How manufacturers profit from free-to-use software and the impact on consumers

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August 2014

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Dissertation submitted as part of the requirements for the award of the degree of MSc in Information Technology (Business)
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Abstract

The rationale behind this research question is to look at the different approaches that free-to-use software companies use to make profit. The study will aim to analyze the logic behind four widely used business approaches and also to connect them to current practices, to find out relevant and interesting real-world information. Additionally a customer research will be conducted using questionnaires to provide insights into how users perceive the different approaches used by the companies and how they react to those business methodologies. The gathered data will be analyzed to help better our understanding of how effective and persuasive are those four business methodologies. In the end the dissertation will aim to provide factual and analyzed information for both users and manufacturers.
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Chapter 1: Requirement Analysis

1.1 Objectives

- Identify, analyze and describe four widely used business models used by free-to-use software manufacturers to make profits
- Give relevant examples for each approach to illustrate and connect those business models with real-world applications and current practices
- Formulate a methodology to analyze the opinion of the mass public in consideration to the approaches
- Create a survey to find out how consumers perceive each of the four business approaches
- Analyze the collected information
- Report findings to provide insight for the benefit of both consumers and companies

1.2 Dissertation Aims

The aim of this dissertation is to provide understanding and clarity about some of the business models used by companies that create free-to-use software products. The paper will specifically focus on providing full understanding on how exactly free-to-use business concepts manage to bring forward profits. Consideration would be given to technological, psychological and economical factors, for a complete and full picture on the topic at hand. Additionally the dissertation would aim to research on how individual users perceive the business schemes used throughout the different approaches. The data gathered would then provide valuable and relevant information for both end users and software manufacturers.
1.3 Risk assessment

The nature of this research creates virtually no data protection issues or risks for the individuals participating in the survey. However the main risk would be connected with the extensive amount of work that has to be invested in the paper, as the work requires a complex analysis of the four business models selected. Another relevant risk is connected with the limitation of the literature; the reasoning for this is based on the initial research that has shown that very little examination has been done in study of the consumer perception regarding free-to-use software and this will increase the risk that is normally associated with new research. Few other risks could also be accounted, however they would not have a real impact on the work process.

1.4 Requirements analysis

The resources required for this dissertation are the literature and the research data. In more details, the literature needs to be specifically focused on the “free-to-use” business models and the reasoning for their efficiency. The research data is also invaluable as it provides the novelty, as it makes this dissertation different from other existing publications and as it answers to the existing gap in the literature that is established at the end of the literature review. For an efficient analysis of the data, it would be required access to a computer lab equipped with relevant software and the library facilities.
Chapter 2: Literature Review

2.1 Introduction

“A thorough analytical review of the literature of a given field, indicating that the student has complete, up-to-date knowledge of the field and has been able to comment on, discuss, compare, contrast and criticise what has been published in the area over a defined number of years” (Brown, 2006).

The following chapter reviews the literature concerning free-to-use software by analyzing more specifically four different approaches used by software manufacturers to make profit from free-to-use products and the paper will also observe the position taken by the general public in consideration to free-to-use profitability models. The review will identify the business logic behind four free-to-use business models and will aim to acknowledge the factors that affect their profitability. An exploration of technological, psychological and business elements will be created, as the literature review develops.

2.2 The Internet Market

According to a publication by the Copenhagen Institute for Future Studies, nowadays the individuals are "witnessing a pronounced flourishing of free content and services on the internet" (Mogensen, et al., 2009). The report argues that, this implies that all digital products would eventually become free, while the experience or the service would formulate the cost. Combining this with the fact that the Internet is creating new market possibilities and it is pushing the prices downwards (Anderson, 2008), leads to the logical idea that people nowadays have new opportunities for making money, in the face of free-to-use products (Bekkelund, 2011).
2.3 Free-to-use Software

Free-to-use is actually a term that combines both open-source\(^1\) software and proprietary\(^2\) software that has no cost for usage, meaning that the term free-to-use covers a large field of the products existing on the market. In fact on the highly complex and competitive market of software products, there is a rising trend in the use of the free-to-use software (DATA Monitor, 2012). However it is normal to ask ourselves, how companies make profits with this type of software products. In fact, there are a number of fascinating approaches that use psychology and marketing models to affect the consumer’s behavior and drive sales.

