICT Data and Statistics Division, 2013). It is more common to have a mobile subscription than having access to typical essential needs such as electricity and safe drinking water (D. Vision Mobile, 2012). It is further estimated that 1 in 7 of the world's population owned a smartphone in the 3rd quarter of 2012 (approx. 1 billion) and it is forecasted that the next billion will be achieved in less than three years, by 2015 (BusinessWire , 2012). Tablet penetration is soaring as well, estimated to grow 69.8 % during 2013 (B. Lomas, 2013). The number of smart devices is obviously increasing, hence, paving the way for mobile applications.

The choices that consumers and businesses make, drives and is driven by, the technological progress of both applications and devices (Cisco, 2010). Smartphones are not most commonly used for making phone calls anymore but for browsing the internet, social networks, playing games and more. Over 800 000 applications are available in the biggest app store around, the Apple App Store. "There is an app for that," in the words of Apple's advertising. The value of these applications has partly been extracted from previously existing industries, that is, smart devices allow features from many devices to be bundled into one (D. Vision Mobile, 2012). Most importantly however, new value has been created through novel solutions for a myriad of problems, previously not possible. For instance you can stream video through apps on your smartphone (D. Apple, 2013), or use an app as a remote control for turning on the heat in your car (Volvo Car Corporation, 2013) or turning on the lights in your house (Vattenfall AB, 2013).

In order to understand how value is created and captured in the mobile applications industry, and which business models that are most commonly used; we find it essential to initially educate the reader on how the mobile applications industry came into existence.

At the turn of the millennium, traditional handset manufacturers and IT leaders rushed to exploit a digital convergence between voice and internet capabilities. The handset makers developed increasingly sophisticated Internet capabilities whereas IT leaders developed voice capabilities. This was a crucial point in time for the evolution that led to the smartphones we have today (Steinbock, 2008).

However, the origin of the smartphone can be dated as far back as the release of the Newton PDA (Personal Digital Assistant) in 1992 by Apple computers. It was pre-loaded with various software applications such as Works word processor, Newton Internet Enabler as well as 3rd party applications. However, it experienced major problems with hand-writing recognition software and it did not experience any success in the consumer markets. Further development of the Newton PDA was soon discontinued, as was Apple's subsequent PDA models, MessagePad 2100 and eMate 300 (Hormby, 2006).

In 1994, the problem with hand-writing recognition was solved by Jeff Hawkins of Palm Inc. when inventing the Graffiti text-entry method. The PalmPilot was released in 1996 and became the most rapidly adopted computing product ever introduced (Palm Infocenter, 2006).

At this time applications on feature phones existed most commonly in the format of primitive calculators and arcade games. Hence, making calls and sending text messages were still the core functions of the mobile phone. Once applications were introduced, the interest increased and customers began to push for more features and more games. Handset manufacturers however, did not have the motivation or the resources to build every application users wanted. They needed some way to provide a portal for entertainment and information services without allowing direct access to the handset. The internet on mobile devices was now introduced through the WAP (Wireless Application Protocol) function. The WAP solution was great for mobile operators. They could provide a custom WAP portal directing their subscribers to the content they wanted to provide and wallow in high data charges associated with browsing. Commercializing WAP applications was however difficult and there was no billing function incorporated in the app. The developers could not tailor the user's experience and the result was a mediocre and not very compelling experience for anyone involved (Clark, u.d.). Regardless, a more dynamic environment for users was soon to come.

In 2003 RIM (Research In Motion) released its first Blackberry, allowing real-time push-email communications on wireless devices. RIM dominated the market for smartphones with its subsequent Blackberry models up until the release of the iPhone in 2007. The dominating reason for why the blackberry did not gain momentum as the iPhone later did, was the business-centric strategy of RIM. Apple however, marketed their smartphone to the consumer markets and reaped the benefits of economies of scale. Additionally, mobile applications for Blackberry devices were not made easily available until 2009 with the launch of the BlackBerry App World application distribution service, one year later then the launch of Apple's App Store (Cha, 2009).

The telecom industry has gone through many dramatic changes in the past five years. Before the introduction of the iPhone in 2007, the industry, mainly though network operators, provided for basic voice, text messaging and VASs (value added services). The value chains were fairly integrated and innovation was protected to avoid being leaked to competitors and other parties. The operators treated their platforms as walled gardens, restricting non-approved applications and other content (C. Vision Mobile, 2012). The mindshare put into mobile application development did not really take off until Apple rewrote the value chains, making their platform open for anyone to contribute.

In 2006, telecom CEOs focused much more on new product development than on business model innovation (IBM, 2006). In 2007, Apple proved that a focus on business model innovation was just as important as product development to gain competitive advantage. They moved the focus from targeting business segments with smartphones and targeted private consumer instead. This market was huge and had not been focus of attention earlier why the new focus along with the introduction of the iPhone and the Apple App Store, data connectivity and OTT-services (over the top) became the new drivers of growth for the telecom industry. Further, profits were dispersed to include a new sector in the telecom industry, the third party developers. When opening up for third party developers to contribute with knowledge and innovation the supply increased and diversified, this made the Apple app store more attractive. The cost for developing apps for Apple is a share of the profits. Apple thus has an extra revenue source from 3rd party developers. All profits are split 30/70 where Apple get 30% of the earnings from the applications.

This form of value migration, where profits are moving from one part of an industry to another, has historically been displayed in industries characterized by disruptive technologies frequently changing the industry structure. The mobile applications industry has taken the same path of modularity as the personal computer industry once did. E.g. handsets used to be closed, offering few software adjustments for the individual user. Today however, the possibilities of smartphones offer endless opportunities for the user to personalize the handset and for developers to contribute with solutions in order to meet the individual needs of each user. This is a result of independent developers' ability to extract value from the formerly integrated value chains as participants in a larger ecosystem of stakeholders.

1.2 Problem Discussion

The iPhone revolutionized the telecom industry in 2007 by shifting power from the once so influential collaborations between handset manufacturers and network operators to the new ecosystems surrounding Apple, Google, Microsoft and others. However, which the determining factors were that paved the way for the disruption of the telecom industry and the subsequent rise of the mobile applications industry has not yet been determined. We find this eminent to examine in so that the reader can understand how the mobile application sector came into existence and subsequently in which context the mobile application business models compete.

There are numerous business models with differing strategies for value creation, distribution and value capture in the applications industry. Further, the revenues made in the application industry are concentrated to a small percentage of developers; "4 % of the developers make 80 % of the revenues" (Constantinou, 2013). Despite this, it has not yet been explained, in theory or otherwise, why these revenues are concentrated to such a small group of developers. Hence, what we find missing in the literature are studies investigating if the concentrated revenues can be explained by the choice of application business model. Moreover, the vast amount of applications available is developed to meet many different needs, and the applications are hence engaged with in many different ways by the user. Consequently, we suspect there might be reason to believe that there are business models more or less appropriate for a certain application in order to capture value from the user. What we are going to study is whether there are any correlations between application sector affiliation and successful business models as well as if there are any correlations between business models and geographical markets.

Greater knowledge about how to design business models for applications, given a certain sector or geographical market, might increase the effectiveness as well as the potential revenue for any application developer. Moreover, it is important to find best practice for business models, especially on nascent markets such as the application market, in order to increase market efficiency and effectiveness. In addition, the dynamics of the application industry changes very quickly and is thus in need of relevant business models appropriate for current conditions. Subsequently, from a holistic point of view, well-functioning markets contribute to the growth of the global economy which obviously is in everyone's interest.

1.3 Problem Definition

A number of business models exist in parallel for very similar products. Simultaneously, revenues are concentrated to a very small group of developers. However, we do not know whether the small group of high grossing developers shares a common trait of a specific business model and if the business models are specific to application sector and geographic market.

1.4 Purpose

The purpose of this thesis is two-folded:

- To break down and explain the growth and development of the mobile applications industry.

- To find out if the success of an application can be explained by a connection between:
  2. Business model and application sector affiliation and; 2. Business model and geographic market targeted

1.5 Research Question

Do revenues from sales of applications vary dependent on business model in relation to application sector affiliation and geographic market targeted?

1.6 Delimitations

We have collected our data material carefully and with a certain intention of capturing indications for differences between the usage of business models within different sectors and

geographic markets. We are aware of the fact that this study is limited and it can be designed differently. Though we found this framing suitable for our purpose and we are satisfied with the data we have extracted. Further, what the data show is how many of the top 100 grossing applications that have a specific business model. This does not mean that the choice of business model is made strategically by the application developers publishing these applications in every case.

2.0 Method

This chapter is a description of our working process and approach. We will discuss our choices of methods and theories while we simultaneously present critique to our chosen methodology.

2.1 Starting Point

This master thesis is a part of a project initiated by Vision Mobile and Andreas Constantinou in cooperation with Lund University School of Economics and Management. Five groups are studying the area of "profit migration in telecom." The intention is to generate five separate master theses that together cover the whole value chain in the telecom industry. These findings will eventually be published as a book where each thesis covers one part of the value chain. The value chain is divided into five different parts; Network operators, Infrastructure providers, Handset OEMs, Applications, Developer Business to Business Ecosystem. Our thesis is devoted to the Applications Industry.

2.2 Overall Approach

To widen our knowledge about the applications industry we started by reading relevant business journals published by industry analysts as well as consulting reports from respected firms in the industry of mobile technology. Furthermore, we got familiar with websites and blogs where applications and mobile were in focus. We found that this provided us with a fair picture of the current dynamics and trends of the industry.

Additionally we examined and collected scientific articles which we later used to create a relevant theoretical framework. We further converted our theoretical framework into an operationalized table with measures better suited for the context of our study.

Further we collected secondary data to create a data material covering the top 100 most grossing applications. We found applicable data for six sectors in five countries for the largest platforms iOS and Android. The discovered data was then extracted into spreadsheets and diagrams. We have conducted interviews to get the opinions and insights from companies developing applications.

2.3 Research Method

When deciding upon how to conduct the research of the thesis, we chose a method which was in line with our purpose and the factors determining the context for the study. The

applications industry is characterized by a very fast-moving and dynamic environment. This means many apparent factors need to be taken into consideration. Given these conditions the research method has to be flexible and possible to apply in diverse contexts. If examining a purpose of descriptive, explanatory or exploratory nature case studies are favorable to use. Case studies can be used to describe a situation or to explain why different events occur by test explanations (Yin, 1981). The core of our case study is to investigate the characteristics of business models in different sectors, why the focus of the study is to answer the questions of how the business models are designed to create value and how they intend to capture value.

According to Bryman and Bell (2013), the most common ways of approaching the research within the fields of social sciences are; quantitative method and qualitative method. Qualitative research is suggested for situations where the technique of collecting data varies as well as where the type of data differs why we found a qualitative case study to be the most suitable research method for our study. The basis for analysis, our data material, will be numeric why it can be argued to have elements of quantitative research since it stresses the quantification of information and data. Quantitative research has a deductive perspective where testing of theories is the main focus, the qualitative research on the other hand put focus on words rather than quantification, during collection and analysis. The qualitative research strategy further emphasizes an inductive relationship between theory and research, with a focus on theory generation (Bryman & Bell, 2013). Due to the nature of our data and chosen theory, we will use a mix of these two perspectives which Bryman & Bell (2013) confirms is possible, especially in the field of business. By testing theories we hope to generate contributions to theory regarding how to design business models in the mobile applications industry where we have identified a lack of relevant up to date literature.

Yin (1981) further argues that the use case studies as a method of research arises when;
"An empirical inquiry must examine a contemporary phenomenon in its real-life context and especially when the boundaries between phenomenon and context are not clearly evident."
The frame of the case study in our thesis is described by Yin (1981) as a multiple-case design where the conclusion will be drawn from a group of cases. Moreover, Eisenhardt (1989) confirms it is possible to extract multiple levels of analysis from a single case study and that the research approach of case studies is especially appropriate in new topic areas. Further, case studies usually combine methods for data collection hence the evidence can be both

qualitative and quantitative (Eisenhardt, 1989). Since we found these conditions to be suitable for the kind of data we have intended to explore, we chose the case study method.

2.3.1 Case Study

When including more than one case in a study it is called a multiple-case design, thus, our study falls into this defined category (Yin, 1981). For a successful study, Yin (1981) argues for explicit information about the design. Accordingly, our intention with the design follows here. The study will investigate different mobile application business models, both how value is created as well as captured, in six different sectors and based on data from five geographical markets. The data are based on applications from Apple's App Store and Google Play. Focus will be directed towards those application sectors smartphone users' spends most time using. According to Flurry Analytics these sectors are; games, entertainment, social networking, utilities, news and productivity (Appendix 6).

We have also included the category "overall" to independently evaluate the findings. Further we chose to look at these categories in five different countries; USA, UK, Japan, Sweden and India. Extracting data from different geographical markets allows us to explore environmental variations (Eisenhardt, 1989). We have developed an analysis tool to better capture the dynamics of our context which is further explained in the theory chapter.

Our cases were chosen to extend emergent theory as well as to fill gaps in existing theories (Eisenhardt, 1989). To ensure that we had up-to-date and trustworthy information, we used the analytics website AppAnnie for sourcing information about the highest grossing applications and their business models. AppAnnie has made the following four distinctions of business models when gathering their statistics; free, free with in-app purchase, paid and paid with in-app purchase. We found this classification appealing because they are easy to understand and analyze. The comprehensive statistic material available was another reason for why we chose these classifications. The full material was collected during one day (4^{th} of April) resulting in a fair data colleting process where no factors changed or affected the material. This procedure also ensures the creditability and dependability of our data collection (Bryman & Bell, 2013). We further extracted the presence of the four business models for each six sectors, in the chosen countries, for the iOS and Android platforms. We counted the frequency of each business model within the top 100 highest grossing applications. We did this in relation to application sectors as well geographical markets. Finally we used our

analysis tool to measure and analyze how value is created and why a certain revenue model was more commonly used in each sector.

2.3.2 Semi-Structured Interviews

To create a relevant base of sources we conducted face-to-face interviews to collect qualitative material for the empirics (Yin, 1981). We have performed three interviews with local companies developing applications and all interviews were conducted with the CEOs of the companies. The CEOs possess great knowledge about the company, and its business, in particular their views on the development processes, business models, value creation and value capture as well as the industry as whole (Bryman & Bell, 2013). We are pleased with the interviews we have performed and we found them rewarding.

We chose to conduct semi-structured interviews. An interview guide was created in order to have a framework of questions that we wanted to discuss and get answered. This since we wanted to keep the possibility to be flexible in what we could ask as well as to ask open questions. By using this interview technique we were able to get opinions from all three companies on the same open questions while also getting insights on other matters that came up during the interviews (Bryman & Bell, 2013). We had the opportunity to meet with all our interviewed CEOs in private which we felt was good for the interaction.

2.4 Data Collection

The two types of data commonly discussed are primary and secondary data. The two are separated by type of source; it is either extracted from already published material, or it is new material, not published before, and collected by us (Bryman & Bell, 2013).

2.4.1 Primary Data

The type of primary data published in our thesis is the information gathered during interviews. We conducted semi-structured interviews which gave flexibility to adjust the order of the questions and a possibility to ask other questions depending on reply and reaction from the respondent (Bryman & Bell, 2013). During all interviews we have recorded the conversation whereby we have the possibility to listen to the material at any time, making sure the interpretations of the respondent are correct.

2.4.2 Secondary Data

The major part of our thesis consists of secondary data, defined as data collected by other researchers or data collected by other institutions or organizations as part of their everyday

businesses activities (Bryman & Bell, 2013). The substance is thus, the information already exists.

In order to familiarize ourselves with the concept of profit migration and the telecom industry we started with a literature review of the empiric field. Lots of the empiric material has been provided by Vision Mobile and teachers involved in the Profit Migration project, which have been a great benefit to us. Additionally we studied reports published by consulting firms in the industry and learned what areas would be suitable and interesting for our study. The voluminous consulting reports distributed invited to an extensive amount of reading which was required in order to gain sufficient and proper knowledge. To further explore the telecom and application industries, reports from different analysts, firms active in the telecom industry, as well as other material produced by recognized industry academics have been studied. As mentioned above, the material processed in this first stage of research included both the telecom industry to get a wide perspective as well as the applications industry to get more specific knowledge.

2.5 Validity and Reliability

Reliability is the question of whether the study conducted can be repeated and generate the same result or if it is dependent on any random or temporary conditions (Bryman & Bell, 2013). Validity is a measure to determine whether the results generated from a study is correlated or not, or if it supports the conclusions made (Bryman & Bell, 2013). If evaluating these measures for our study we find that all the data used in the case study is possible to extract again. The material is available at AppAnnie.com. With support from the framework we have presented and used here, it is possible to carry out the same study. Therefore a repeated case study would generate the same results and the reliability is confirmed.

To further evaluate the study we have chosen additional measures to determine the reliability and validity. We did this because our study is qualitative with quantitative elements. We have therefore considered the measures proposed by Lincoln & Guba (1985) and Guba & Lincoln (1994) (as cited in Bryman & Bell, 2003) which claims trustworthiness and authenticity to be better measures for qualitative studies. Within trustworthiness four parameters have been evaluated; creditability, transferability, dependability and conformability. We have been consequent when conducting the study and the research method described has been followed, whereby we find it to be creditable. The findings of our study can be presented differently

depending on the focus, meaning that all data presented have not been included in our reasoning. Though, since our purpose is to address the most grossing applications, the data have been the focus of the study. Regarding the transferability of our study we believe that it is specific for the context of the applications industry and would be ineffective not to say inappropriate to use in other contexts. The structure may be possible to reuse but the parameters are not applicable. During the working process we have continuously been documenting our progress and methods when collecting data whereby it is possible to follow the progress in detail.

The authenticity should further mirror a fair picture of the study, opinions as well as objects being investigated (Bryman & Bell, 2013). With the review of the research method we believe we have created a full picture of our study as well as the working progress, which is possible to follow from the beginning to the end. We believe the study present a fair picture of our findings whereby the reader can trust the authenticity of the presented material.

To evaluate our interviews we have used trustworthiness and authenticity again as measures. Since the interviews are qualitative these measures are better suited and correspond better with our research method. We find our material gained from the interviews to be trustworthy. This since the interviews conducted where semi-structured with open questions by which we intended to give the respondents possibility and space to answer our questions without being influenced by us or by our opinions. The results we got indicate that this was achieved and all our respondents have verified that the information collected during the interviews has been presented correctly. Thus we find the research process to be reliable. We have with all our means conducted the research with care and objectivity as well as acted in good faith. We have, as mentioned earlier, acquired the approval from our respondents that the information is presented correctly whereby we find it presenting a fair picture of the context. In conclusion, we find our thesis to be trustworthy as well as authentic.

2.6 Critique

Layder (1993) (as cited in Bryman & Bell, 2013) states that the distinction between quantitative and qualitative research no longer is applicable and actually false. Nevertheless, we have chosen to accept Bryman and Bell's distinctions between quantitative and qualitative research since we find this distinction more similar to our approach. According to Bryman & Bell, (2013) validity can to some extent be important when performing qualitative studies.

Other authors push for trustworthiness and authenticity as measures for the quality of the research. We have contemplated around this and accepted trustworthiness and authenticity as most suitable for our thesis.

The material of our study is secondary data why it is important to remember the limitations inherited to this kind of data. Initially, one does not have complete knowledge about the data and the structure of it. Further, this type of material can be complex but since we chose the top 100 grossing apps this complexity was reduced. Finally, it is not always possible to control the quality of the material and sometimes key-data is missing. Regarding the trust in our data material we believe that out source is trustworthy but we did have trouble finding all the data needed (Bryman & Bell, 2013).

As for the interviews there is always the possibility to affect the respondents. We were careful with showing reactions or expressing opinions or leading the questions during the interviews, though it is not possible to fully ensure the objectivity (Bryman & Bell, 2013).

3.0 Theory

3.1 Business Models

In the following sections, theory will be describing what a business model is and how it can be defined. Amit & Zott (2010) argues that, "A business model depicts the content, structure, and governance of transactions designed so as to create value through the exploitation of business opportunities", to highlight the drivers of value creation.

Magretta (2002) describes a business models as "stories that explain how enterprises work" and continues further with the notion that a business model should point out; "Who is the customer and what does the costumer value?" and "What is the underlying economic logic that explains how we can deliver value to customers at an appropriate cost?" (Magretta, 2002). When combining the knowledge of these two fundamentals in the business model an explanation of how to make money out of the business is created. Thus it should address how to at an appropriate cost, deliver value to customers and how to capture some of the value created in the process (Casadesus-Masanell & Ricart, 2010). This description considers the business model as groundwork for how to anticipate businesses behavior (Magretta, 2002).

Therefore, a sound business model is vital for any viable organization since it provides an explaining structure for how the different parts of the model interact. Magretta (2002) also claims that a business model is difficult to replicate, and by its nature will change the economics of an industry, which will in turn create strong competitive advantages.

3.1.1 Value Creation

According to Johanson et al. (2008), a business model consists of four fundamentals that, brought together, will create and deliver value to the customer. Firstly, a business model need a customer value proposition that is attractive and responds to or fills a need that customers have. Secondly, a business model needs a profit formula that acknowledges revenue model, cost structure, margin model and notion of resource velocity. Thirdly, an opinion about how, and which, key resources will bring value to the customers as well as how these resources interact, has to be established. Finally, the key processes have to be considered in the business model to establish how processes, norms, rules and metrics will add value to the customer value proposition.

According to Brandenburg and Stuarts (1996) definition of value creation, it can be divided into two categories; the value created by vertical chains of suppliers, firms and buyers, and the added value of a particular player in the vertical chain. In the vertical chain the creation of value will depend upon the characteristics of suppliers, firms and buyers, which are the three players that represent the value chain structure. The value created by these players is then determined by the two factors; willingness-to-pay and opportunity cost (Brandenburger & Stuart, 1996). These two can be explained and defined in many ways, Brandenburg and Stuart (1996) illustrates it by the formula, value created = willingness-to-pay – opportunity cost. Willingness-to-pay represents the spectrum of how much the buyer is willing to pay for acquiring a given amount of goods for a certain price. The opportunity cost represent how much value the buyer can consider to abstain when choosing one out of two alternatives.

On an organizational level of analysis Bowman and Ambrosini (2000) defines value creation as; use value and exchange value. First, perceived use value is described as how value is defined by customers. The customer, based on perceptions of the product or service, compare the value of the product to the usefulness. How much the customer are prepared to pay for the product or service are the total monetary value. Second, when the product is sold the exchange value can be established. It is the perceived value of use for the buyer and what the actual price paid to the producer were. Though, important to keep in mind is that the perception of value is subjective (Bowman & Ambrosini, 2000). Lepak et al (2007) enriches the definition, to achieve a multiple level of analysis, by adding the dimension; how the needs of a user in relation to how the users perceive the quality of a service or product (Lepak, et al., 2007). Bowman and Ambrosini (2000) argue that value is created by organizational members and the perceived power relationships between economic actors are determining the value capture. An important aspect is to know how the users judge the value of a product. This judgment is established by the development of expectations and how the utility they are going to get is judged. Purchasers review how the attributes of product will satisfy their needs. Since this is done before consumption of the product the evaluation is based on an insinuation between the offerings of the ranges of existing products. Customers aggregated perception of value is then based upon the beliefs of the goods, their needs, unique experiences, wants, wishes and expectations. This gives the customer a perception of the value exchange; what is given and what is received (Bowman & Ambrosini, 2000).

Due to the increasing share of active, informed and connected consumers as well as the conjunction of industries and technologies the competitive landscape is changing reshaping traditional way of competing. It is simple to create product variety today whereby it becomes inefficient to compete on these conditions. Instead the new approach of competing will be to co-create value with consumers and co-creations experiences have to be the focus of innovation. Opposite of the firm trying to please their customers, value co-creation is about uniting the company and the customer in the process of creating joint value. This allows for co-construction of the experience by the customer to suit a specific context. If applying value co-creation customer and company creates a common forum for joint problem definition and problem solving. This enables for an experience environment where the dialogue with the consumers creates the possibility to co-construct personalized experiences. The product may be the same for all customers initially though each customer has the mean to tweak their experiences while using it. Thus creating experience variety and the possibility to experience business in the eye of the consumers in real time. Further a continuous dialogue, co-construction of personalized experiences and establishment of innovating experience environments to generate co-creation experiences (Prahalad & Ramaswamy, 2004).

To be able to explain factors important for value creation when choosing business model, the following sections explain dimensions relevant for the applications industry.

3.1.1.1 Exposure to Advertisements

Mere exposure to banner ads is believed to enhance consumer preference for brands featured in banner ads. Perceptual priming (perceptual priming "perceiving and identifying an object or word is improved by experience with that object or word (Wiggs & Martin, 1998)) is indicated by research to increase the ease of processing primed ads and brands, this despite an exposure time less than 50 milliseconds. When the exposure duration lasts long enough to register at conscious levels the ease of processing the message of the ad is likely to increase, whereby it influences the consumer's evaluation of ads and brands. Even though exposure to the advertisement is short, it will enhance the association to what have been seen thus causing a positive impact on ad and brand evaluations among consumers. Messages or ads the customer find more relevant to them are more likely to be accepted than if not relevant (Wang, et al., 2013).

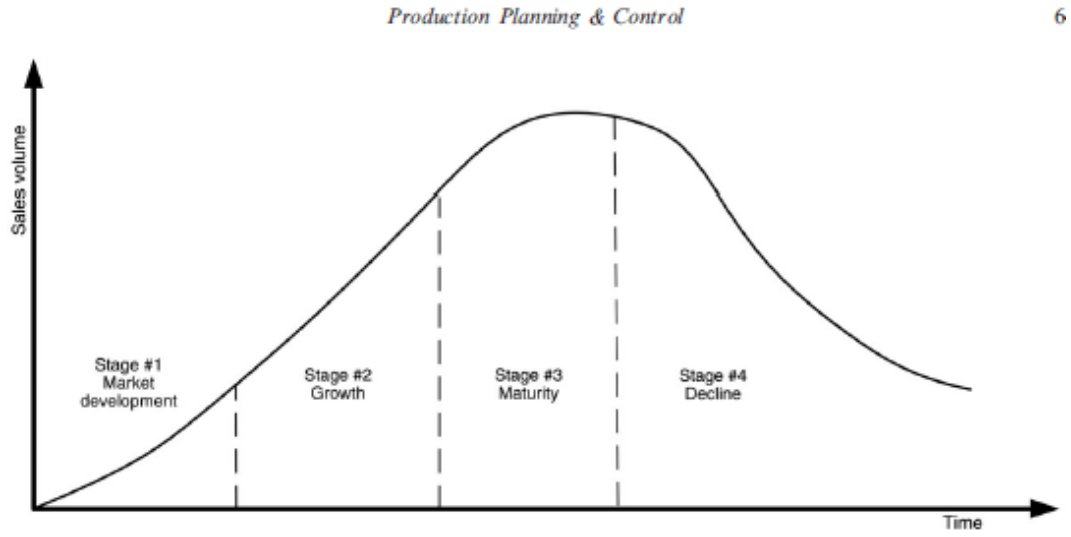
Mobile users have been seen to respond to advertising in general at a higher frequency after viewing mobile ads compared to non-mobile users. Further, it is six times more likely that a smartphone user have seen an in-app or web ad, than that of a feature phone user (Wang, et al., 2013).

3.1.1.2 Multi-Price Strategy

According to Mohammed (2005), pricing should be about value because value is in the eye of the beholder, not about cost which is the most common way of determining the price for a product or service. A multi-price strategy allows for profits to be captured from each customer's distinctive product valuation (Mohammed, 2005). Further, digital products have a unique characteristic in the ability to be sold again and again without diminishing its value. Moreover, "Versioning" is a strategy where multiple versions of the same product are created which allows businesses to target different customers in accordance with their individual willingness to pay. This strategy involves offering the original product and digitally switching features on and off at minimal cost (Grover & Ramanlal, 2000).

3.1.1.3 Product Life Cycle Theory

The product life cycle concept is a framework intended to adapt a products pricing and manufacturing strategies according to the relative success a product is experiencing in any given stage of its lifetime. It is also used to determine when a product has reached the end of its lifecycle after which manufacturing of the product should be discontinued. A products life-cycle goes through the following four stages, as depicted in the diagram below; market development, growth, maturity and decline (Cao & Folan, 2012).



Picture Source (Cao & Folan, 2012).

3.1.2 Value Capture

Value capture is a way of measuring how large part of the industry value a certain company is able to absorb. The ability to capture value is dependent on the attractiveness of the value proposition as well as the rivalry in the industry. If a company is fairly free from competition the value capture will naturally be higher but if competing with other players on the market, the value capture will decrease due to market frictions (Chatain & Zemsky, 2009).

In order to explain important factors for value capture when choosing business model, the following sections explain dimensions relevant for the applications industry.

3.1.2.1 Pricing

Economic theory describes utility maximization and decisions benefitting self-interests to be the behavior of customers. Customers that believe the price is fair are more likely to trial-buy a product and repeat the action of buying, than if they consider the price too high. Thereby the notion of a fair price will be consistent if the price covers the expenses of the received benefits. Customer value can also be defined as the difference between the consumer's willingness to pay and the actual price paid (Hinterhuber, 2003).

Pricing is a highly complex problem and to avoid pricing errors, relevant internal and external variables have to be included in the decision. To stay competitive on a dynamic market, continuous assessment of the pricing has to be conducted. Hinterhuber (2003) further states that assumptions of not being able to combine high prices and high market shares are incorrect. Indications in different industries have shown premium brands actually quite often are the market leader. Though the common belief is that small niche markets are most suitable for high pricing strategies there are occasions where, if the customer value is high and communicated well, it is possible to apply these strategies and achieve large markets shares and thus charge higher prices.

Hinterhuber (2003) argues for profitability being highly affected by price where just a small change in price has a great effect. To increase the price just slightly is the most effective factor to modify and exceeds all other changes in operational management. A well-known marketing advice on pricing advocates low prices when introducing a product in order to capture market share initially. The term ‘‘Penetration pricing,” is a pricing strategy to quickly establish a position on the market.

3.1.2.2 Monetization

Chandavarkar defines monetization as “the enlargement of the sphere of the monetary economy”. It can also be described as the extent of how much a purchaser has paid for the total value created by services and products, as well as to which rate money is used. Value is regarded monetized when constituting a medium of exchange or a unit of account. Thereby the term is a way of analyzing monetary structures, or more explicitly; the transformation from product or service into financial means. (Chandavarkar, 1977).

To incorporate the term monetization into a context close to the applications industry the following section describes more hands on definitions of monetization.

Ways of monetizing value can have different shapes depending on the revenue model used. Clemons (2009) describes pay per subscription one way of monetizing business. This revenue model offers content which is paid for on a monthly basis for access. This model is commonly applied by those selling content or information. Other monetizing activities can be direct purchases also referred to as micro-payments, where the service or goods are exchanged against money. Moreover, advertising is a technique for monetizing business, where content exposed are paid per view. Other way of monetizing online businesses are to sell experiences and participation in a virtual community, pay for usage. Others sell aggregated information about their users from the users online experiences. This data is usable for predicting customer behavior and preferences as well as when targeting specific customers, called pay for information. Moreover it is possible to monetize and sell content extracted from virtual communities, pay for acquisition (Clemons, 2009).

When using the “freemium” model to monetize digital content, different approaches is possible to use. A pay-wall can be applied where the services is available in different layers; free for basic access and then incremental charges are constituted where the customer pay for access to premium content. This can be applied by allowing in-app purchase or providing ad-supported content/software. Further, restraints can also be applied and then charge for providing a richer content such as having a free trial version with limited capability, time or features (Martin, 2012).

3.2 Disruptive Innovation

The astonishing development of the applications industry is certainly remarkable and a field of interest to look further into, in the quest to find the recipe for such success. A theory that can be helpful in determining the critical factors in the industry development is the theory of disruptive innovation. This theory provides a solid base for analyzing technology intensive innovations and how these innovations can reshape industry structures as well as changing competitive landscapes.

The phenomena of disruption have been ruling in industries characterized by technology for the past decades. The most common and distinct example is the computer industry where IBM lost significant power when missing the upcoming minicomputers (Bower & Christensen, 1995). Disruptive innovation is a new competitive paradigm and has been described to be "like missiles launched at your business" by Wessel and Christensen (2012). The core of disruptive innovation is that it replaces and makes earlier innovations just about obsolete. Disruption can roll out in different pace; it may be both fast and finalized right away, or in some cases, little by little to become just partly finished, regardless of whether the innovation is considered to be a process or only an occurrence. Other characteristics determining a disruptive innovation is if it stem from advantages in the business model or from technology which aims to target customer's up-stream in the value chain with higher demand (Wessel & Christensen, 2012).

3.3 Value Migration

The theory of value migration consists of several factors that are applicable in the applications industry whereby it is suitable to use for understanding changes in the industry structure and redistribution of profits. This section is moreover intended to shortly emphasize why value is important and how it affects strategy and competitiveness.

Value can be determined both by how customers perceives quality in relation to price, commonly known as customer value mapping. It can also be determined by the aggregated advantages and disadvantages the customer perceives by buying a certain product, known as the economic value model. The second model helps to determine tactic and strategic planning, as well as recognizing the differentiation value of a product, this in the notion of establishing competitiveness in pricing (Smith & Nagle, 2005).

Brandenburger & Stuart (1996) follows and build their definition upon Porter's (1980) definition of value, as something that appears along a vertical chain reaching from resource suppliers, through the firm to buyers of the products or services provided. Further, the three players are the ones creating value together and the definition of value determines how the value is distributed among value chain players (Brandenburger & Stuart, 1996).

The core of the value migration theory is to understand and evaluate the evolvement of the value chain (Christensen, et al., 2001). Christensen et al. (2001) states that value chains become predictable when the industry or products reach a stage of maturity and that the development follows two stages; the "tight fit" stage and the "going to pieces" stage. The first stage illustrates the situation where the product offered to the customer does not yet meet their needs and will undergo several changes in order to meet customers demand. During this stage the product undergoes major changes especially if being a technological device. The second stage is reached when the product offers more than what the average customer actually demands which then makes room for other companies to provide an offering to the less demanding customers and by doing this disrupt the value chain (Christensen, et al., 2001)

In order to compete with a product that possess more attributes than the average customer demands, other companies has to approach an underserved segment with customer demanding less (Christensen, et al., 2001). If collaborating with other companies to produce qualitative innovations cheaper and faster while simultaneously also finding new customer segments, new entrants have the possibility to compete with well-known established players (Slywotzky, et al., 2006). Furthermore, if serving a less demanding segment, products need to be more flexible and have a higher level of adaptability in order to serve the market faster and to provide the customers with features that are appealing (Christensen, et al., 2001). On the other hand there is a fine line for how much to customize. If customization is too high, the cost will be too high, and if the customization is too poor, the product will be unattractive (Slywotzky, et al., 2006). These conditions therefore force companies to adapt to a modular structure in order to create a more agile and faster value chain.

The computer industry has developed according to this model. The companies dominating the industry were deeply integrated throughout the whole value chain. When Dell started to produce and distribute personal computers with a modular value chain, the integrated structure of IBM became problematic and they subsequently struggled with their

competiveness. Modularity rather than any other factors has proven to be critical and Baldwin and Clark claim that the best way to handle changes like these is to employ a strategy based on modularity (Baldwin & Clark, 1997). Adopting a modular structure creates dynamic abilities and can therefore offer customers high flexibility and/or personalization. This shifts customer focus to value other capabilities instead of only the product performance which put the integrated players out of competition (Christensen, et al., 2001).

According to Slywotzky, business models that are outdated will not provide what customers are demanding, which enables for flows of value migration to new business models capable of providing the right offerings (Slywotzky, 1995). Moreover, Christensen, et al., (2001) explains that to be interdependent in a value chain and to control interdependent links is another factor that influences who captures the profits.

3.4 Business Ecosystems

In 1993, James F. Moore presented the theory of business ecosystems in Harvard Business Review. "To extend a systematic approach to strategy, I suggest that a company be viewed not as a member of a single industry but as part of a *business ecosystem* that crosses a variety of industries. In a business ecosystem, companies coevolve capabilities around a new innovation: they work cooperatively and competitively to support new products, satisfy customer needs, and eventually incorporate the next round of innovations." Further, he used Apple Computer to exemplify the characteristics of a business ecosystem. Apple's ecosystem extends into at least four industries: personal computers, consumer electronics, information and communication. Apple's ecosystem consisted of a web of suppliers including Motorola and Sony and a large number of customers in various segments. Moreover, Apple's leadership in that ecosystem was considered valuable by the rest of the community and enabled all ecosystem members to invest toward a shared future (Moore, 1993).

In 2004, Iansiti and Levien further developed the business ecosystem concept in "Ecosystems as ecology." The connection between biological ecosystems and business ecosystems is made stating that: "Like an individual species in a biological ecosystem, each member of a business ecosystem ultimately shares the fate of the network as a whole, regardless of that member's apparent strength. They further exemplify an ecosystem with the thousands of cooperating companies needed in order to create a successful software OS. Moreover, the ecosystem leadership is further developed by introducing the "keystone advantage" concept. Keystone

organizations' aim should be to improve the health of their ecosystems by providing structure and a set of common assets. Further, "keystones can increase ecosystem productivity by simplifying the complex task of connecting network participants to one another or by making the creation of new products by third parties more efficient (Iansiti & Leiven, 2004).

At this point we find it valuable to introduce business ecosystems in relation to software development in order to further aid the understanding of business ecosystems in the realm of the mobile applications industry.

"In its most fundamental sense, a software ecosystem (SECO) is a system within which the traditional walls between development entities have been broken down allowing collaboration and interoperability between parties. The pioneers of SECOs seem to agree that the essential elements of such SECOs are informal networks through which independent entities collaborate to produce software and services for a common market" (Cambell & Ahmed, 2011, p. 51). The authors further acknowledge customers opportunity to become developers themselves and make applications which can be used for personal use or commercial sale (Cambell & Ahmed, 2011).

3.5 Platforms

This is one of the major sections in our study since this structure is what the major players in the applications industry are competing with. We will present platform structures and factors important for achieving competitive aspect of the applications industry. .

The mobile applications industry consists of several different important and influential platforms which represents an important part of this thesis. Further, platform dynamics play an important part in understanding business ecosystem, two-sided markets and network effects.

According to Cusumano (2010) an industry platform has two essential characteristics; first, to provide a common base and core technology applicable on several different products, and secondly, complementary products or services play an important role and the platform would not be equally valuable without them. This is one description of the underlying structure. Nevertheless, there are other definitions which complement and broaden the concept of platforms. Becker et al (2012) supports the fact that the term platform can be defined in many

ways and means that the technological explanation of a platform can be defined as “a shared and stable set of hardware, software, and networking technologies on which users build and run computer applications” (Bresnahan, 1998).

The different definitions of platforms make the concept of platforms widely applicable to many industries and many contexts. It can be described as a structure where each and every platform has its own core business, either a product or a service (B. Cusumano, 2011). Or, as according to Becker et al (2012), a platforms objective is to unite two or several stakeholders in order to extract value from both sides, most often represented by a supply side and a demand side. Core products or services are based upon technology that is adequately free for other companies to apply for making complementary products or services. By having complements, provided by other businesses, encircling the core product, the value of being connected to that certain platform increases. A positive feedback loop is created by new platforms entrants who are commonly expressed in terms of network effects (B. Cusumano, 2011). Thus it is important to distinguish between the concept of platforms and network effects, since the network effects are a result of platform participants adding value by joining, and cannot be created without a node, the core business. Platform industries have two-sided markets since offering a place for stakeholders to unite and exchange products, services and payment means (A. Cusumano, 2010).

Platforms are often run by one company providing the core product or service. That company can apply different strategies to attract and retain users and developers. The platform owner can, by creating switching costs and offer bundling services, make a change of platform both costly and less convenient for both users and developers (A. Cusumano, 2010). Retaining and attracting new users are important for platforms since the size of the platforms installed base of users increases the attractiveness of the platform. Cusumano points out however; that running a platform is not what is important, being recognized as the industry standard is. The stride to become number one and achieve standard status has historically been common in technological industries and is a preferable stage of businesses due to the obvious advantages of market domination (A. Cusumano, 2010).