The large number of methodologies and the unclear borders between them make it nearly impossible to do a complete analysis of all the existing approaches, thus the literature review will focus on four approaches that are widely used and have a prevailing presence in the software industry, in specific:

- Micro-transactions
- Freemium
- Services
- Advertisements

2.4 Micro-transactions

Currently one of the most popular approaches for making profits through the use of free-to-use software is with the so called micro-transactions business model. Micro-transactions are actually small payments for some form of service or benefit; although this doesn't appear that innovative, there is a noticeable trend in the rise of software products that use this approach (Pierce, 2012, p. 27).

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\(^1\) Open-source is software, which has the source code available to the general public. Under licensing regulation, open-source is universally accessible, it also allows the public to change it and redistribute it (Laurent, 2008).

\(^2\) Proprietary is licensed software, which gives the rights of use under some conditions. Contrary to open-source, this type of software restricts users from modifications, sharing and redistributing the product (Donovan, 1994).
Actually this market approach is the corner stone of the free-to-play\textsuperscript{3} business model that powers some of the most popular software products in the World (Jenkins, 2014; Pierce, 2012). However the reason for the success of this approach is connected with the human psychology and marketing of products. Precisely those connections explains why smart people, spend money on free-to-use software products or free-to-play games.

Logically small purchases are the core of the \textbf{micro-transactions} business model, nevertheless resisting the urges to do such purchases takes self control. The literature has identified that, while being a renewable, self control turns out to be finite resource, meaning that over-time the individuals self control runs out. In fact a very interesting publication in the Journal of Consumers Psychology, demonstrates exactly this with the help of functional magnetic resonance imaging (fMRI) of the human brain (Hedgcock, et al., 2012). The fMRI is a common technique used in neuron research, which shows the changes in flow of blood around the organ. The paper establishes that the part of the brain that recognizes that a situation requires self control, also known as \textit{Anterior Cingulate Cortex}, has no trouble repeatedly flagging off problematic situations. However the research shows that a different part of the brain, known as \textit{Dorsolateral Prefrontal Cortex}, which is the part that actually manages self control, can only maintain its activities for a set period of time. Essentially the massage, to overcome the impulse of doing something unwise, diminishes over time. Actually the researchers could basically see the test subjects self control draining away. Some additional literatures sources also support this concept of draining away the self control of individuals (Hagger, et al.,

\textsuperscript{3} Free-to-play is a definition that connects all software game products that give portions of their content for free.
2010; Hofmann, et al., 2007). Logically this provides a clear understanding of why software products, which often offer some sort of small benefit, manage to eventually persuade consumer to actually purchase those benefits. This is known as *Ego Depletion*, and it is the affect that predisposes individuals to making impulse purchases. This effect of *Ego Depletion* is also supported by other researches; such as a research carried out by the American Psychological Association (2009), which provides evidence for the marketing power of this effect. The study made individuals to ignore words appearing on a screen, afterwards the individuals were tempted into spending money on gift shop type items, and actually the test group spent more money and also reported to be more tempted, than the control group. This shows a really good example why the micro-transaction methodology is so successful, as it guides individuals towards impulse purchases.

The idea of *Ego Deletion* is only one of the factors that actually make micro-transactions so effective, however there is much more consumer psychology behind this methodology of making profit with free-to-use software.