When defining platforms, a distinction can be made between the systems the platforms are employing; it can either be a closed system or an open system. If the system is closed the platform leader is the one dictating the available content for platform participants. If an open

system is employed, the platform leader provides a meeting point, the platform, but independent third parties with a high degree of freedom are developing the content for participants (Becker, et al., 2012).

3.6 Network Effects

The concept of network effects has been used earlier when explaining both business ecosystems as well as platforms. This section will shed further light on the concept of network effects in order to fully understand its role and importance.

The theory of network effects was first developed by Katz and Shapiro in 1985. Katz and Shapiro characterize network products as "...products for which the utility that a user derives from consumption of the good increases with the number of other agents consuming the good". That is, when the value of a product or service is dependent on the number of others using it, network effects are present (Shapiro & Varian, 1999).

A relationship between network effects and supply-side economics has been noted by many economists and network effects are therefore sometimes referred to as demand-side economics. Today however, network effects is the most commonly used term since the term recognizes that network effects are usually not limited to one firm but rather includes a whole compatible network of technology (Birke, 2009).

Further, network products are durable products, i.e. products used over a considerable period of time. The consumer purchasing the product is therefore not only interested in the current installed base of users but is also interested in the number of users in the products network over the products life cycle. Köster (1999) as cited in (Birke, 2009) considered this and proposed the following definition of network effects:

Network products are goods or services for which demand considerably depends on historical sales (installed base) and expected sales (expectation basis) from other complementary durable goods.

3.7 Two-Sided Networks

In order to understand how network effects can be harnessed, this chapter presents two-sided networks. Two-sided networks are economic platforms that have two distinct user groups that

provide each other with network benefits. Newspapers, for instance, join subscribers and advertisers. Products and services that bring together groups of users in two-sided networks are platforms (Eisenmann, et al., 2006). Any organization that creates value primarily by enabling direct interactions between two (or more) distinct types of affiliated customers has created a multi-sided platform (Hagiu & Wright, 2011). The platforms provide the two sides with infrastructure and rules which facilitates transactions. The infrastructure and rules can take many forms. For example, some rely on a physical product such as the consumer's credit cards and merchant's authentication terminals. In other cases, it can be places providing services, like shopping malls or Web sites such as eBay (Eisenmann, et al., 2006).

Two-sided networks differ from traditional value chains in one fundamental way. In traditional value chains, value moves from left to right, where costs are to the left of the company and revenues are to the right. In two-sided networks however, costs and revenues are both to the left and to the right, because the platform has a distinct group of users on each side. The platform incurs costs in serving both groups and can collect revenues from each, even though one side is often subsidized. The two groups attract each other, a phenomenon economists call network effects. With two sided network effects, the platform's value to any given user largely depends on the number of users on the networks other side. Value grows as the platform matches demand from both sides. For example, video game developers will create games only for platforms that have a critical mass of players, because developers need a large enough customer base to recover their upfront programming costs. In turn, players favor platforms with a greater variety of games (Eisenmann, et al., 2006).

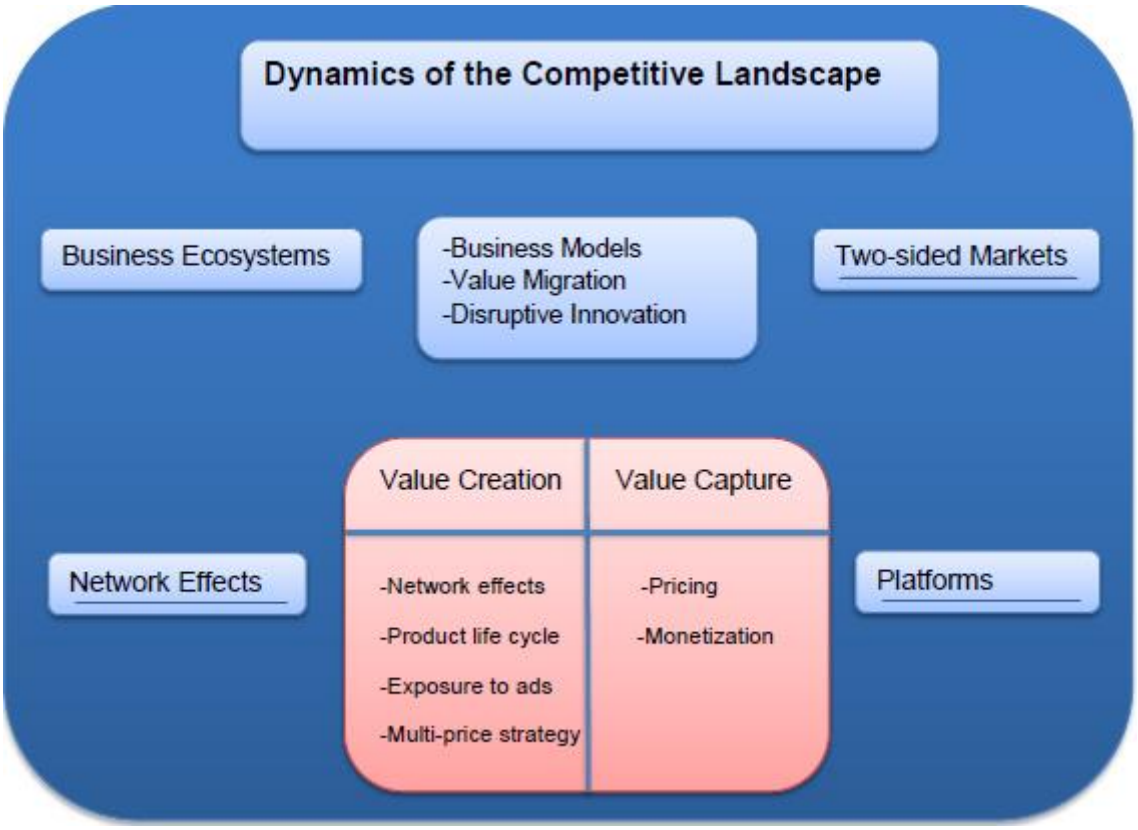
Because of network effects, successful platforms enjoy increasing returns to scale. Users will pay more for access to a bigger network, in that way margins improve as user bases grow. The promise of increasing returns can create fierce competition in two-sided network industries. Platform leaders can leverage their higher margins to invest more in R&D or lower their prices, outcompeting weaker rivals. As a result, two-sided network industries are usually dominated by a handful of large platforms, as is the case in the credit card industry (Eisenmann, et al., 2006).

3.8 Theoretical Framework

Due to the two-folded purpose of this thesis, the theoretical framework we have created is rather complex. The competitive landscape in which the application developers operate is

visualized as surrounding the theories closest related to application development, value creation and value capture. We have done so because value creation and value capture is essential theories in explaining the business models in our case study. The dynamics of the competitive landscape is present to understand and explain how the application industry came into existence and under which conditions application developers now compete. The business model theory, as described by Amitt and Zott (2010), will be the most pervasive theory in this thesis. Business model theory renders a holistic approach to how organizations create value and capture value, independent of how that is done in every specific case. In relation to business model theory and the telecom industry, the following theories are important to include in the study; business ecosystems, platform theory, network effects and two-sided markets. These concepts are all very much prevalent in the telecom industry today, however used in different ways in order to support differing business models. What they have in common though, are the contributions to disruptive innovations in the telecom industry. The disruptive innovations in the telecom industry have opened up for a discussion concerning value migration in the value chain, as well as creation of new value. Further, value creation and value capture has been awarded certain theories intended to serve as explaining variables in relation to application business models. Subsequently, when business model theory takes a holistic approach, it is foremost intended to explain the business model dynamics in the disruption of the telecom industry.

These theories all interact and are highly interdependent. Hence, a theoretical framework explaining what brings about what change, individually and in which order, is hard to determine. Therefore, our proposal of a theoretical framework should be considered only as one possible point of view. This framework will help us analyze the relationship between theory and the empirical material and data.


Dynamics of the Competitive Landscape
Business Ecosystems
-Business Models
-Value Migration
-Disruptive Innovation
Two-sided Markets
Value Creation
Value Capture
Network Effects
-Network effects
-Product life cycle
-Exposure to ads
-Multi-price strategy
-Pricing
-Monetization
Platforms

4.0 Empirics

4.1 Introduction Applications Industry

The smartphone market today are a duopoly market dominated by the two giant Oss , iOS and Android, and these two OSs are run on almost nine out of ten smartphones globally where Android has two thirds of the whole smartphone market (Shaughnessy, 2013). Given the domination of these two platforms they also have most applications available in their app stores. Below we have extracted some numbers from Apple and Android which indicates the width of this industry.

The 16th of May 2013 Apple's app store reached an incredible rate of 50 billion downloaded apps. On Apple's website one can see what 50 billion can do in different contexts. For instance; 50 billion bricks would be enough to build the Chinese twelve times over again, that it takes 1 600 years to count to 50 billion and 50 billion steps takes you around the world over 800 times (C. Apple, 2013). This astonishing development has characterized the telecom industry during the past five years and it has gone through many dramatic changes during this time as well. Before the introduction of the iPhone in 2007, the industry, mainly though network operators, provided for basic voice, text messaging and VASs (value added services). The number of available apps in Androids Google Play app store is now more than 800.000 (RssPhone.com, 2013). While surpassing Apple in number of available apps, Android does not count for as many downloads and have recently passed 13 billion downloaded apps on Android Market (AndroLib, 2013).

According to Flurry Analytics (Appendix) the average smartphone user spends 158 minutes a day using applications. It is most common to spend time using gaming apps which count for 32% followed by Facebook on 18% and browsing the web with 12%. To use applications has become incorporated in people's everyday life and as mentioned above the average user spend more than 2, 5 hours a day using applications.

4.2 Smart Devices

In the introduction to this thesis we made the point that the choices that consumers and businesses make, drives and is driven by, the technological progress of both applications and devices. This relationship has created a market for what is most commonly referred to as smart devices. A smart device is one that can offer the following two main opportunities;

mobility and connectivity. As of now, smartphones and tablets are the devices mainly referred to as smart devices.

"Each of these devices is primarily used for data applications and different individuals choose different sets of screen sizes in order to fit their unique needs. These kinds of developments are creating exciting new opportunities that will continue to drive the smart connected devices market forward in a positive way" Bob O´Donnell, 2013 (A. Lomas, 2013).

More than 1.2 billion smart devices were shipped in 2012 alone. Statistics show that more than twice as many mobile devices are sold as compared to PCs (Appendix 7). As the number of smart devices increase, and as their design is further adapted to users need for mobility, opportunities for growth of the mobile applications industry obviously accrue. In this chapter we will summarize the main differences and similarities between these devices as well as their current and expected future global market penetration.

4.2.1 Smartphone Penetration

Leading information technology research and advisory company Gartner Inc, defines a smartphone in the following way; "A **smartphone** is a mobile communications device that uses an identifiable open OS. An open OS is supported by third-party applications written by a notable developer community. Third-party applications can be installed and removed, and they can be created for the device's OS and application programming interfaces (APIs). Alternatively, developers must be able to access APIs through a discrete layer such as Java. The OS must support a multitasking environment and user interface that can handle multiple applications simultaneously. For example, it can display e-mail while playing music" (A. Gartner, u.d.). Further, it is estimated that in Q3 2012, 1.038 billion smartphones were in use worldwide (MobiThinking, 2013). That constitutes a global market smartphone penetration of approximately 29 % (GSMA, 2012). Further, forecasts suggest that sales of smartphones will continue to increase with an expected shipment of 1 billion smartphones in 2014 alone and reach 1.5 billion by 2017 (IDC, 2013)

4.2.2 Tablet Penetration

"A 'media tablet' is a device based on a touchscreen display, typically multi touch, that facilitates content entry via an on-screen keyboard. The device has a screen with a diagonal dimension that is a minimum of five inches. Media tablets feature connectivity via Wi-Fi or via 3G/4G cellular networks. Tablets typically offer day-long battery life, and lengthy standby

times with instant-on access from a suspended state" (B. Gartner, u.d.). The tablet penetration rate for the top 19 advanced markets was in 2012 at 4.7 %, expected to rise with 177 % to 13 % by 2015 (Barnard, 2013).The introduction of the tablet computer does have significant impact on the sales of traditional PCs. According to the Computer Industry Almanac Inc., 20,9 % of PCs sold in 2012 were tablets and that number is expected to rise to 35.9 % in 2015 (New Media Trend Watch, 2012). The sales of tablets are expected to exceed sales of PCs by 2015 (Appendix 5). Further, 1 in 3 minutes spent online is now spent on devices beyond the PC (ComScore, 2013). Moreover, tablet and smartphone users rather use applications than web browser to access online media (Kondolojy, 2012).

4.2.3 PCs

As portable and desktop computers are considered smart devices (Wauters, 2013) even though they do not contribute to the development of mobile applications, we find it important to point out the current changes in consumer preferences concerning these different devices because those numbers can be telling for the future development of mobile applications. If devices that most commonly run mobile applications are on the rise, whilst devices that generally meet other needs are on decline, the future of mobile applications would hence be bright. Statistics does show a heavy increase in shipments of smartphones and tablets, while desktop and portable computers shows significant decline (Appendix 1).

Moreover, statistics from IDC for Q1 2013 shows the steepest decline in PC sales in a single quarter ever recorded. Global shipments during Q1 2013 totaled 76.3 million units, a 13.9 % decline compared to the year before. The decline was double compared to the expected decline of 7.7% (McGlaun, 2013). For illustration see Appendix 1.

4.2.4 Future Application Sphere

The potential growth and reach of mobile applications into yet unknown territory is hard to predict. The Internet of Things (IoT) though, is a future vision of an endlessly connected world, where for example, the office plant tells your smartphone when it needs water and the smartphone will find the watering pot for you through an RFID chip in the pot (The Internet of Things, u.d.).As of now though, the commonly used devices for mobile applications are those presented previously in this chapter. However, mobile applications are diverging into a few new arenas already. **Smart Tvs** for example, has web-based features that enable applications, unlimited streaming and syncing over multiple devices. These Tvs has been

around for a while now and will probably be present in most living rooms in a few years (Kovach, 2010).

Mobile applications in **vehicles** are another area that is emerging. Ford and GM have released software development kits (SDKs) and application programming interfaces (APIs), open for developers to use and create innovative applications (Lardinois, 2013). **Mobile health** is also already here to some extent (Empson, 2012). Both healthcare providers and consumers are adopting the smartphone applications for healthcare, and the market is expected to reach 26 billion USD by 2017. In the US, 3 million free and 300.000 paid mobile health applications have already been downloaded from Apple's app store alone (Jahns, 2013).

4.3 Business Models

4.3.1 Platform Owners and Their Business Models

Mobile applications are commonly developed to be run on a specific OS and the OS is the central hub of any platform. The platforms are in turn central to any one participating, creating an ecosystem of compliments and contributors. The company supplying the OS is generally considered the platform owner since being the player who sets the rules, policies and opportunities for participation. There are a number of different OSs and platforms available for anyone to contribute to. However, platform economics often create a market of very few dominant players, as is the case in the telecom industry today (A. Vision Mobile, 2011). Apple, Google and to a lesser extend Blackberry and Windows, now attract most mindshare to their ecosystems, as seen in Appendix 12 (G. Vision Mobile, 2012). However, Amazon and Facebook are now considered valid competitors (C. Vision Mobile, 2012).

The principles for participation for third parties are generally the same for these platforms, varying slightly in cost of participation and attractiveness of installed user base (G. Vision Mobile, 2012). The major differences between these platforms though are the owner's business models. Apple e.g., is using their ecosystem to drive sales of their hardware, the iPhones and the iPads (C. Vision Mobile, 2012).

Due to the development of the smartphone, the importance of being connected to more than a mobile network has increased. The development of the applications industry has been created through the introduction of platforms, where hardware and software combined within an ecosystem delivers value to the customer.

4.3.2 The Origin of Platform Business Models in Telecom

The origin of today's platforms in telecommunication stem from Apple's disruption in 2007-2008. In 2007, Apple introduced the iPhone which was a total reinvention of previously available smartphones. The launch of Apple's app store in 2008 made the disruption complete. The iPhone disrupted the wireless carrier's way of controlling their own programs and added an intelligent OS and applications to the smartphone market (Bajarin, 2013). This was however not the first time Apple disrupted an industry. Lesson had been learnt from when they disrupted the music industry back in the early 2000's. Apple introduced the iPod in combination with iTunes which represented a classic case of network effects. iTunes revolutionized the way music was made available to people and the iPod was the only device back then which was connected to iTunes, the largest online music store in the world (Malshe, 2013). iPods surpassed MP3s in delivering digital music to the great masses (Bajarin, 2013). The disruption of the telecom industry with the iPhone and the Apple app store was hence heavily inspired by the previous disruption of the music industry (Bajarin, 2013).

The value chain of the telecommunications industry was previously modular; the first part of the value chain was commodity and differentiation hardware suppliers, OS providers and application suppliers which provided handset makers with products. The handset makers partnered up with operators to deliver a product ready to use. Apple however, employed an integrated value chain and made everything in-house and could use the operator's network services to run their products. They added the dimensions; innovative and appealing design with integrated easy to use software in one product (Murillo, et al., 2008). By controlling their own OS and incorporating apps, Apple created a disruptive product (Bajarin, 2013). Further all the features such as calendar, iTunes and pictures in combination with the OS also made the switching cost for the user higher. Additionally, the popularity of the iPhone made it possible for Apple to charge an operator to be the exclusive network provider for iPhone (Murillo, et al., 2008).

Apple

Apple has one of the most successful platforms and their app store contains most applications offering about 800 000 applications and has cumulative downloads of 50 billion (C. Apple, 2013). The OS is iOS which is developed and distributed by Apple. This system was released in 2007 and is only available for those who purchase Apple hardware, and license agreements prevent installation of the software on other devices. The core of Apple's business model is

their premium hardware, iPhone, iPad, iPod and Mac, where approximately 80% of their revenues stem from (C. Vision Mobile, 2012). Complements of the hardware are applications, telecom services, content and accessories. Notable is that the app store is run just a little over break-even and is thereby not a reliable profit source. Despite this it is very important for their ecosystem since it drives the core business, the hardware. Without the benefits of the ecosystem and the availability of the complementing applications, the benefit of choosing Apple's platform decreases. The premium product experience increases the number of iOS followers thus resulting in higher earnings (B. Vision Mobile, 2011). The app store is therefore categorized as loss leader strategy created to increase and attract users and developers to the platform. The key goals of Apple's business model are to increase volume and cross-sales of their devices and to protect the high margin on their products.

Reasons for why Apple is a step ahead of the competition might be because the company is; vertically integrated, have very brand loyal customers as well as the fact that they are controlling their commerce and distribution. The weakness of Apple, according to Chetan Sharma Consulting (2012), is the existing pressure on operator margins.

Apple has employed a mixed approach in designing access to their app store by offering significant access to their underlying platform though APIs whilst still retain control of their products. Nonetheless, according to Campbell & Ahmed (2011), Apple is still being criticized for having their OS closed on their devices despite their release of 1500 new APIs when launching the iOS 4.0 OS. Apple has created different categories of developers; Individual, Company, Enterprise, University and Developer. The distinction between Company and Enterprise is that a company is defined to develop applications for general sale whilst Enterprise is regarded to develop applications for internal organizational use. The requirements for Individual- and Company classes of developers are the same both in terms of cost to join and the share of sales revenue. The categories; University and Developer, are limited in terms of testing and support and do only offer access to the APIs for iPhone, iPod and iPad. These categories cannot market their applications through the app store but the registration is instead free of charge in relation to the commercial ones that spans from $99 to $299 a year (Cambell & Ahmed, 2011).

Google

Google has created the Android OS which is the OS with the most users. Their core business is online advertising which is supported by their key goals; to ensure that Google services are unrestricted for mobile access and to prevent other platforms to gain control over smartphone screens. Their strategy is to push for commoditization of mobile devices and support handset manufactures using their OS software for their devices. This way they use handset manufacturers as the distribution channel for Android and thereby extend their network (D. Vision Mobile, 2012). Moreover Google possess strengths such as broad adoption and support, an open developer platform as well as an ambitious organization (Chetan Sharma Consulting, 2012).

95% of Google's profits are generated by online advertising (C. Vision Mobile, 2012). Google aims to use their large market share to attract new developers to their ecosystem and expand into new screens for higher exposure (B. Vision Mobile, 2011). Since Google's source of revenue is online advertising, Google thrives when the number of consumers viewing the advertisements increase. Google is therefore actively working to flatten the space between consumer eyeballs and Google's ad inventory (C. Vision Mobile, 2012). Further, Google offers complementary products like Gmail, Gmaps and Google Voice to make the platform even more appealing (B. Vision Mobile, 2011). When Google expand their inventory for users, Google has increased the possibility to mine large shares of information about their users and can better micro-target their customers (C. Vision Mobile, 2012). Therefore, contrary to Apple, Google is generous with offering different device manufacturers to use their OS and thereby push for commoditization of devices. Since the platform has such an extensive network, it attracts both users who want to have access to the large amount of services and still be able to choose between different handset manufacturers. Developers are attracted by the possibilities to develop applications according to certain conditions and offer them to a large base of different customers (D. Vision Mobile, 2012). Factors that appear to be a weakness for Google are the fragmentation, low developer revenues and the lack of clear device strategy (Chetan Sharma Consulting, 2012).

Google makes no distinction between individual developers and commercial entities. A single off payment of $25 and an agreement to their market terms and conditions is what is required in order to register as a developer for Google. Developers are then provided with SDK tools and access to APIs. A release of an application can be distributed via the Android Market, directly through websites or alternatively via third parties. The only testing of the application

before launch is done by the developer; Google does not enforce any testing but will examine complaints or applications of a nature that may be offensive. Developers can chose to make their applications either free or paid when uploaded and if the applications is paid the revenue is divided 70/30 between the developer and Google, otherwise there are no charges (Cambell & Ahmed, 2011).

Microsoft

Microsoft has created their OS Windows Phone to support the core business of software licensing. However, they did not launch their OS till late 2010 which rendered a competitive disadvantage in relation to already existing OSs (Hollister, 2010). Their key goal is to prevent users from leaving their platform in favor of the ecosystems of Apple and Google by protecting their legacy cash-generating business of software licensing. When the popularity of clouded services increases, the traditional Microsoft business of licenses is threatened. As a move to increase competition and engage in the race to conquer market shares among smartphones they have now partnered up with Nokia to jump-start the ecosystem. Further, Microsoft pushes for a mobile business model more alike the business models for PC's to be able to supply services, apps and content from their platform. A split with the network operators of the revenues from the Windows Phone Market is also used as an incentive to increase sales of Windows Phones (D. Vision Mobile, 2012). Microsoft's bank balance and the fact that operators want a 3rd ecosystem are their strengths. On the other hand, the late start in the mobile market and the absence of mobile execution are their weaknesses (Chetan Sharma Consulting, 2012).

Blackberry

The core business of Blackberry is sales of devices. Their complementary services are focused on mobile messaging services and personal information management (A. Vision Mobile, 2011). The business model design is similar to Apple but with a larger focus on business clients. Therefore the key goals of their strategy are to defend market position in relation to other OEMs. Blackberry's intention to reach competitiveness is to modernize their software platform by acquisitions and expand into the tablet market segment. This strategy would avert the Apple iPad penetration into enterprise which has been Blackberry's main segment. Though efforts to reinforce their business and revive the platform, the outlook is not very promising due to wrong technology, misguided developer strategy and inability to focus

on consumer market. iOS and Android have created strong network effects and it might be too late for blackberry to break their user and developer lock in (A. Vision Mobile, 2011).

To become an application developer for Blackberry's Developer Zone and produce applications for their app store, App World, developers have to pay a registration charge of $200. BlackBerry is very selective when accepting new developers and to become an accepted developer at Blackberry, the quality of the applications is controlled. Further, applications offered in the App World tend to be more expensive when compared to other app stores, with applications ranging in price from $2.99 to $999.99 (Cambell & Ahmed, 2011).

Facebook

Facebook is different from the other platforms since it does not offer any hardware but still has a huge and very influential platform. The core business is online advertising and they derive most revenues, 82%, from displaying ads on its website. The complements to the online advertising are applications, telecom services, platforms and browsers. Being the number one social network across most of the world as of March 2013, the platform has 1.11 billion active users per month and is the all-time most popular app on all smartphone platforms (Facebook, 2013). Facebook's business model contains of two platforms in one; a communicating platform which is connecting users and an applications platform which is connecting users and developers. In 2012, the application platform had 2.5 million developers and 20 million apps were installed per day in the platform. The single purpose of both platforms is to drive user engagement which is monetized by ads and virtual goods (C. Vision Mobile, 2012).

The most prominent strengths of Facebook are their user base of about 1 billion users (Chetan Sharma Consulting, 2012). Further the platform has 751 million mobile users (Facebook, 2013) and according to Techcrunch (2013) the top 100 most grossing applications, 81 percent of the iOS applications and 70 percent of the Android applications, are integrated with Facebook. Due to a significant increase of mobile applications users Facebook has now, in order to match this development, released new mobile developer tools. This improvement is part the strategy of making it easier for developers to create more apps connected to Facebook. The value of this is when more apps are using their new features it allows Facebook to involve more content into the news feed which then shows ads and creates monetizing opportunities. Furthermore, extra structured data about user activities will be

available resulting in more targeted ads (Crook, 2013). Chetan Sharma Consulting (2012) has detected and describes Facebook's weaknesses to be the lack of coherent strategy and also the fact that there is no existence of an OS.

Amazon & Kindle Fire

Amazon is, like Apple, a device to cloud provider due to the same composition of their offering. The content, technology, device and retailing are their value proposition thus the core business lies within retail, e-commerce and the distribution channel. The Kindle Fire device is a low price product and is a complement leading the users onto their online stores. The business model is not competing with Apple since Amazon's core business is the correlative complement for Apple. Kindle is driving the content sales and uses the device as a complement. Amazon is experts in converting user engagement into sales and all complementary services are leading the customer onto their site for online shopping (C. Vision Mobile, 2012). Chetan Sharma Consulting describes Amazons strengths to be their knowledge about the user, and how to design the offered content, the commerce and distribution. Their weaknesses is explained to be the lack of an own OS and Amazon being novice to devices (Chetan Sharma Consulting, 2012).

4.3.3 Application Developers

Developers are claimed to be the engine of innovation in the new app economy (A. Vision Mobile, 2012). The range of different application developers is as wide as the variety of available applications (A. Vision Mobile, 2013). Vision Mobile has identified eight different types of developers; The Hobbyist, the Explorers, the Hunters, the Guns for Hire, the Product Extenders, the digital Media Publishers, the Gold Seekers and the Corporate IT developers (A. Vision Mobile, 2012) This shows that it spans from hobbyists to professional developers to companies making a living of app development. Developers have gone from experimenting and developing for fun at home to convert it into a profession (A. Vision Mobile, 2013).

Today there are over 500 000 app-developers active and according to the American research-centric investment bank Rutberg & Co, 15% of total venture capital investments in 2012 where made within mobile (as cited in (A. Vision Mobile, 2013). This stream of investments boosts and further motivates expansion of the application industry. The increase of application developers has led to the creation of a new line of careers within applications; there are not just developers anymore but also entrepreneurs, designers and makers. Supporting businesses

has grown to support the emerging force of application developers, as of today there are about 500 companies in the industry providing developer tools. According to Vision Mobile (2013) there is one developer tools start-up company for every 1000 app start-ups (A. Vision Mobile, 2013).

Even though the industry has attracted venture capital and experienced an explosive growth, the conditions for the developers to make a living out of application development are hard. Vision Mobile (2013) declare in their report Developer Tools: The Foundations of App Economy, that for those developers interested in making money, 67% lives bellow the app poverty line, meaning that they cannot make a living out of developing applications as they had wished for (A. Vision Mobile, 2013).

The market for App developers has widened due to the launch of tablets and a large share of the developers is now targeting the tablets market (A. Vision Mobile, 2012). According to Doug Drinkwater on TabTimes the market intelligence firm Evans Data present numbers showing that two out of three mobile developers are now planning to develop tablet apps within the next six months and Google's Android are said to be the preferred OS. The survey, Mobile Development, further shows that 73% of mobile developers are either currently writing apps for tablets (34.7%) or plan to do so by April 2013 (38.7%). In a sixth month period 19% of the 4,000 surveyed developers express intentions to begin their tablet planning (Drinkwater, 2012). Vision Mobiles Developer Economics survey in 2012 showed that developers targeting tablets has increased in a year from 34,5% to 50% (A. Vision Mobile, 2012).

4.3.4 Application Development Business Models

The applications industry is a huge business today and together all application platforms reaches revenue of 25 billion USD (Lessin & Ante, 2013). Despite this, it is hard to make money out of applications. According to Constantinou, CEO of the mobile analytics company Vision Mobile, 80% of the revenues in the applications industry is extracted by only 4% of the applications developers and two out of three apps is actually never downloaded. Rosengren, CEO at the application development company Netville, says “It is not profitable to develop your own applications and try to sell them in app stores. Some are lucky and some are not. Which is why we do not do it, we want full compensation for our work”. The difficulty of making money in app stores is, according to Amilon, CEO at the application

development company Vitamin, the “noise” in the app stores. “Noise” refers to the hardship of application discovery within app stores. The sheer number of applications interferes with the ability to reach visibility with your application.

The applications industry has a wide range of developers, and applications are developed for several purposes. Some applications are developed for app stores thus end-consumers, while some are applications developed for businesses. To explore this more closely we have chosen to divide application development into two categories due to their targeting. The first category is those developing applications for a platform which will be distributed by an app store. The second category is business applications which are ordered by a company for either internal or external use.

Another important aspect of the applications industry is the over-the-top services (OTT). An OTT service is defined as; content or service delivered over networks not owned by content/services companies themselves (Lunden, 2011). Connectivity may be as important to their business models as gas is to a car; nevertheless, it is the network operators who supply it, not the OTTs themselves. Because connectivity costs are paid by the user, OTT players have great flexibility in their business models. OTT players would like to drive commoditization of the network operator’s connectivity business. Affordable mobile broadband generates increased sales of smartphones, more ads are viewed, more software is sold and more e-commerce sites are visited. There are therefore a symbiotic relationship between OTTs and network operators at the connectivity layer. However, at the service layer, the nature of the relationship is asymmetric. Because connectivity costs are paid by the user, OTTs have the ability to price their services either free (e.g., Viber), close to free (e.g., Whatsapp), or even less-than-free (in the case of Google sharing app revenues with operators). Network operators cannot compete with less-than-free (F. Vision Mobile, 2012).

4.3.5 B2C

The business to customer section will present material covering developers targeting end-consumers in app stores. Vision Mobile (2012) describes different revenue models practiced in the applications industry and divides them by revenue source and revenue model. Business models used to extract value from customers are “pay per download”, “in-app purchase”, “subscription” and “freemium” (A. Vision Mobile, 2012). The app analyst firm AppAnnie

however, categorizes the business models into the following four categories; free, free with in-app purchase, paid and paid with in-app purchase (AppAnnie.com, 2013).

4.3.6 Mobile Application Business Models

The difficulty of generating revenues from applications has been clarified by many, developers as well as analysts. It is not just a simple way of making quick and easy money. Developers have to understand that even though the technological solution is outstanding, it is not enough. It has to be supported by a well thought through business model to generate revenues (Lavine, 2013). What follows is an explanation of common business models for mobile applications, as previously presented above.

Free (Ad-Supported)

The "free" app business model generates revenues by using a pay-per-click advertising model. This model makes the application totally free for the user but contain ads (Laurs, 2011). An advertising company places code in the application during the development process and as soon as the application is downloaded and launched by the user, the application requests to show the advertisement and then places it on the screen. The applications publisher usually gets between 60-70 % of the money collected from advertisers (Flynn, 2010). The advertising model is intended to work best for applications that are essential for users to open every day. It is as well preferred for applications where the user is using the application for long sessions at a time (Maltz, 2013).

Free + In-App Purchase (Freemium)

The freemium business model has no upfront download cost but comes with various optional in-app purchase options (Holmes, 2013). First, the user gets the free "basic" version of the application. Later, while running the application, the user is offered to purchase "premium" services (Laurs, 2011). The freemium model enables companies to extract revenues from customers in an almost perfect price-discriminating way. Customer segments are differing in willingness to pay for any certain product. Some customers are very pleased with the money spent on the product they have purchased while some feel they paid too much. Another segment of customers are those that would be willing to pay something for the product but not the full price. This segment would hence not engage with the product at all. However, the freemium model makes it possible for customers to try out the product and then decide

exactly how much they are willing to pay, and application developers are thereby able to exploit the total demand for their product (Holmes, 2013).

Paid

The "paid" business model simply charges the customer a one-time fee. After the purchase, the customer has all the features the application offers. Most app stores charge developers approximately 30 % (Laurs, 2011). This model has generally been recommended for applications with differentiated content where the user sessions are short, making it hard to catch advertising revenues (Maltz, 2013). However, paid applications are the only applications the app stores make any money off (they do not receive any revenues from free applications). Therefore, app stores are more willing to promote a paid application than a free application. This can be very valuable considering the hardship of getting attention in the noisy app stores (Flynn, 2010).

Paid +in-app purchase (Premium)

This business model has an initial one-time fee as well as in-app purchase options. This business model is a combination of the freemium and paid business models (Jones, 2013).

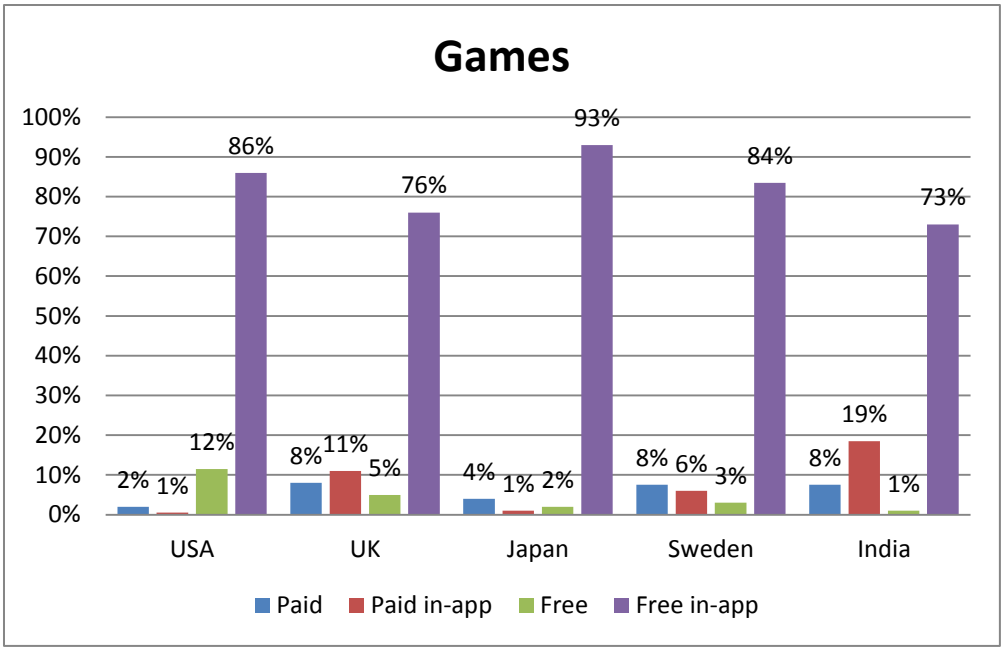
4.3.7 Sector Affiliation and Geographical Market

All figures presented below are based on the top 100 most grossing applications in the Apple app store and Androids Google Play store on April 4, 2013. The sectors chosen cover 76 % of users' time spent with mobile applications. The countries covered are the US, UK, Japan, Sweden and India.

The diagrams in appendices one through seven display the presence of specific business models in the top 100 most grossing applications for each sector. The y-axis represents the total number of applications and the x-axis represents the different business models.

Gaming

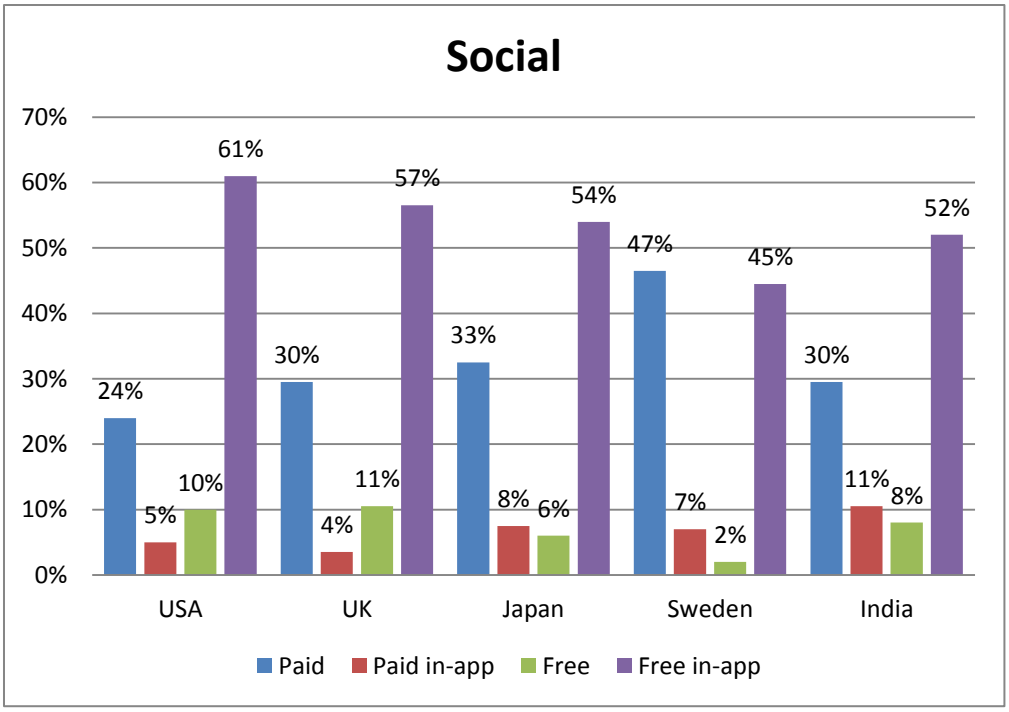
Users of iOS and Android spend 32 % of their time in applications within the gaming sector (Appendix 6). The most common business model for gaming applications is "Free In-app purchase". The presence of this business model in the sector ranges between 73-93 %. India has the lowest presence of "free in-app," however, the "Paid in-app" model is more common reaching 19 % (Appendix 6).



Picture source: own illustration, data extracted from AppAnnie (AppAnnie.com, 2013).