Another big factor affecting the marketing of micro-transactions, is known as *Reciprocity* - this is the idea that if one individual does something nice for another, the second one will feel compelled to do something nice in return. In the literature, *Reciprocity* could be acknowledged as a major component for the success of the micro-transaction business model. A research carried out in Cornell University, actually provides very interesting inside on this idea (Regan, 1971). Within this research the test group was asked to participate in a sham test, however as the group was passing their time in a waiting area, without their knowledge they were accompanied by a researcher posing as another test subject. At a given moment the researcher would leave the room and come back with bottles of Coca-cola, explaining that the study leader allowed him to have one, so he took for the other individuals as well. Subsequently at the end of the day, the insider would then attempt to persuade the test participants in buying lottery tickets. Unsurprisingly the group that received the free Cola became far more likely to spend their money on the raffle tickets, compare to the control group that was not given any Cola. Actually the test group spent far more money on the tickets than the actual value of the drink,
however the surprising fact is that once the individuals were asked to rate how much they liked the gift giver, their rating had no impact on how much money they spend. This indicates that the pressure to reciprocate was the driver behind their actions. Naturally a software product is something completely different from another human being; however it is not that hard to connect the dots and imaging that the same pressure could apply, especially when an individual spends hours upon hours using a product.

Another factor for consideration is connected with the idea of *Conspicuous Consumption*; this is the act of buying things, even rare or expensive things, that are not necessary for your life, however are bought so that other people will notice that you made that purchase. This idea was first suggested by the economist and sociologist Thorstein Veblen, to describe the new social class that emerged from the second industrial revolution in the USA (Veblen, 1899). This is highly used psychological idea and it could be used to explain why people buy expensive cars, branded products or visit expensive places. This is also used in free-to-play software, as people see your character, meaning that individuals will notice if you posses something rare or exclusive. This also has the potential to drive more sales, as people feel jealous. It is not hard to see, how this idea is used by software manufacturers across the globe, as it has the ability to drive more sales for businesses.

Majority of the software products that use **micro-transactions**, also use some sort of intermediary currency for the purchases (Shokrizade, 2013). A research has shown that putting even one intermediate currency makes it difficult for individuals to assess the real value of the unfamiliar currency (Shokrizade, 2013). This could be connected with the *Mere Exposure Effect*, this is the psychological idea that things that are familiar to us have higher
value, simply because of our exposure to them in the past (Kennon, 2012). This means that people value their real life currency higher than any intermediate currency. Logically this effect could be observed on a number of occasions, even outside of the world of micro-transactions, as this is one of the reasons people tend to spend more in foreign countries. Following this idea, one can find more evidence to understand why people spend additional resources on micro-transactions.

A good example for a product that uses micro-transactions is the currently most popular game in the world "League of Legends" and also arguably the biggest free-to-play software product in the world (Gaudiosi, 2013). It is easy to connect all the different psychological and business ideas concerning micro-transactions, with the product created by Riot Games (Blum & Fisher, 2014, pp. 1-2). League of Legends have that intermediary currency; it is closely connected with the idea of Conspicuous Consumption and it continues improvements stimulate the Reciprocity effect, however although this example and many other games profit from micropayments, not only games can adopt and profit for this business model.

Summarizing the points concerning micro-transactions, it is clear that the success of this business approach is deeply connected with effective marketing and use of consumer's psychology. The big positive is that a business model based on micro-transactions has the ability to create new business opportunities and give a lot of freedom for further development. And this could be seen in the market movements, as more and more powerful companies as adopting this model of work (Gaudiosi, 2013).

2.5 Freemium

Micro-transactions are a popular model for free-to-use software manufacturers to make money, however they are not the only one. In fact, according to New York Times a concept known as Freemium is the most used business model for companies producing free-to-use software (Miller, 2009). The idea and the meaning of the term Freemium, comes from the combination of "free" and "premium", the actual concept became popularized by Wilson (2006) as:
"Give your service away for free, possibly ad supported but maybe not, acquire a lot of customers very efficiently through word of mouth, referral networks, organic search marketing, etc, then offer premium priced value added services or an enhanced version of your service to your customer base."

Simply said, this is the idea of a company offering their software product for free, with no requirements or purchase agreements, in order to reach new audience and enlarge the existing market. Additionally the company would have a premium version of the software, which will have more options, better capabilities and better services. The tactic is to use the free version to induce users to buy premium product or content.

For a complete understanding of the **Freemium** concept, it is also important to notice that this business model is concerned with decreasing costs and dividing the product into sections (Anderson, 2009). According to Rekhi (2010), choosing where to divide the free and the paid services is the critical question for this business model. This is understandable, as companies can get one purchase in between every 50 or 100 free downloads (Pierce, 2012, p. 27), meaning that creating the "right mix of features" is the essence behind **Freemium** (Chen, 2009). This is supported by Hudson (2009), who stated that "it is very difficult to properly segment users and features such that you provide enough value to both paid and free audiences". Combining all those pieces of the literature leads to the idea that **Freemium** can be an effective business model provided that it's considerably difficult implementation is done correctly (Darlin, 2009).

Additionally similar to the other business models being analyzed in this literature review, there are a number of different factors associated with the success of **Freemium**; however it is important to distinguish between **Freemium** and **micro-transactions**. The model connected with **micro-transaction** provides a full product, with the opportunity for consumers to purchase small benefits that enhance their experience. Contrary to this, the **Freemium** business model offers products with
limited capabilities, unless the consumers pay for the premium version (Osterwalder & Pigneur, 2010).

From the information given so far, one should be able to understand and distinguish the Freemium business model; however what makes it so successful?

Firstly, this business model is closely connected with the idea of the perceived cost effect. Perceived cost is the value of a product or a service in the mind of the buyers (Kanaga, 2013). According to publication in the Journal of Marketing Science (Shampanier, et al., 2007), consumers perceive free products to provide higher benefits, meaning that people will overreact to free goods. Logically this signifies that the zero price of the Freemium software increases the perceived value considerably. Driving on this effect could be used to explain why consumers feel, pre attracted to zero-cost products (Iyengar & Leppe, 2000) and why there are large numbers of individuals that use them. Additionally according to Haruvy and Prasad (2001) in order to have a successful Freemium business model, the quality of the free software version must be low enough to push sales yet high enough to induce customers. The work of Haruvy and Prasad (2001) is mentioned intentionally, as it leads to the second element connecting this business approach with the concept of perceived cost. The perceived cost effect also affects already existing users. The reason for this is connected with the fact that people dislike substitutes and approve the products they already posses, meaning that users will value the Freemium product they are familiar with more highly, than the competitive software, even if this could possibly push them towards buying the premium version (Gourville, 2006, p. 103). It is understandable that perceived cost is an important factor for the success of this business model, as it influences the consumer's behavior and drives sales.

Another factor that drives the competitive advantage of the Freemium business model is the concept of giving something away in order to entice customers. This is by no means a new or innovative strategy; however it is a strategy that works effectively (Anderson, 2008; Time Magazine, 1927; Picker, 2010). Actually the idea of giving the product for free not only affects the perceived value, but also increases the marketing possibilities. The act of giving away the product increases the actual
credibility, the trust and most importantly it allows the product to reach a wider audience. Additionally Derek Halpern (2013), creator of one of the biggest marketing/psychological blogs on the Internet, said that this marketing strategy increases the satisfaction. The reason given is that once a user spends money on something, they tend to doubt themselves and their ability to use the products, thus leading to the idea that goods that are given away freely win more clients.

According to a publication by the expert on social media Eric Harr (2012), we live in the midst of a "Thank you economy", thus clearly suggesting that the effect of Reciprocity can be used in various business models. In fact it is not difficult to see how exactly efficient Freemium companies could exercise pressure over consumers. Actually the concept could be connected with the practice of many Freemium companies, due to the simple fact that high customer satisfaction increases sales volumes. Considering those facts, it could be understandable why Freemium companies such as AVG, continue to grow their market share⁴.