Social Networking

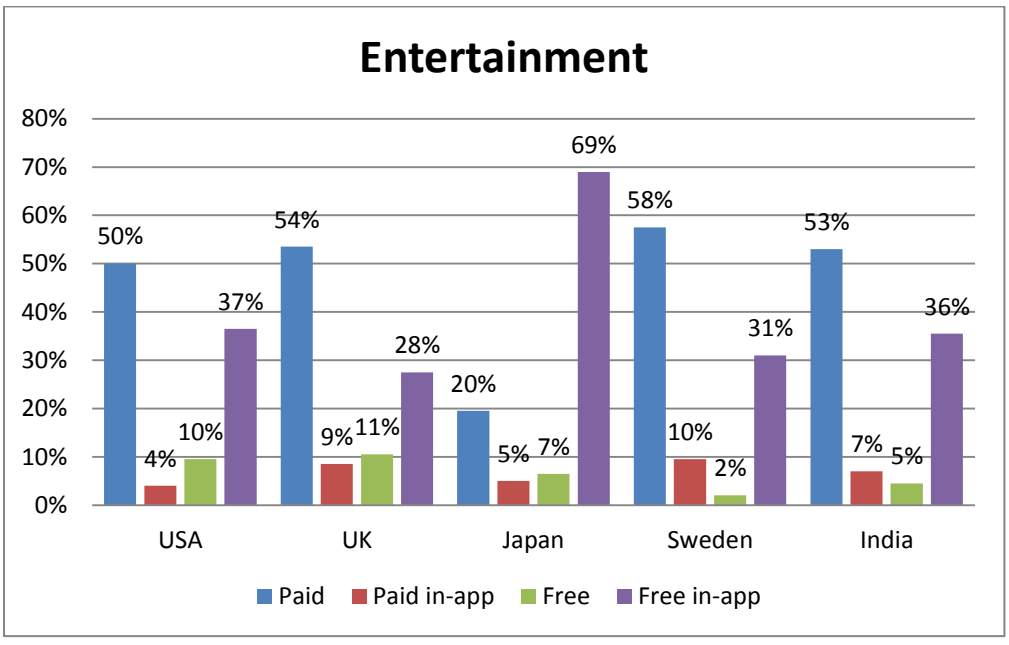
Users of iOS and Android spend 24 % of their time in applications within the social networking sector (Appendix 6). The spread among business models for the social networking sector is wider compared to gaming; however, the "Free in-app" business model is the most common model in this sector as well. The presence of "Paid" applications are however quite high, ranging from 24-47 %. Sweden is an out layer here with a slightly higher presence of "Paid" applications than "Free in-app" (Appendix 2).



Picture source: own illustration, data extracted from AppAnnie (AppAnnie.com, 2013).

Entertainment

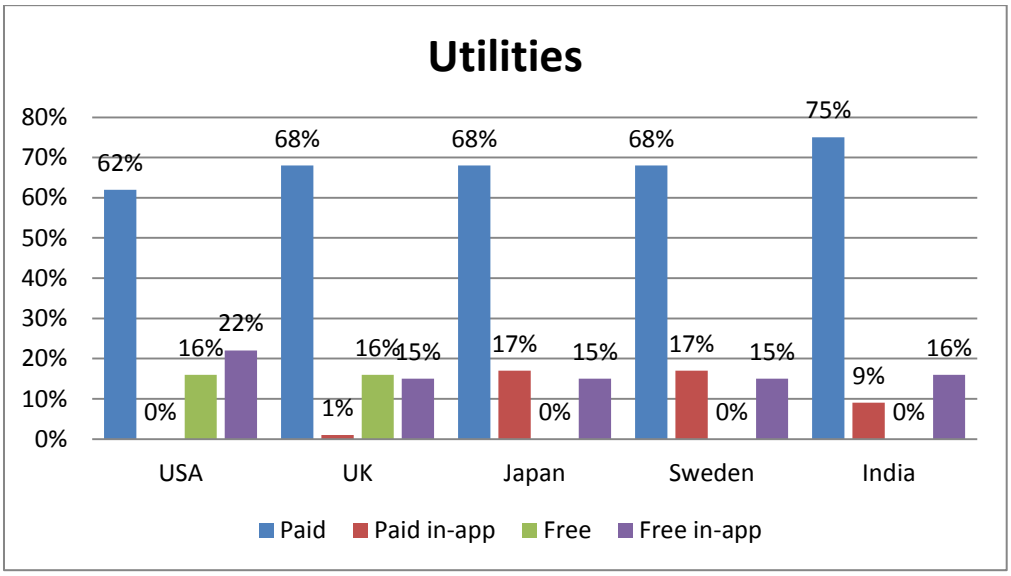
Users of iOS and Android spend 8 % of their time in applications within the entertainment sector (Appendix 6). "Paid" and "Free In-app purchase" business models are almost in parity in this sector except for Japan. Japan is an out layer here, "Paid" applications make up 69 % and only 20 % are "Free In-app purchase" applications (Appendix 5).



Picture source: own illustration, data extracted from AppAnnie (AppAnnie.com, 2013).

Utilities

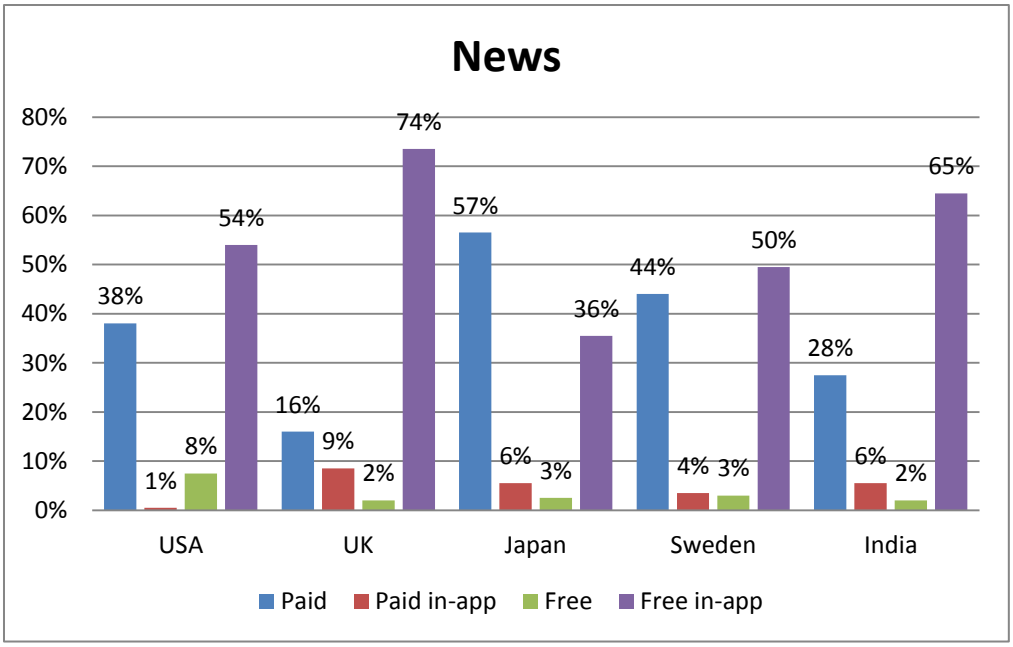
Users of iOS and Android spend 8 % of their time in applications within the utilities sector (Appendix 6). AppAnnie could not present data for the Android OS for this category. However, for iOS, the "Paid" business model is very common, ranging between 62-75 % for the countries studied. The "Free" applications however, represent 16% for USA and UK but 0% for Japan, Sweden and India. The data for the "Paid in-app" business model on the other hand show that Japan, Sweden and India uses this business model instead of the "Free" model, ranging from 9-17 %.



Picture source: own illustration, data extracted from AppAnnie (AppAnnie.com, 2013).

News

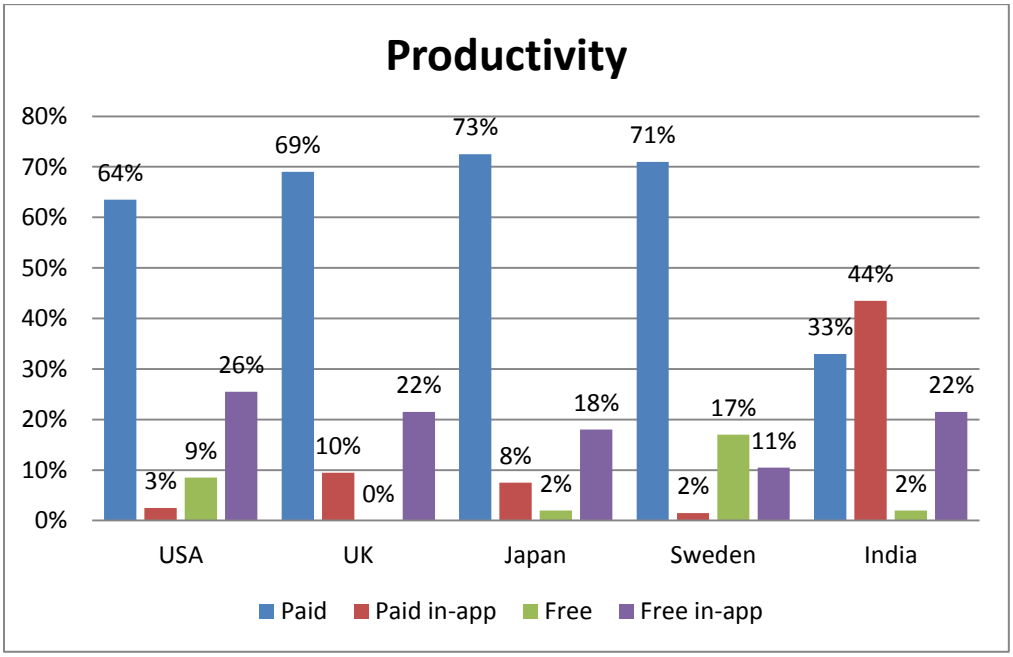
Users of iOS and Android spend 2 % of their time in applications within the news sector (Appendix 6). The two most common business models in this sector are "Paid" and "Free In-app purchase." Japan shows a higher share of "Paid" business models than the "Free in-app" model which is most common in all other countries covered. The UK has highest presence of the "Free in-app purchase" business model of all countries studied (Appendix 4).



Picture source: own illustration, data extracted from AppAnnie (AppAnnie.com, 2013).

Productivity

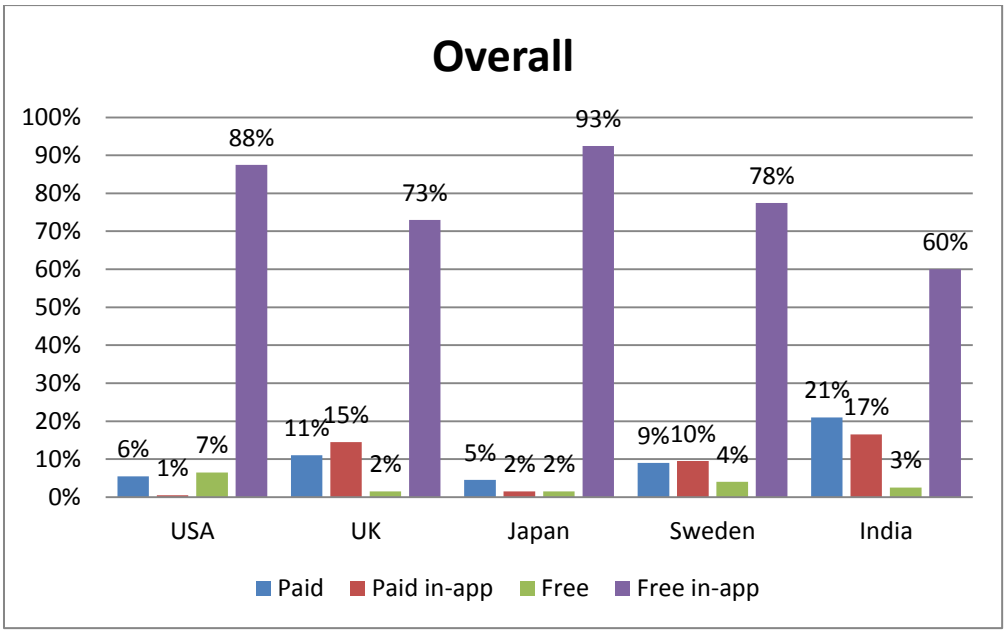
Users of iOS and Android spend 2 % of their time in applications within the productivity sector (Appendix 6). The "Paid" business model is the most common model in all countries except from India where the "Paid in-app" model is most common (Appendix 3).



Picture source: own illustration, data extracted from AppAnnie (AppAnnie.com, 2013).

Overall

When examining the material independent of sector affiliation it is clear that the "Free in-app" business model is the most common one in all geographical markets. However, India shows the lowest share of the model and has instead a higher share of "Paid" and "Paid in-app" business models.



Picture source: own illustration, data extracted from AppAnnie (AppAnnie.com, 2013).

4.3.8 B2B

Business apps are a segment in the app industry growing markedly. Application developers have previously enjoyed the success of Apple's app store and Google's Android Market when providing their apps to consumers. Nevertheless, the business segment is now catching up due to enterprises extensive use of smartphones. This market holds lucrative opportunities for developers targeting the business segments of the app market.

According to a survey from Partnerpedia, the interest in offering mobile app solutions to businesses is growing fast. The survey indicated that developers are currently, or are planning, to offer mobile app solutions to business customers. What are then the reasons for the moving focus from consumers to business apps? Vanessa Ho, online community manager at Partnerpedia, discusses this trend and points towards an overloaded market for consumer apps and developers now turn to business apps which offer more generous profit margins. Further, 28 % of the respondents from the Partnerpedia survey (+200 respondents) indicated an expected growth beyond 50% for their mobile businesses in the next three years.

When developing applications for businesses, the revenue models differ from the ones used for customer apps. Instead of paying for the app in an app store or purchasing services "in-app," payment are made either as a project cost payment, a subscription or a combination. Rosinder CEO at the app development company Magisty explains that their development projects are divided into modules where the customer can chose the features of the app. All kinds of functions are possible to add and have different prices whereby the customer builds their own app and thereby determines the price by how technically difficult the solution is. Amilon, CEO of app development company Vitamin, describes a somewhat similar model for their app development projects but with less focus on modularity and instead adds a monthly subscription fee for service and maintenance for many of their apps. Rosengren, CEO at Netville, also applies payment for a whole project and adds that this model is suitable due the large variety of requests from the customers, both regarding complexity and working time. Rosengren (2013) further means that apps are the new marketing channel and that many of their projects are short term campaign apps used for marketing. This perception is supported by statistics from Flurry.com, indicating that this form of marketing is growing and that apps soon can be expected to reach their targeted audience through mobile applications just as often as through TV- and radio commercials (Gordon, 2013).

4.4 Mobile Applications Industry

Internet access was in 2005 almost entirely based on fixed access lines. Today however, mobile access has already surpassed that of fixed access and is expected to grow drastically in the following years (Appendix 9). The Global revenue from app stores is expected to reach 25 billion USD in 2013 (Lessin & Ante, 2013). Even as smartphones are beginning to penetrate the "late majority" of consumers in the developed world (ComScore, 2013), the expected saturation of application related revenues has not yet been experienced. The fast adoption of tablets just after smartphones has spurred on the market for mobile applications and prevented the expected decline (Khalaf, 2013).

The number of applications available in the Apple app store has risen from 28.000 in Mars 2009 to approximately 800.000 in January 2013. Those numbers are in parity with the availability of applications on the second runner up app store, Google play, rising from 2.000 in Mars 2009 up to approximately 700.000 applications in January 2013 (Appendix 2).

Further, Flurry Analytics has measured over a trillion events from over 250,000 applications, created by more than 85,000 developers. Events are defined as "actions completed by consumers inside apps such as completing a game level, making a restaurant reservation or tagging a song". The chart in appendix 3 shows the growth in events tracked by Flurry Analytics since May of 2008 to November of 2012 (Appendix 3). From close to no events in May 2008 it reached over one trillion events in November 2012. Flurry Analytics consider this growth reflective of the growth of the app economy (Khalaf, 2012).

Smartphones and tablets are now radically reshaping how content and media is consumed. Media consumption on mobile devices in the U.S is now at 12 %, a triple increase since 2009 (Appendix 8). In 4 out of 5 minutes, smartphone users engage in content via applications rather than via the mobile web. And since smartphone users only use a few applications on their devices per day (Appendix 4), they spend more time in applications developed by major media brands rather than with the long tail of brands (ComScore, 2013).

Further, consumers continue to use their applications more frequently (as demonstrated in appendix 4) and 63 % of the applications run on Android and iOS devices in Q4 2012 were not used on a device earlier in the year. Since consumers continue to use their applications more frequently and are still willing to adopt many new applications, the applications market is still expected to expand and generate many new innovative applications (Khalaf, 2013).
On smartphones, browsing the Internet, checking social networks, listening to music and playing games all get more attention than making calls. Smartphones are going beyond communication and entertainment and has entered the domain of everyday activities and chores (G. Vision Mobile, 2012). However, appendix 6 shows that 50 % of time spent in mobile applications is across gaming and Facebook alone, followed by entertainment and utilities (Farago, 2012) (Appendix 6).

4.4.1 Value Migrates to the Mobile Application Industry

Most industries are on a crash course towards mobile applications. Value is expected to migrate from many industries to the mobile sphere including medicine, tourism, media and hospitality (Kamerick, 2012). Other industries too, such as the navigation industry, has experienced great outflow of value in recent years. The navigation industry has been very dependent on hardware sales of navigation devices. The introduction of app stores however, drove the value to software based handset navigation, commonly offered for a fraction of the

price when compared to traditional navigation devices (Qing, 2011). Moreover, the video game software industry is experiencing the same decline in revenues. The total value of the industry has declined with 46 % since 2008. Consumers are playing more games than ever before but the value is migrating to mobile gaming (Campbell, 2012). Mobile gaming jumped 16 % in 2012 to $5.92 billion.

Retail is yet another industry disrupted by mobile applications. Customers can go to a store, test the product, then look for the best price and order the product from someplace else using a smartphone. In 2012, 33 % of customers made an order online after first had looked at a product in store (Bensinger, 2013).

4.5 Glocal

Due to globalization, applications from companies such as Google and Facebook are dispersed all over the globe with no problems to achieve local adaption. However there are other types of applications that demand a higher rate of adaption to local needs. The term "glocal" is therefore suitable, as it merges the two concepts, global and local, into one. Differentiated local markets needs to be targeted with tailored advertising from a global or near-global basis (Ronaldson, 2012). Dumitrescu & Vinerean describes it "think global, act local". Applications used for bookings of different types, such as taxi, restaurants or local traffic, in different areas, might need a glocal focus. Applications like these will be suitable for one area but not for another. Factors such as language, culture, business environment, regulations, consumer behavior, and promotion channels effect how applications are developed and distributed. These implications generate unsupplied local markets and this is where developers have a possibility to successfully meet demand if adopting a glocal strategy (A. Vision Mobile, 2012).

Today, North America is dominating the rate of global downloads followed by Europe and Asia (A. Vision Mobile, 2012). These numbers are likely to be correlated to smartphone penetration rates which are higher in these regions.

Difficulties with localization and adaption to culture and language are the most challenging barriers to overcome in order to supply the demand for applications in foreign markets. The Asian market is an example of a market that is difficult to enter due to these circumstances. According to a survey conducted by Vision Mobile in 2012, covering application language

and region of origin, 85% of the respondents published their applications in English, 21% in Spanish and 16% in Chinese. If comparing these indicative numbers to the size of population speaking a specific language, it becomes clear that there is an imbalance in the number of application developers targeting user's native languages (Appendix 13).

Moreover, adaption also includes specializing the content, the colors and the icons, the whole application experience has to be modified in different markets such as Asia and the Middle East (A. Vision Mobile, 2012). Furthermore legislation is a barrier. Google play is not allowed in China, and 600 million downloads has been provided by the network operator China Mobile's app store (A. Vision Mobile, 2012).

4.6 Emerging Markets

Today the global web traffic stems 15% from mobile users (Blodget, et al., 2012). In the near future, new apps will be produced in emerging markets and the next 10 million apps are according to Vision Mobile (2012) going to come from the BRIC-countries (Brazil, Russia, India and China) (Appendix 11). Three factors are determining the demand for applications in these countries; smartphone penetration rate, user engagement and total addressable market of smartphone subscribers in a country (A. Vision Mobile, 2012).

The opportunities in emerging markets appear huge (Sandle & Wolde, 2013), and figures from Business Insider (Appendix 10) also depicts emerging markets as huge potential markets. Steven Elop, CEO for Nokia, further says that being the world's second-largest mobile market after China, "India is very important" (Channel NewsAsia, 2013). The former mobile market leader Nokia is now going for emerging markets and recently revealed news about their aim towards low-end developing markets with a new phone and OS platform (Judge, 2013).

To build new telephone networks is expensive in emerging markets and smartphones is expected to become the most used device connected to the internet for the next billion people in developing countries (Sandle & Wolde, 2013). Bloomberg reports that China and India has built 3G networks to cope with the amount of data a smartphone demands. Though to offers features that local populations can afford is the challenge for smartphone makers. IDC (as cited in Bloomberg, 2013) expects smartphone prices in China and India to be 20% lower in 2012 than the price level in 2010. The prices will, according to Zeb Eckert Bloomberg analysts, result in an increase of mobile data up to 77% in the next four years (Eckert, 2013).

Though Apple and Samsung are not benefiting from this shift, products are too expensive for people living in emerging markets (Blodget, et al., 2012) (Sandle & Wolde, 2013). According to Manoj Kohli, CEO of Indian operator Bharti Airtel, emerging market consumers were ready to go straight for smartphones, but when prices did not decline fast enough it was not possible to leapfrog basic phone models (Sandle & Wolde, 2013).

5.0 Analysis

5.1 Introduction

This analysis will follow the order of our theoretical framework. Initially, the birth of the applications industry and the impacts of disruptive innovation are analyzed. This is followed by an analysis of the industry environment today, as well as the future outlook for the industry. The analysis of the dynamics and environment of today will provide essential knowledge about the context of the applications industry, vital for our last part of analyzing suitable business models. In order to analyze these business models we have operationalized the theoretical variables from the theoretical framework into variables more connected to the specific context of our study.

Operationalization Table:

Theoretical framework	Measures
Value Creation	
Exposure to advertisement	Session time, frequency of use
Multi-price strategies	Layers
Network effects	Possibility of reach
Innovation life cycle	Lifetime
V*alue Capture*	
Pricing, Monetization	Revenue Model

With the help of these measures we have further developed a tool for analyzing the business models. This tool projects the presence of a measure in the respective application sectors. We expect the degree to which a measure is present in an application sector can help explain why a certain business model is used.

Sector\Measure	Session time	Fregeuncy	Layers	Lifetime	Possibility of reach	Revenue model
Gaming						"Free in-app"
Social Networking						"Free in-app"/ "Paid"
Entertainment						"Paid"/"Free in-app"
Utilities						"Paid"
News						"Free in-app"/"Paid"
Productivity						"Paid"

5.2 The Disrupted Value Chain

The rise and development of the applications industry was a result of the changing value chain structure within the telecom industry. Early in the 2000s, value chains in the telecom industry where integrated and did not allow for third party developers to contribute with applications. Hence, no room for other innovative ideas and solutions where asked for or allowed. Network

operators and handset manufacturers wanted to protect their innovations and restrict others from accessing them. Thus, the mindshare contributed to the industry only came from inside the industry itself. We believe these policies and mindsets inhibited the speed of innovation in the industry. Further, when purchasing a device, the customer had to accept that the only software provided for the device came from the device manufacturer or in some instances from the network operator's portals for applications. This created a cell phone experience with very little options for the individual user to tweak the user experience. We consider the excluding innovation environment in the industry, the limited options for user customization of devices and the limited access to other content as being the main reasons for the abrupt change that disrupted the industry in 2007-2008, since these are the characteristics driving the industry today.

When Apple disrupted the music industry it seems they learned just how powerful network effects can be and how important it is to offer customers multiple options for customization. iTunes became a huge success because of the size of the material offered in terms of available music. What they provided with the iPod and iTunes was a two-sided market where buyers and sellers could meet. They further provided a platform where product and money could be exchanged. This platform drove the sales of Apple's iPods which in turn provided their most important source of revenue. We believe Apple re-applied this concept into the telecom industry, although at a grander scale, and the result became very disruptive to the telecom industry.

The introduction of the app store offered users with choices that had never been previously offered in the telecom industry. iTunes offered a lot more choice for customers to choose from when buying music, but the app store expanded choice into so many more industries than just the music industry. The app store thus gave rise to a whole ecosystem where businesses from many various industries could participate and distribute their products and services. They also made important strides in enhancing the network effects in the industry by distributing SDKs so that independent developers could use and contribute to the platform. The app store was evidently another attempt to create a platform where buyers and sellers could meet. This business model made Apple very successful and competitors realized they had to follow Apple's example before Apple had locked in the entire market.

5.3 Applications Industry Dynamics

The new ecosystems in the telecommunications industry have been the foundation for the creation and evolvement of the applications industry. Apple introduced ecosystems as a strategy for business in the telecom industry and competitors came to follow very soon. The most dominant players in the industry are Google and Apple. These two controls almost the entire market creating a duopoly within the applications industry. Blackberry, the largest manufacturer of smartphones pre-iPhone, has since the introduction of the iPhone experienced a steady decline. On the other hand, Amazon and especially Facebook are increasing their power within the industry and are gaining markets shares.

All six of the companies examined have what is considered platforms though with different core businesses and strategies. The platforms described in the empirics are all designed in accordance with Cusumano's definition of a platform. Since the platform is a meeting point for two parts to exchange value, the number of participants on the platform is an essential part of the offering. If having a large installed base of users, the platform is more compelling and motivates participation. Everyone who owns a smartphone are using applications for a wide variety of things and the number of smartphone owners today are approximately one out of seven of the world's population. Owners of a smartphone are today spending an average of 158 minutes a day using applications. These applications are most commonly playing games, checking Facebook or browsing the web. Also entertainment, productivity and utility applications are used to a large extent. This makes the demand for applications high; they are being incorporated in people's everyday life and users are thereby gaining power. Since the consumers are requesting applications for almost everything it is essential for the platform owners to be able to provide appealing applications. Consequently, the need of developers rises in order to constantly update the app stores with new applications.

The power of network effects is a force all platforms have used to capture participants to their platform. Since the platform is a point of connection for users and developers the value of being connected to a certain platform increases as more users join it. We can see some being more successful than others creating network effects and we believe this is due to the different strategies employed by the platform owners.

Further, the value and importance of applications have become huge which is apparent; it has now grown into an industry itself. Therefore applications are important to increase the value of any platform.

Due to the differing business models these keystone companies have, the complexity of the industry dynamics is quite high. Thus we find it relevant to analyze how these companies have tried to employ different strategies so as to increase the attractiveness of their core businesses. Apple's and Blackberry's core business is hardware sales. They are both selling high-end devices along with an OS exclusive to their devices. Whether this restricted access strategy is successful or not is hard to conclude since Apple is very successful employing it while Blackberry is not. However, their strategies do vary from another point of view. Apple is trying to increase hardware sales through facilitating an ecosystem where applications are developed for the consumer markets. Blackberry on the other hand, even though through an ecosystem and platform, is firstly promoting development of applications targeted to a segment of business people. Blackberry's focus on the business segment has as well been accompanied by higher prices for the applications in their app store when compared to their competitors. The targeted segment is also quite excluding, resulting in fewer smartphone users benefitting from buying Blackberry hardware. Thus, the network effects created for the Blackberry platform is limited by the lack of interested consumers, which in turn limits the amount of developers interested in the platform.

Google's and Facebook's core businesses are advertising. Google has been very successful in selling advertisements on the web before and are now trying to reach the same success through mobile applications. Since Google's objective is to make their advertisements as visible as possible, they would benefit from allowing more people access to a smartphone where the advertisements could be viewed. In order to accomplish this, they have created an OS, Android, and basically given it away for free to device manufacturers if they agree to adopt the OS. This way, smartphone manufacturing costs go down generating cheaper smartphones, thus allowing more people access to a smartphone. Facebook's platform is rather different from the others and is providing a platform but no OS or device. To access the platform, users and developers can go through the web or through an application on a smartphone or tablet. Despite not having an OS or device on their own, the number of participants on Facebook's application platform is far from modest. Due to the huge number

of active Facebook accounts, the platform already has a great pool of users whereby the incentives to develop applications for Facebook is very high.

Windows has software licensing as their core business. In order to expand the sales of software licenses they have created their own OS, Windows Phone, which is optimized to run their software. They have as well partnered with Nokia on order to accomplish a reach and rapidly attract an installed base of users. However, due to their late entrance into the industry in 2010, they have not yet reached a very big market share.

Further, Amazon has retail as their core business. Amazon's strategy to increase the traffic and sales on their platform has been to develop cheap tablets. Much like the strategy of Google, Amazon is trying to increase the number of options for the consumers to reach their platform. Amazon is therefore selling cheap tablets under their name.

We can see some platforms more successful than others in creating network effects. Google created network effects by distributing their OS to several devices while Apple's network effects stems from the popularity of their devices. Google's strategy seems successful so far considering they recently passed Apple in total number of users. Blackberry was a big platform before the introduction of the iPhone but today they are struggling and the outlook for survival may not be the brightest at this time. Users and developers do not see the same value of connecting to the Blackberry platform. We believe this is connected to their strategy of targeting business customers. Even though Blackberry has reduced the prices in App World together with the release of the BlackBerry 10, the applications are still more expensive when compared to applications in Apple's and Google's app stores. Facebook's future as an application platform seems promising simply because of having over 750 million active users running their mobile application every month.

Moreover, we believe that the benefit of entering the market first have been ruling in this industry since the two dominating platforms where the first ones. We believe the early entrance in the smartphone market as number two after Apple are one reason contributing to the dominance of Android. Windows was not as quick in introducing this concept and is therefore far behind in the process of achieving market shares within the applications industry. They have partnered with a few handset makers rather recently and the development of the platform's progress is still to be seen. In our opinion it is difficult to compete with

Apple and Android at the moment but Microsoft might have a chance due to their power and influence. We also consider Facebook a valid competitor because of their large user base.

5.4 Future Outlook

The next step for the applications industry is to move towards where the future profits will be made; in emerging markets and the BRIC-countries. When stable connectivity is in place on these markets, the complementing products, the applications, have to be adapted to the context. The language barrier has to be passed and the cultural differences have to be considered when developing applications for these markets. In terms of language, the application codes are mostly written in English which may be a drawback for those who want to develop apps and do not know English. On the other hand it is hard for an English speaking developer to adapt the content of their applications to contexts of emerging markets if they do not master the language in the targeted market. We believe this will be a small matter though, especially if some of the leading platforms decide to go glocal, due to their available resources along with their financial strengths.

Currently another factor determining the success of moving the applications market into emerging markets is the prices of the devices. As for Apple, their core business is to offer high-end devices but the consumers in these markets are price sensitive and cannot afford to buy these expensive phones. Google may to some extent also suffer from this though they have a broader base of devices and will therefore still be able to capture market shares. Having made these considerations, we expect Google to be more successful in emerging markets in spreading their OS. It is a trade-off for them to modify their strategy to the extent where the prices of the devices becomes reasonable for these consumers. If Google allow their OS Android to be run on devices too simple, that might hurt their brand. On the other hand, if the OS is limited to devices that are too costly to these consumers Google will not reach sufficient sales. This can be an opportunity for Nokia to once again become a big actor in device manufacturing.

Additionally, legislation may be a factor interfering with platforms expansion to emerging markets. As mentioned Google has had difficulties in China which most likely must be a big problem for Google due to the enormous market and the potential the Chinese market possesses. These restrictions might be more difficult to solve and have to be considered important factors when targeting opportunities in emerging markets.

5.5 Application Business Models

In order to analyze the business models of mobile applications we have developed a tool to aid the structure and depth of the analysis. This tool was presented in the introduction to the analysis chapter and has been further utilized below.

Sector\Measure	Session time	Freqeuncy	Layers	Lifetime	Possibility of reach	Revenue model
Gaming	High	Medium	High	Low	High	"Free in-app"
Social Networking	Medium	High	Low	High	High	"Free in-app"/ "Paid"
Entertainment	Medium	Medium	Low	Medium	Low	"Paid"/"Free in-app"
Utilities	Low	Low	Medium	High	Low	"Paid"
News	Medium	High	Medium	High	Low	"Free in-app"/"Paid"
Productivity	Low	Medium	Medium	High	Low	"Paid"

The measures in the framework represent common traits that either unite or divide application sectors in terms of how they create value for their users. The most frequent revenue model, i.e. how value is captured, in respective application sector is presented to the right in the framework. If two revenue models are presented, the revenue model to the left is the most frequent model in that sector followed by the second most frequently used model to the right. Moreover, we have assumed that the degree to which a measure is present in an application sector can help explain why a certain revenue model is used.

Mobile application business models, especially in terms of how to create and capture value, have been examined for applications in two app stores, the Apple App store and Google Play. Our study was carried out with data collected from AppAnnie's analytics platform.

In the gaming sector the "Free in-app" revenue model is far more frequently used than any other revenue model. We believe this can be explained by the specific traits applications in the gaming sector possess. The session time, i.e. how long a consumer uses the application at any one time, is relatively long for gaming applications since the value derived from gaming applications is the joy of playing the game. However, we expect that the mere length of the sessions renders a medium frequency of use. The long sessions especially, and to some extent the medium frequency of use, enables the possibility of successful incorporation of advertisements in these applications. The user can be exposed to advertisements for a long period of time thus the impact of the advertisement on the user increases. Further, the number of layers in gaming applications is generally high. The layers are often characterized as game levels or number of remaining lives. An application with many layers has a good chance of utilizing in-app purchases as a source of revenue because in-app purchases allow revenues to be captured from the individual customer's willingness to pay. The lifetime of gaming

applications is often short because of the inherent possibility of getting bored with something that is used in long sessions at a time. The innovation life cycle is most often short in this sector due to vast amount of gaming application options. We believe the short lifetime of gaming applications advocates for a "Paid" revenue model due to the short amount of time the application has to collect revenues. Moreover, gaming applications most often include features which allow the user to communicate with other users through chat rooms as well as the ability to publish high-scores in social media applications. This creates a greater possibility for the application to reach possible users and thereby strengthens the applications network effects. Except for the "lifetime"-variable we conclude that the use of the "Free in-app" revenue model is well suited for gaming applications.

Social networking applications use the "Free in-app" and "Paid" revenue models and the "Free in-app" model is slightly more common. Social networking applications are generally used frequently but in medium length session. Hence, advertisements would be suitable in this respect. Further, the number of layers in social networking applications is usually few which advocate against an in-app purchase option. However, the lifetime of these applications is commonly long due to the extensive network effects that characterize social applications. The long lifetime speaks for a "Free in-app" revenue model because revenues can be collected over an extensive period of time. Further, the strong network effects related to social applications further advocates for a "Free" revenue model with advertisements because a large user base in combination with high frequency of use generates a lot of exposure time to advertisements. Hence, we would suggest social application developers to adopt a "Free" alternatively a "Free in-app" revenue model. The "Paid" revenue model is quite common in the social networking sector but we find no bearing of this choice in relation to theory.

The table show that the most common revenue model in the entertainment sector is "Paid" followed by the "Free in-app" revenue model. We expect entertainment applications to be used somewhat frequently and in medium-length sessions in relation to the other sectors. Therefore the "Free" revenue model might be viable. However, the medium length lifetime and the low possibility of network effects surely dismiss this notion since advertisements need long sessions from many users to generate reasonable amounts of revenues. Further, this sector is characterized by few layers of the applications which means that in-app purchase options is not preferable. The possibility of reach for applications in this sector is low because there are not many circumstances in which a higher number of users increase the value of

using the application for the individual user. The use of the “Paid” revenue model is thus understandable.

Revenues from utility applications most commonly stem from the “Paid” revenue model. This is in line with what the traits of such applications suggest. The session times, frequency of use and possibilities of reach are in relation to other applications low which means that collecting revenues from advertisements is hard. However, the lifetime of these applications is quite high which advocates for an advertisement based model. Regardless, the little chance of exposure time to advertisements dismisses that alternative. The “Paid” revenue model thereby seems to be reasonable and consciously chosen in accordance with the specific traits of utility applications.

In the news sector, the “Free in-app” revenue model is slightly more common than the “Paid” revenue model. The medium length session time and the high frequency of use does suggest a “Free” revenue model including advertisements however the low possibility of reach do decrease the advantage such a model. The medium amount of layers is explained by the common trait of paying for premium articles and the like and this do advocate for in-app purchase options. In conclusion, the “Free in-app” revenue model does seem preferable due to the advertisement exposure time and presence of layers.

In the productivity application sector the “Paid” revenue model is most common. This can be explained by the low session times as well as the low possibility of reach. Further, there are possibilities of in-app purchase options due to some presence of layers. The most advantageous revenue model for this sector thus seems to be the “Paid in-app” revenue model. Hence, for this sector we cannot see that the choice of revenue model is explicitly chosen according to the specific traits of the applications in the sector.

It seems as if business models are consciously chosen in respect to the specific traits applications in a certain sector possess. However, the results are not conclusive. Social- and productivity applications do not seem to have chosen business model in relation to the traits of the applications in their respective sector. More importantly however, is the fact that there are connections between choice of business models and application sector affiliation. The gaming- and utility sectors especially, show that business models are connected to specific

sectors and that these business models are chosen in relation to traits that applications within the sectors have.

Business models in relation to the geographic market targeted did show a uniform relationship. Applications over all markets included in the survey showed a preference for the "Free in-app" business model. However, it did vary to some extent. India for example only reached 60 % of the "Free in-app" business model. India instead showed a higher presence of the "Paid" and "Paid in-app" business models. In India, the most common business model for productivity applications was the "Paid in-app" business model. In all other countries, the "Paid" business model was distinctly more popular in this sector. Further, Japan proved to be quite different in terms of entertainment applications with 69 % of the "Free in-app" business model. The closest follower only had 37 % of this business model in this sector. The important findings here are that there are some differences application developers should consider when designing their business models in order to capture the most possible value from their users. The reasons for these differences are not clear to us and are in need of further studies. Perhaps, however, it is because the regulatory systems vary between countries. Maybe the convergence of technologies this industry has created has left the regulatory systems in some countries lag behind these technological developments.

The B2B application industry does now seem to be the part of the applications industry many developers are targeting. Businesses need to stay relevant and be present in the channels people are using. Media publishing houses and news organizations once had to adapt their distribution from print to web and now it seems they have to expand their channels once again to reach their customers. Therefore, we can see an increased demand for applications developed for businesses. The difficulties of making money on applications offered in app stores further contribute to the trend of increasing developer attention to the B2B application industry.

6.0 Conclusion

6.1 Introduction

This final chapter will present to most important findings in this thesis. We hope these findings will shed some light on the current dynamics of the applications industry as well as contribute with evaluation of application business models.

6.2 The disrupted value chain

The rise and development of the mobile applications industry was a result of the disruptive innovations by Apple. The introduction of a platform, functioning as a two-sided market, attracted lots of mindshare to the telecom industry which spurred innovation. Consumer options and customization increased because third party developers were given the opportunity to contribute to the platform. Through this, Apple managed to create strong network effects previously never experienced in the telecom industry.

6.3 Application industry dynamics

The dominant players in the applications industry are Apple and Google. They have almost created a duopoly within the applications industry. Further, the other relevant players are Blackberry, Microsoft, Facebook and Amazon. Blackberry has been in decline since Apple disrupted the industry. Microsoft is increasing its market share although at a slow rate. Facebook and Amazon are seen as viable competitors due to their large installed user bases, especially in the case of Facebook.

These companies all compete to become the dominating platform in order to increase the attractiveness of their core businesses. However, their core businesses are not all the same. Apple and Blackberry are trying to create an attractive platform in so that they can sell more of their core product, their hardware. Apple is focusing on the whole scale of the consumer market while Blackberry has a focus on business people. Google and Facebook are doing it to increase their revenues from their core business of advertising. Google's strategy is to spread their OS to as many screens as possible while Facebook is leveraging their enormous installed user base. Moreover, Microsoft is trying to attract users in order to sell more of their software licenses while Amazon is trying to simplify access to their online retail platform. Microsoft entered the race for platform domination rather late in 2010 and has now partnered with Nokia

in order to rapidly increase their user base. Amazons strategy on the other hand is to produce low cost tablets in so that customers can reach their retailing platform through multiple channels.

Some of these companies are more successful than others in creating network effects. Google has created network effects by distributing their OS to several devices while Apple's network effects now stem from the popularity of their hardware. Google's strategy seems successful so far since they recently surpassed Apple in terms of total number of users. Blackberry's strategy does not however look promising, their business-centric strategy seems to be excluding too many consumers and the prices of their applications are higher when compared to competitors. Facebook's future looks promising due to their huge size of their installed base of users.