According to Murphy (2010, p. 6) "the majority of users likely have no intention of ever becoming a customer", but as their product engagement grows, the companies also monetize for their user data, thus creating another profitability model, one that could bring revenue without the purchases, a model known as user base capitalization. A user base is essentially the data collected from the users that use the product or service. In general such databases contain a lot of valuable information about the individual users. In fact according to Pierce (2012, p. 29), such databases are worth thousands, in some cases even millions or billions of dollars. This is understandable, as the information gathered provides an invaluable business tool, after all knowledge is power. In reality this approach, could explain the success of many Freemium based businesses, as the selling/buying of user's databases is happening more often than one would think (Pierce, 2012, p. 29).

Summarizing, the Freemium business model, focuses on exploiting the consumer psychology and capitalizing from the user data. The ideas of marketing the product as free, allowed the creation and the development of new business methodologies

⁴ AVG antivirus vendor market share grew from 6,2% in 2012 to 8,3% in 2013, according to Opswat market share report (OPSWAT, Inc., 2012)
that transformed **Freemium** in one of the mostly used models for free-to-use software product to make profits.

2.6 Services

As established the concept of free-to-use includes both proprietor and open-source software. The idea of a business model connected with services is mainly adopted by open-source manufacturers (Perr, et al., 2010, pp. 441-444). To understand why services are a one of the most popular business models for open-source, it is firstly important to establish what exactly open source (OS) is.

Open-source software is the concept of providing a software product with open code (Popp, 2011, p. 59), which allows all users to freely use, copy, modify and reproduce the source code. The idea was actually pulled into the marketplace, because of the demand for reduced development costs, enhanced product margins and technical superiority (Perr, et al., 2010, p. 435). It is normal to question - how exactly do companies make profit from product that is distributed for free and that could be easily used by competitors (Chesbrough, 2003, p. 2; Chesbrough & Appleyard, 2007, p. 59)? Actually many diverse forms of different business models exist, some connected with subscription fees, dual licensing or selling additional devices; however the most popular model is concerned with selling of services and product support.

In fact selling services was one of the earliest open-source business models. It covers a number of different activities, from training and consulting to customization and system integration. This suggests the idea that some form of a niche market will be required for service providers to succeed. Connecting the previous point with the comments of Matt Tucker, Co-founder and VP of Engineering at Jive Software, when he talks about the misconceptions regarding open-source (Perr, et al., 2010, p. 439), establishes the idea that open-source allows specific customer targeting. The reason is connected with the fact that companies using the open-source products for example, would require some training and some form of system integration. In fact the concept of open-source allowing specifically targeted services had lead to the success of major companies such as MySQL, JBoss and Red Hat. The success created through the use of such targeted services could be clearly seen in IBM, as
the company managed to exceed the profits from the hardware sales with the revenue from OS-based services (Lohr, 2005).

Informational technology support services provided by open-source manufacturers are an important element of the services business model. In general the open source model provides programmers with freedom and some technical superiority compared to the private software, nonetheless this also creates the need for technical and system support. To develop this idea even further, it is good to look into the publication by Gachev (2004), who establishes the idea that open-source is mainly used by people that do programming in their free time\(^5\) and also by companies. Both types of users noted by Gachev have some established needs connected with the software product that they are using, thus creating a number of market possibilities for selling supportive functions or some other services.

Additionally by providing and trading with services, companies develop the product further, thus creating another benefit for companies, in the form of heightened product acceptance, customer satisfaction and involvement. This idea could be seen in the words of Tyson Green, lead investment designer for Bungie Software, who said that evolving software products creates "these amazing communities" and more customer involvement (McInnis, 2014).

Another element of great importance about services is to understand that they are not only used by open-source companies, but also by many commercial software providers. Proprietary software could also market a large number of services, such as client support, add-ons, training, consulting, patronage, hosting and system compatibility; however it should be said that commercial software from highly popular companies make profits, as smaller manufacturers can easily understand that it would be impossible to remain competitive by just trading with services, as the benefits are easily outweighed by the long-term expenses.