6.4 Future Outlook

The future growth of the applications industry is expected to come from emerging markets. Barriers that need to be overcome to reach those expected profits are language barriers and other cultural barriers. These markets are very price sensitive why we expect Apple, who sells high-end hardware, to be less successful on these markets. Google on the other hand has the advantage of having their OS incorporated in a wider spectrum of devices. Microsoft might be a valid competitor on these markets because of their partnership with Nokia. This is expected because Nokia is already big in emerging markets.

6.5 Application Business Models

We have found that there are a connection between application sector affiliation and business models. The "Free in-app" revenue model is the most common business model over all sectors and geographic markets. However, business models associated with high grossing applications do differ depending on application sector affiliation. Gaming and utility applications demonstrates the strongest evidence of this because one certain revenue model show great superiority in frequency in the respective sectors. Further, the business models in these sectors are as well very much adapted according to the common traits each sector inhibits which mean that the business models employed are consciously chosen to fit the specific sector which the application belongs to. We also found that, although to a lesser extent, that business models for high grossing applications differ depending on geographic market targeted. India for example, shows a significantly higher frequency of the "Paid in-

app" revenue model. Nevertheless, why certain business models are more successful for certain geographic markets needs to be further studied.

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Appendices

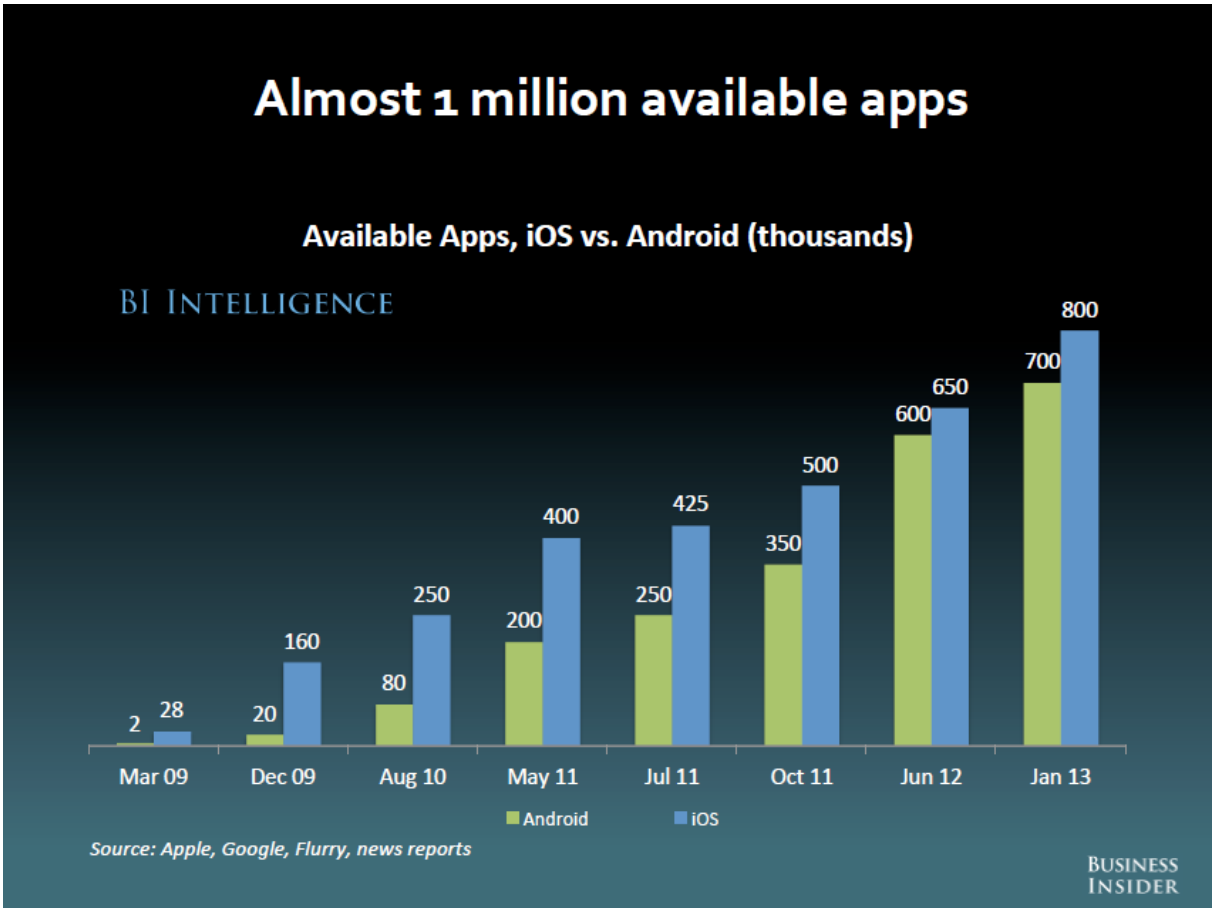
Appendix 1

Smart Connected Device Market by Product Category, Shipments, Market Share, 2012 (shipments

Product Category	2012 Unit Shipments	2012 Market Share	2011 Unit Shipments	2011 Market Share	Year-over-year Change
Smartphone	722.4	60.1%	494.5	53.1%	46.1%
Tablet	128.3	10.7%	72.0	7.7%	78.4%
Portable PC	202.0	16.8%	209.1	22.5%	-3.4%
Desktop PC	148.4	12.4%	154.8	16.6%	-4.1%
Total	**1201.1**	100.0%	**930.4**	100.0%	**29.1%**

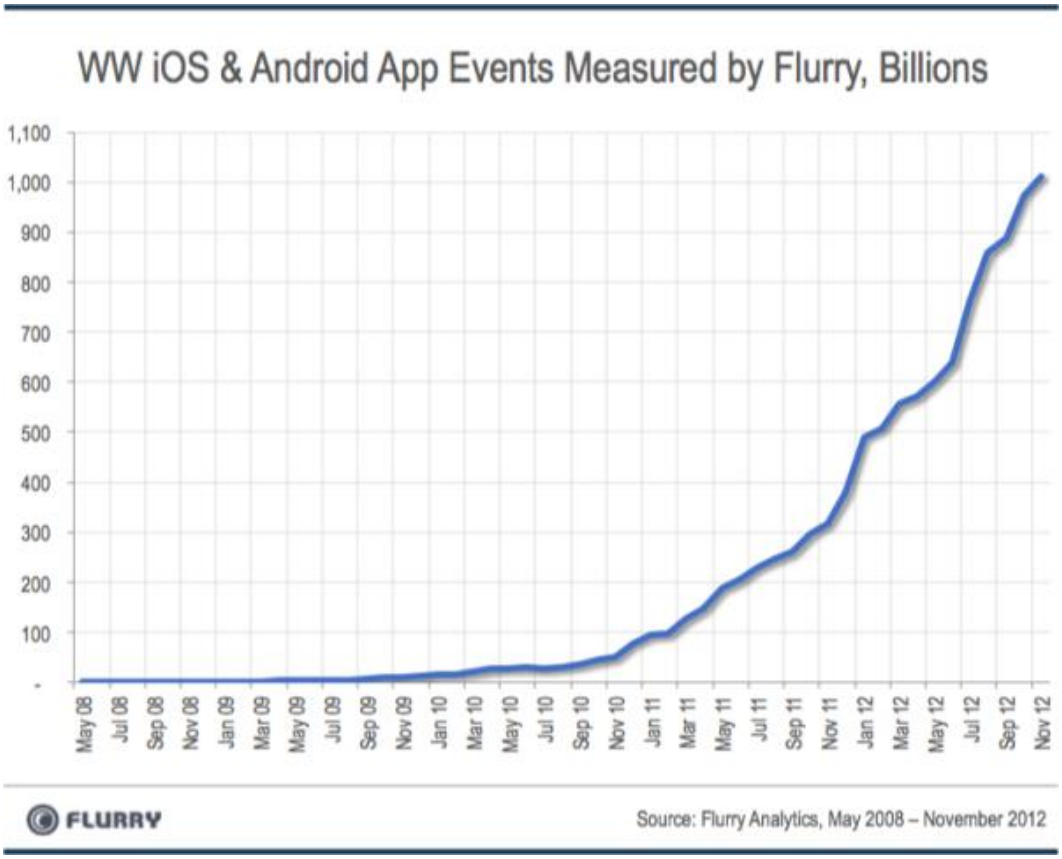
Picture source: (Wauters, 2013)

Appendix 2



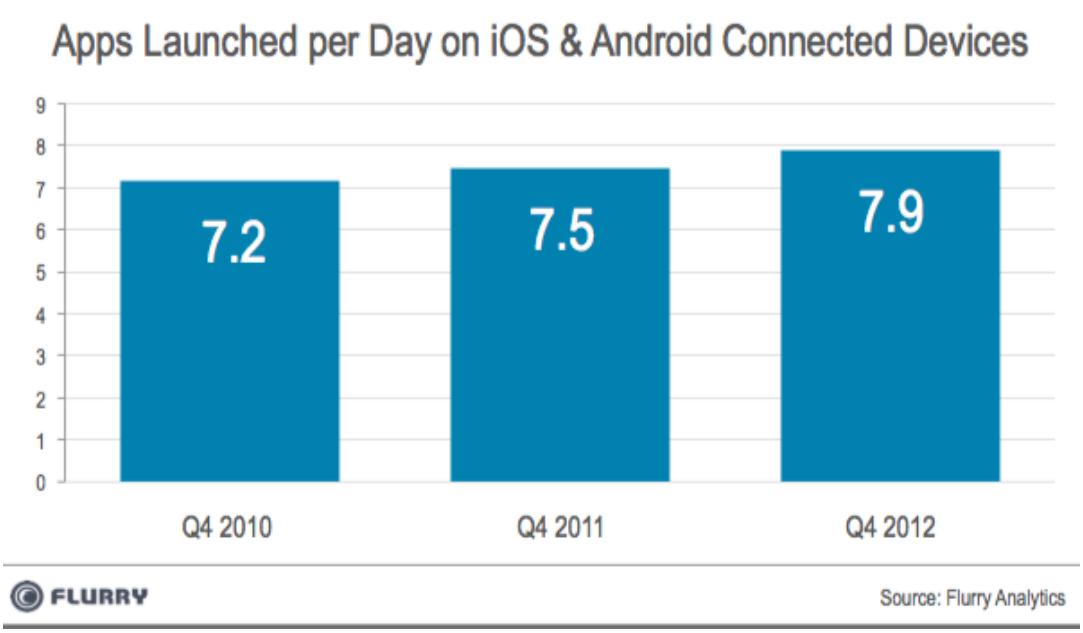
Picture source: (Blodget, et al., 2012)

Appendix 3



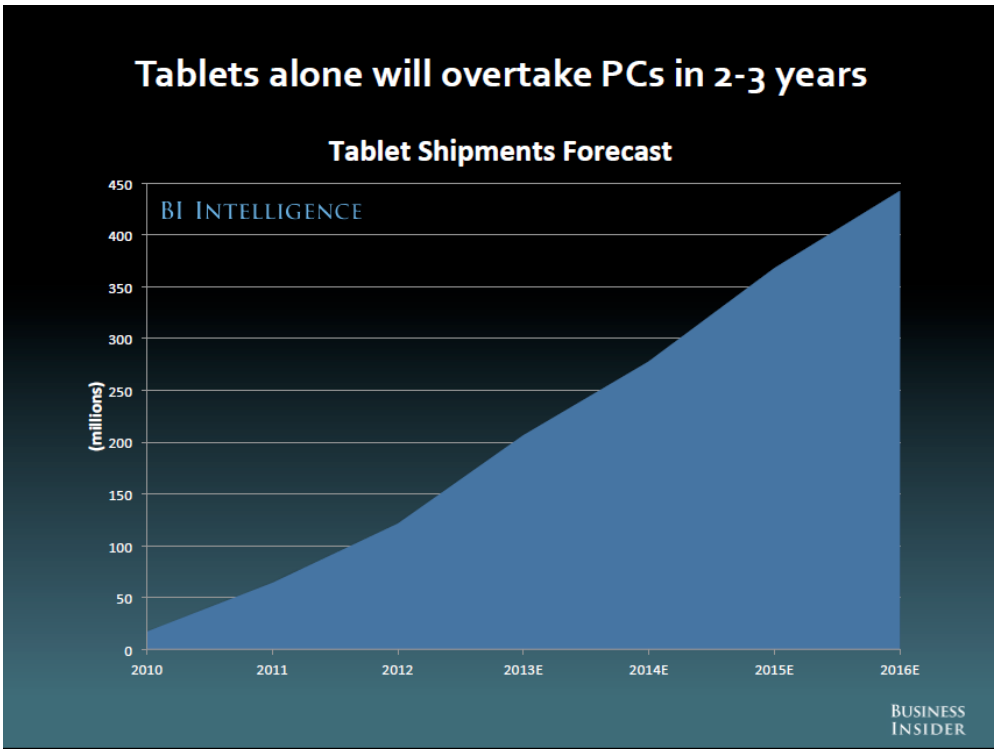
Picture source: (Khalaf, 2012)

Appendix 4



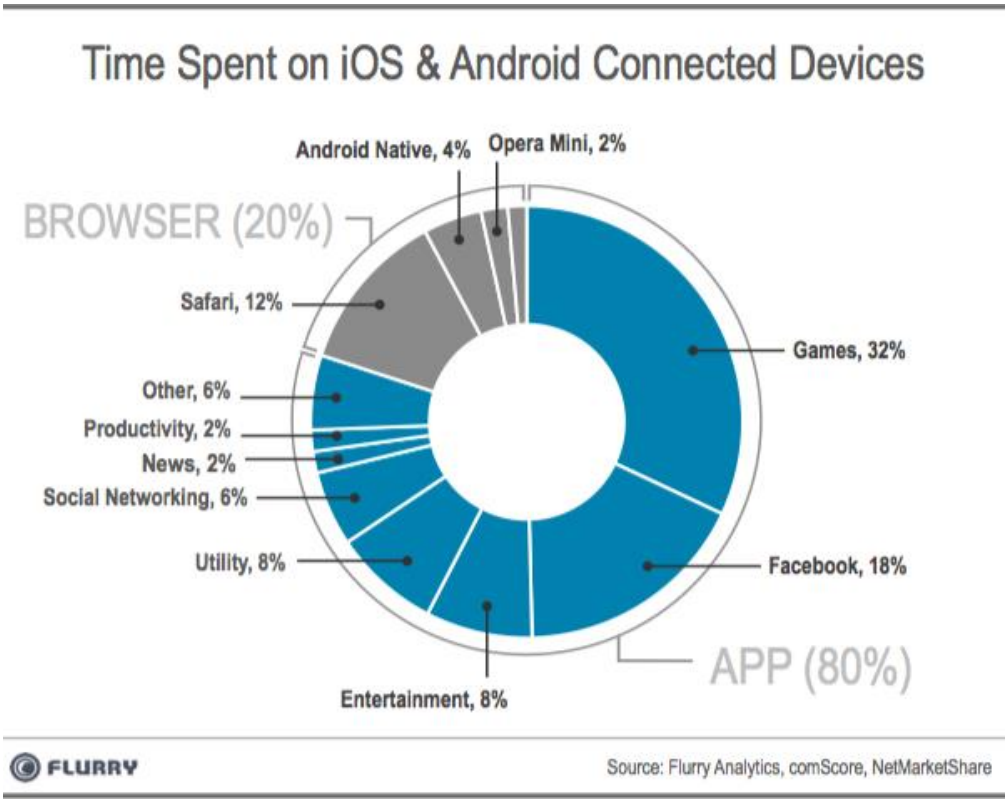
Picture source: (Khalaf, 2013)

Appendix 5



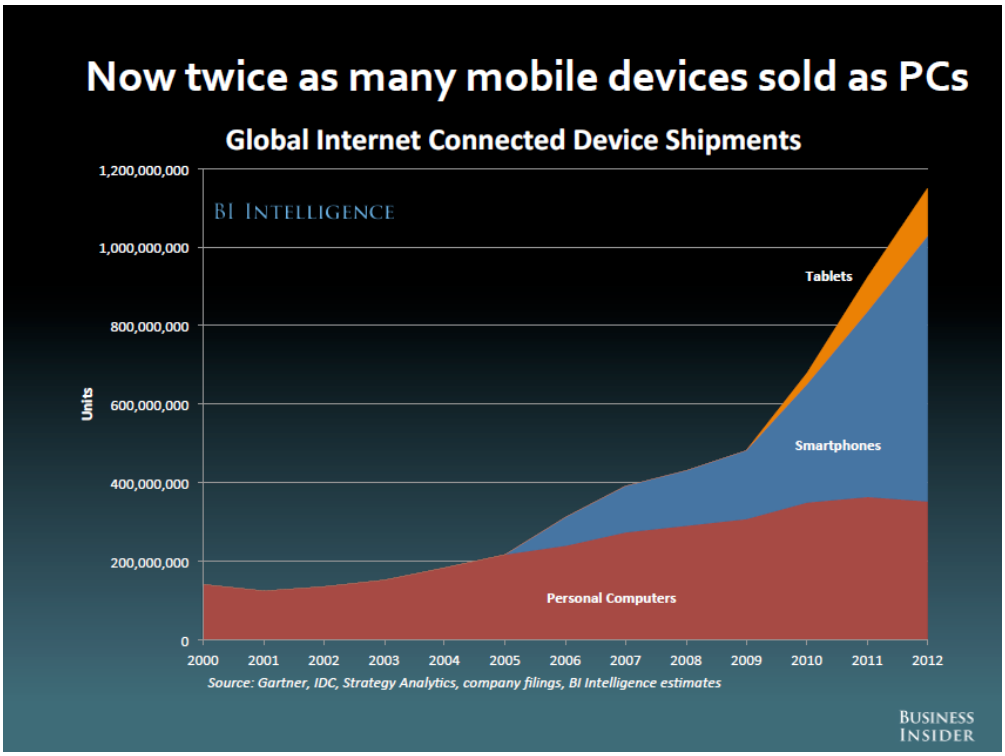
Picture source: (Blodget, et al., 2012)

Appendix 6



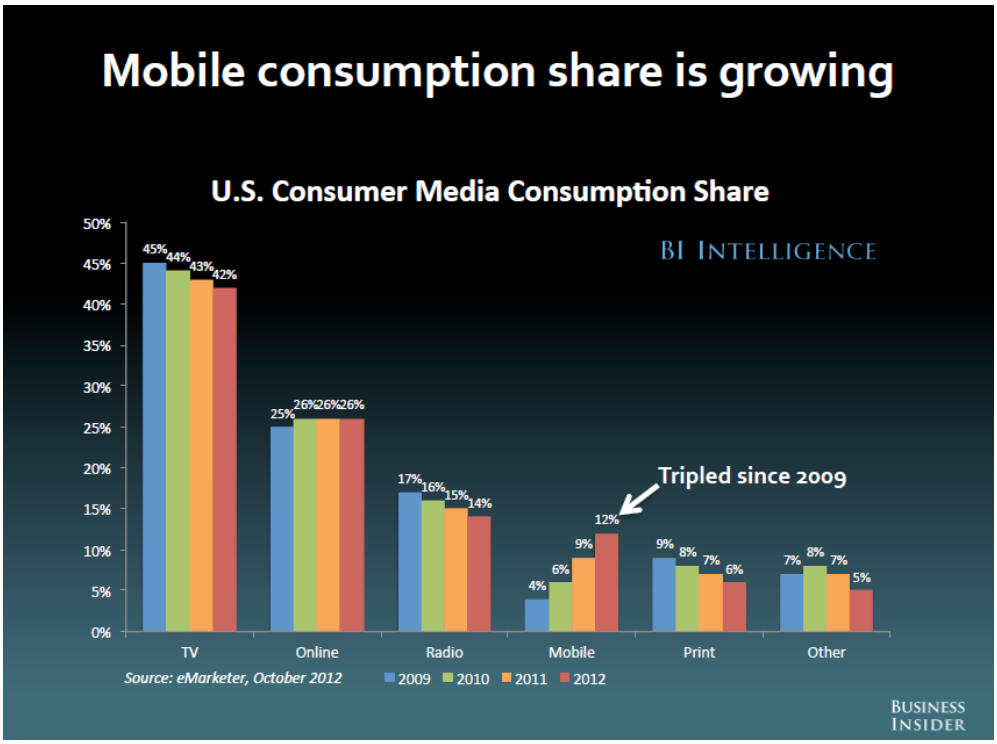
Picture source: (Khalaf, 2013)