\(^5\) Gachev (2004) refers to them, as individuals that do programming as a hobby.
2.7 Advertisement

A publication in the International Journal of Technology Management (Perr, et al., 2010, p. 432) indicated that software companies in general pursue more than one business model at a time. Actually an approach that is well fitting in combination with other marker strategies is advertising. Advertising is the general concept of creating a paid form of non-personal communication of ideas, which aims to create awareness, interest and/or desire (Fahy & Jobber, 2012, p. 225). The reason why advertising activities fit well with other business models is due to their capability to increase the market penetration, to support the strategic objectives and to influence customers (Jobber & Ellis-Chadwick, 2012).

Actually the ability to affect the market penetration is one of the factors that make the advertising a popular business approach. The idea is connected with the Exposure effect, which represents the amount of funds invested into the market, that the general public recognizes (Baker, 1999). Exposure increases product recognition by providing individuals with insight knowledge about the goods and the services, thus allowing better market penetration and also creating a competitive advantage. Although market penetration is a powerful marketing tool it plays a supportive role on the software market, nonetheless this supportive function has the ability to generate additional sales for other business methodologies. Companies profiting from micro-transaction for example, could easily generate additional revenue by combining the Ego Depletion effect with the exposure from adverts, as each advert would slowing push users towards impulsive purchases. Companies using Freemium could also benefit from the non-personal communication of ideas, going back to the example with AVG Antivirus; the company uses adverts to give insight on the benefits from the premium version or uses the adverts to promote other software products by the company. Those examples should provide understanding why advertising as a business model is so effective in combination with other business models.

The Ego depletion effect is important factor for the efficiency of advertising; however it is not the only one. Other important aspects for the success of adverts are concerning the Elaboration Likelihood Model (ELM) and a design that aims to appeal to specific feelings and senses of the users (Benjamin & Baker, 2003, p. 121).
The ELM is a fascinating psychological theory, which identifies two different ways in which communication could be persuasive - a central route and a peripheral route (Petty & Cacioppo, 1986). The route taken in general depends on the capabilities and the involvement of the receiver. The central route is a direct line of persuasion that requires logical thinking and high process of involvement. Simply said, this means that people with some form of a need would be more interested at ideas that could satisfy the given need; for example, if a person wants to buy a computer he would be more involved with commercials about computers/laptops. Contrary to the direct path, within the peripheral route the individuals are not specifically involved with the communication and are persuaded by different cues. Through the use of the artificial cues, the message transferred becomes less important. This is the reasoning why many adverts have loud music, bright colors or show attractive images.

Commercials focus on emotions of the users. Unsurprisingly feelings and senses have huge impact on how people are persuaded and how they decide to spend their money, which is the ultimate goal of advertisement. Logically every advert causes some sort of emotional response, however with the use of the affect heuristics concept, psychologists have established that the different emotional responses affect the decision making process of individuals (Finucane, et al., 2000). This means that if commercial causes negative feelings within the individual, then the person is less likely to find the benefits of the idea; conversely if there is a positive response, than a person would be more affected by an advert. This is the reason why adverts generally have positively charged elements.

The amalgamation of the positive elements and the beneficial emotional response, create a persuasive idea that works through both the central and the peripheral routes of the ELM, creating a much more effective communication of ideas. This shows how advertisements use psychology to create very effective drivers for sales.

Explaining the psychology behind advertisement provides evidence to understand why this business model is so effective in combination with others and why more of the literature reviewed by this study gives advertisement a supportive function.
However free-to-use software that uses a business approach based on commercials could also create profits on its own; this is achieved by promoting adverts of other companies within your software. The business logic behind this concept is simple and straightforward, yet it has proven to be quite effective. In fact many applications and majority of the websites provide evidence for the efficiency mentioned. The general idea of selling ad space is driven by a set of pricing and economical facts. Things like the size of the advert, the positioning and the design formulate the pricing that creates profits (Owens, 2011). Important notice must be given here to the fact that more popular software products profit more from ad selling, providing evidence that the market is quickly shifting towards pay-per-click contracts. This simply means that products with larger audience would have higher profitability margins from selling advertisement space.