Appendix 7



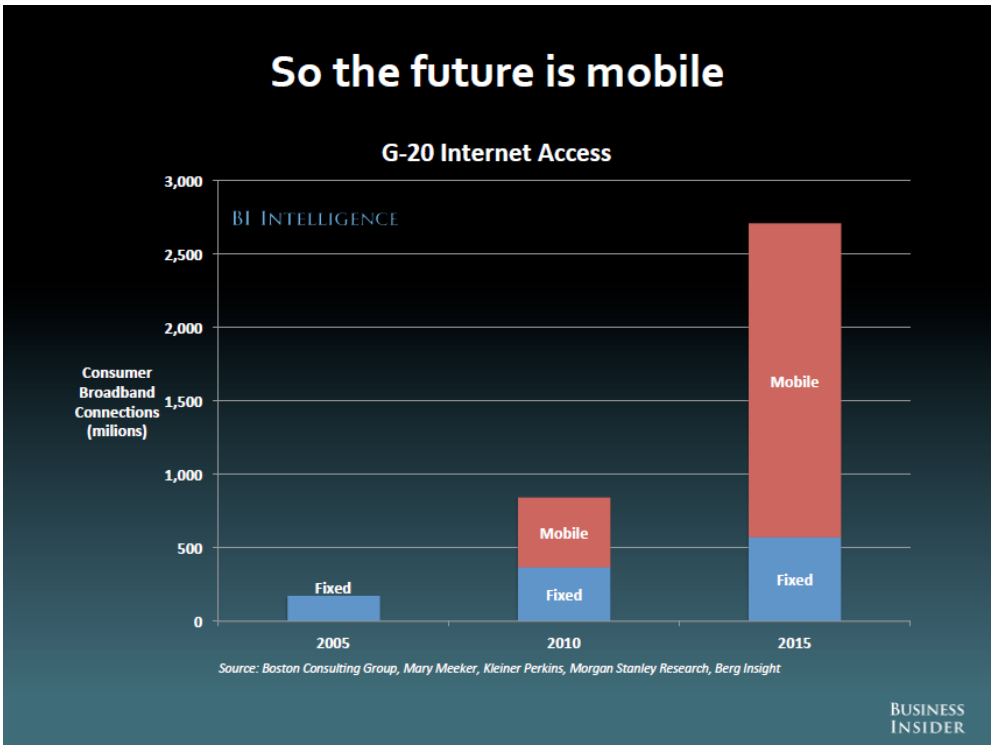
Picture source: (Blodget, et al., 2012)

Appendix 8



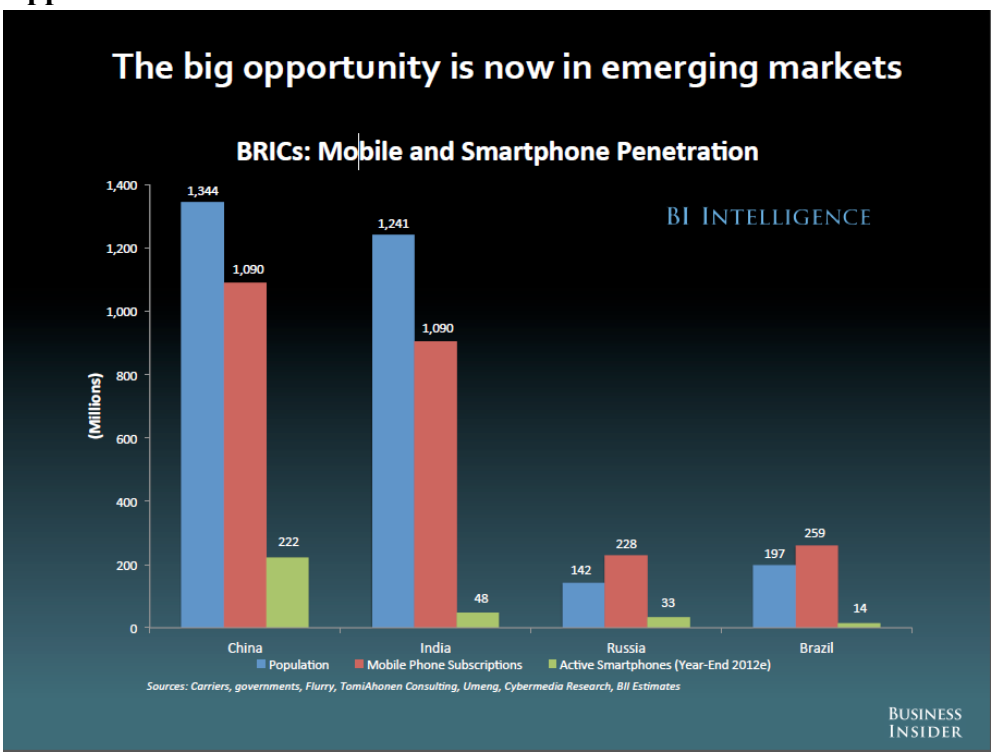
Picture source: (Blodget, et al., 2012)

Appendix 9



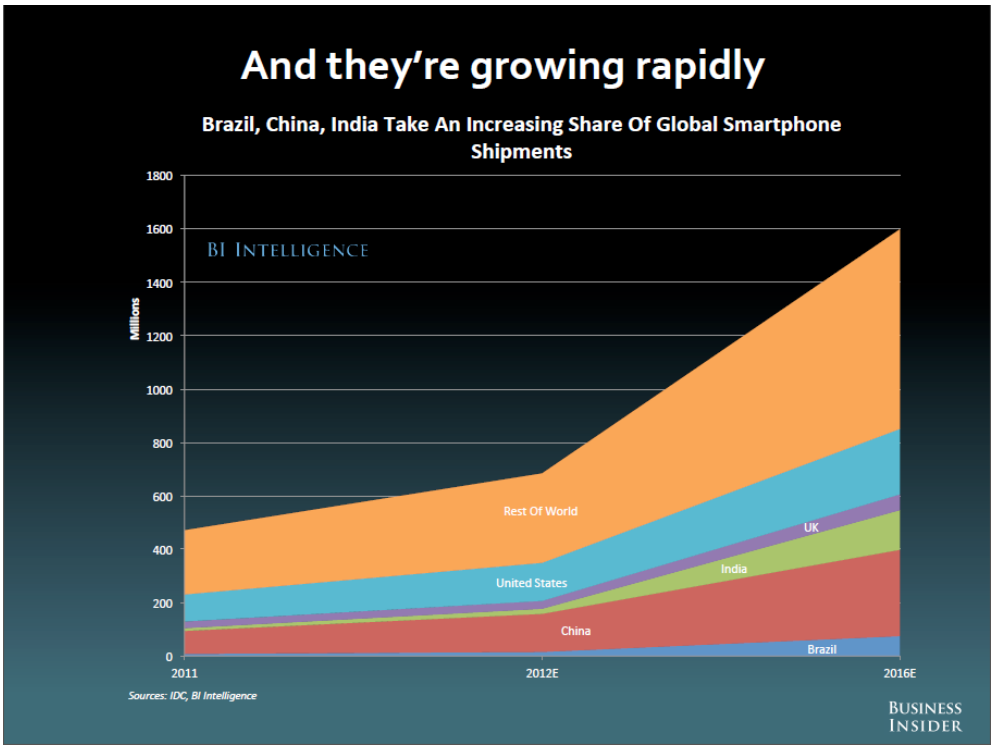
Picture source: (Blodget, et al., 2012)

Appendix 10



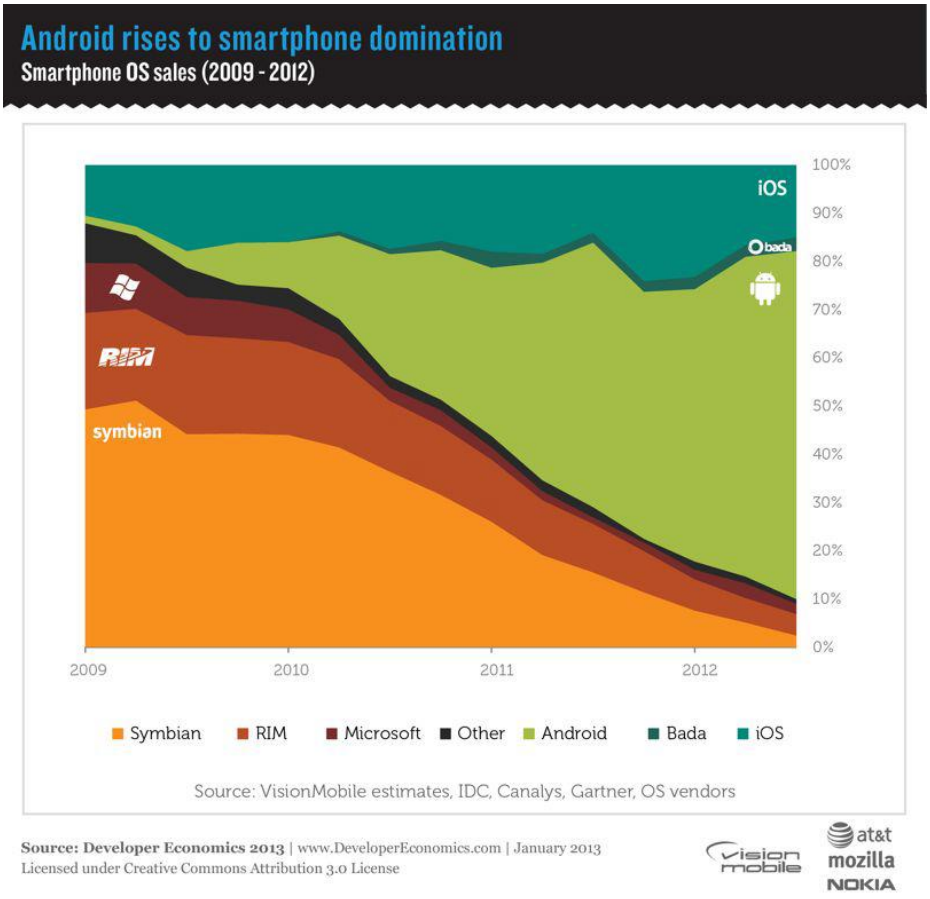
Picture source: (Blodget, et al., 2012)

Appendix 11



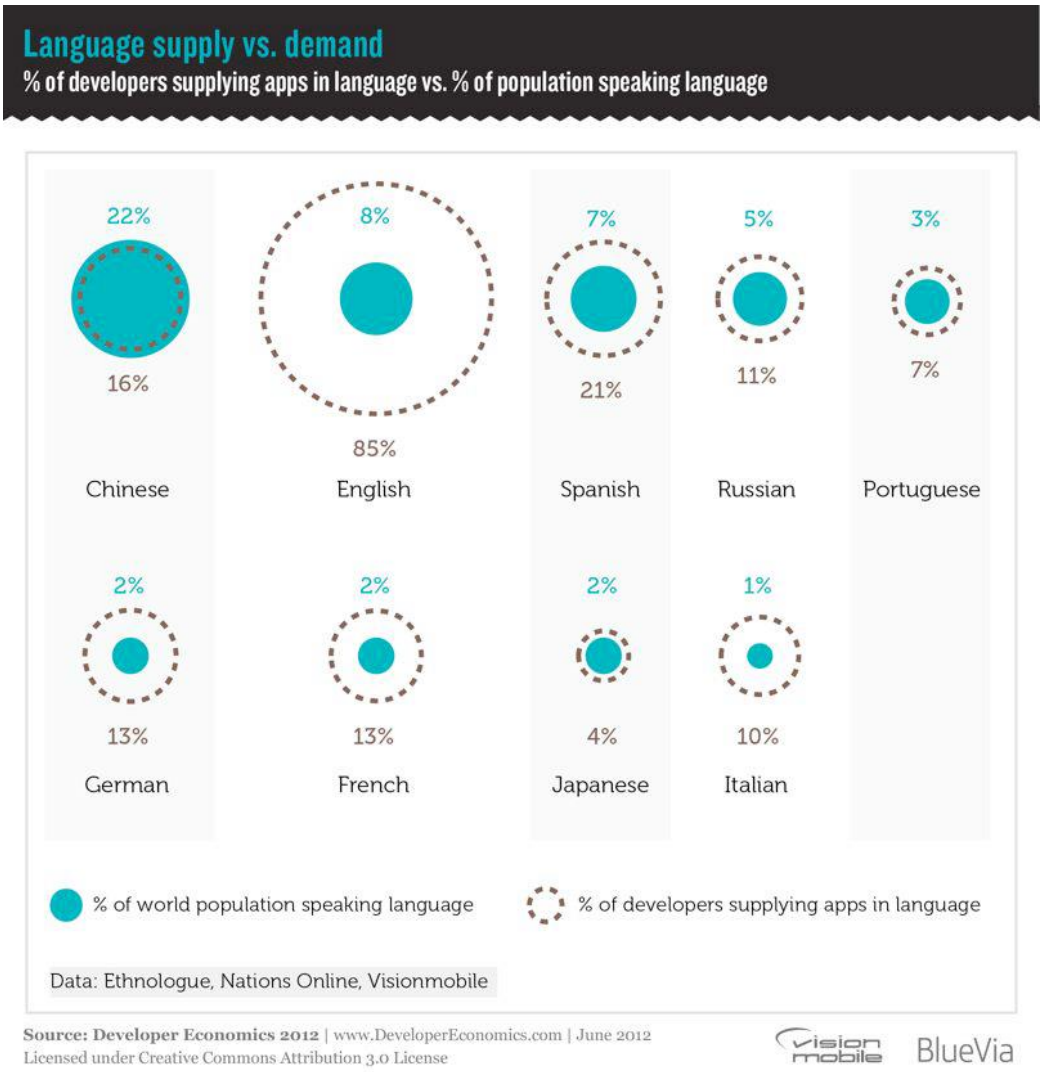
Picture source: (Blodget, et al., 2012)

Appendix 12



(A. Vision Mobile, 2013, p. 15)

Appendix 13



Picture source: (A. Vision Mobile, 2012)

Aim for profit

– Consider your application business model carefully

Smartphones are not most commonly used for making phone calls anymore; the applications are in focus now for browsing the internet, checking social networks, playing games and more. Over 800 000 applications are available in the two biggest app stores around, the Apple App Store and Google Play. The applications industry is a huge business; together all application platforms reaches revenue of 25 billion USD (Lessin & Ante, 2013). Even though the appearance of high revenues, it is hard to make money out of applications; 80% of the revenues in the applications industry are being extracted by only 4% of the application developers and two out of three apps actually never get downloaded. Therefore it is important to keep in mind that even though the technological solution of the application is outstanding, it will not be enough. A well thought through business model to support the technology is needed to generate revenues. When designing the business model for an application there are a few things you should know about the relation between type of business model and type of application. The choice of business model will most likely be ruling for whether you generate revenues or not. To get a better understanding about how to choose right business models for achieving high revenues, the findings of our study may come well in hand.

The study conducted covers the top 100 most grossing applications in the Apple app store and Androids Google Play store on April 4, 2013. The sectors in the study are those who people spend the most time using. On average smartphone owners spends approximately 158 minutes a day using applications. 80 % of this time is spent with mobile applications within the following sectors; games, social networks, entertainment, productivity and news. Within every one of these sectors we have analyzed what factors generated the following four business models; “paid”, “paid in”, “free” and “free in-app”. The data is extracted from US, UK, Japan, Sweden and India. In order to make it easier to evaluate the results from the study we created a tool for interpreting the factors affecting the choice of business model.

Sector\Measure	Session time	Freqeuncy	Layers	Lifetime	Possibility of reach	Revenue model
Gaming	High	Medium	High	Low	High	"Free in-app"
Social Networking	Medium	High	Low	High	High	"Free in-app"/ "Paid"
Entertainment	Medium	Medium	Low	Medium	Low	"Paid"/"Free in-app"
Utilities	Low	Low	Medium	High	Low	"Paid"
News	Medium	High	Medium	High	Low	"Free in-app"/"Paid"
Productivity	Low	Medium	Medium	High	Low	"Paid"

The different factors; session time, frequency, layers, lifetime and possibility of reach was evaluated in all sectors which generated the table above. The data extracted revealed the frequency of use of a business model in a certain sector. The presence of each measure gave us indications on why a certain revenue models were chosen.

The characteristics of the business models are presented here.

- The “paid” business model simply charges the customer a one-time fee. Once purchased, the customer has all the features the application offers.
- The “paid in app” business model has an initial one-time fee as well as in-app purchase options. This business model is a combination of the freemium and paid business models.
- The “free” app business model generates revenues by using a pay-per-click advertising model. This model makes the application totally free for the user but contain ads.
- The “Free in-app” also called the freemium business model has no upfront download cost but comes with various optional in-app purchase options. First, the user gets the free “basic” version of the application. Later, while running the application, the user is offered to purchase “premium” services.

User’s altogether for iOS and Android spend 32 % of their daily time using applications within the **gaming** sector. This makes the sector the most used within the applications industry. Our study shows that for the top 100 most grossing applications within the game sector the most common business model are “free in-app” where the use of this model ranges from 73-93 %.

The sector where users spend second most time is in the **social networking** sector. Here users spend 24 % of their daily quota of application time. The employed business model is rather spread within social networking sector though the “Free in-app” is the most common one. We found that the frequency of “Paid” applications were quite high in this sector with a range from 24%-47%.

The **entertainment** applications sector captures 8% of the iOS and Android user's time. Here the two business models "Paid" and "Free In-app purchase" are close to be equivalence. Though we found Japan to deviate, having "Paid" applications make up 69 % of the most grossing applications while only 20 % of them were "Free In-app".

For the **utilities** sector 8 % of the iOS and Android user's time are spent in these applications. For this category it was not possible to extract data from Google Play why it is not included in the study. Nevertheless the data for iOS showed the "Paid" business model to be most frequently used and for the countries involved in the study the usage was ranging from 62-75 %. Though notable is that the "Free" applications represent 16% for USA and UK but 0% for Japan, Sweden and India. Further the data from Japan, Sweden and India showed the "Paid in-app" business model to be more common than the "Free" model ranging from 9-17 %.

The **news** sector represents 2% of the time iOS and Android users spend in applications. In this sector the "Paid" and "Free In-app" are the two most commonly used business models. The productivity sector also covers 2% of the iOS and Android user's time. Here the "Paid" business model is the most common model in all countries except from India where the "Paid in-app" model is most common.

Finally we summarized the category overall to be able to examine the material independent of sector affiliation. We conclude "Free in-app" to be the most common business model among the top 100 most grossing applications in all countries covered in the study. Nevertheless some differences were apparent in the study. We could see that the business model "Free in-app" was most common in gaming, social networking and entertainment applications. This with an exception for the notice of the social networking sector having quit a large share of "Paid" applications. Within utilities, news and productivity applications indicated to make the highest revenues when using the business models "Paid" or "Free in-app".

We consider this distribution of business models between sectors to have a connection to the measures presented earlier. For instance, if the session time is long it is more effective to use the "Free in-app" revenue model since advertising can be incorporated and exposed. If the frequency of use is low it is more suitable to have a paid than if expecting frequent use due to less occasions possible to exposure advertising. We therefore found the high share of "Paid" application within social networking and news rather surprising considering these applications

would be quite suitable for the “Free” business model. News and social networking applications are used daily or even multiple times every day. Thus, the “Free” revenue model, which often contains advertisement, would be suitable. Also if having additional layers within the applications intended to enrich the experience, it is favorable to use the “Free in-app” business model. When considering the lifetime of the application we find applications used for a longer period of time to benefit from a “Free” revenue model while applications only used a shorter time may benefit from being “Paid”. The last measure, possibility of reach, is suitable for “Free” revenue models due to the network effects that occur when having many users.

Based on these findings we find legitimate reasons for evaluating the business model carefully when designing applications.