2.8 Customer opinion

The literature analysis up to this point has identified and discussed the reasons why the four business models are successfully generating profits for free-to-use software manufacturers. However it is valuable to understand how the general public perceives those approaches.

Unfortunately there is a very limited amount of literature concerning how individual users see the different methodologies used by free-to-use software manufacturers. From the limited existing literature, one could say that there is some form of uncertainty within users about software products; this is due to the fact that technology-based products have the peculiar property to render consumers unable to assess their value (Zhu & Chang, 2014, p. 328). This uncertainty reduces the willingness of users to use specific services (Cheng & Liu, 2012). Opposing this is the concept of the free products, which is aimed to promote this type of software products and remove the uneasiness of users (Anderson, 2009).

The only other existing literature concern on the topic, establishes a position that the social contacts and the social group, affect how individual users accept and use software products (Zhu & Chang, 2014, p. 330).
Although the literature gives rise to some interesting research questions, this paper would aim to fill the gap that exist in the literature concerning how people accept the business strategies used by free-to-use software manufacturers. The growing popularity of free-to-use software establishes the need for research on this specific topic.

With the data gathered this dissertation would make observations and recommendations. In fact the information that would be provided by this research would be valuable to both companies and individual users, as it would present the concepts and how they affect individuals. The contribution would be based around providing understanding of the free-to-use software market, where the competition to win customers is fierce, by helping to identify, comprehend and predict the customers behavior and perceptions.
Chapter 3: Methodology and Procedure

3.1 Introduction

“Having identified a research issue or question one must select a research strategy and appropriate methodology for collecting information that will illuminate the problem” (Baker & Foy, 2008).

The chapter outlines the process of collecting and evaluating the information provided by the individuals. The topic of this research allows a lot of freedom in finding suitable research targets for collection of primary data, as nearly everyone nowadays is using some form of free-to-use software. Although the targeted audience is the general population, it is important to notice that there are some limitations to collection of data.

3.2 Research

This dissertation would use quantitative and qualitative data analysis. Quantitative data could be defined as data in numerical form, which can be put into categories or it can be measured (Given, 2008) and analyzed through numerical comparisons and statistical inferences. Qualitative research is “a research method for the subjective interpretation of the content of text data through the systematic classification process of coding and identifying themes or patterns” (Hsieh & Shannon, 2005). Both of those definitions illustrates that the used approach goes beyond merely counting words or answers; in fact this form of analysis examines, collects, groups and evaluates the information collected, in order to create realistic data analysis. The combination of methodologies also allows the research the capabilities to evaluate the statistical error factor, a benefit which a simple open-ended qualitative questionnaire does not provide. In addition the combination of research methodologies provides the writer with sufficient understanding on the topic, thus creating a better position towards the data and its sources.
Following on this idea, the study will consider the actual methods of collecting the data.

### 3.3 Target Sample and Methodology

In general quantitative analysis is a model that requires a large number of user data to provide efficient results. In contrast the qualitative analysis requires creativity, a systemic approach and knowledge about the literature. Combining the two different methods created the need for a large sampling poll, which actually turned out to be a simpler process that expected, as the source of the primary data could be nearly everyone from the general public. Nonetheless the demand for large response rate established that the most appropriate tool for collecting relevant data from the user groups would be to create a set of two electronic questionnaires.

### 3.4 Why use a Questionnaire

The main reason for the use of questionnaires is connected with the benefits of the model and with the limitation of other possible tools. The most noticeable advantage was established by Sanders, et al. (2007), saying that electronic questionnaires have higher response rates. Additionally this method for data collecting allows the ability to survey across geographical boundaries, as this allows targeting a larger sample poll.

The other existing methodologies for data collection are unacceptable for this research, as they have a lot of drawbacks. Using interviews or focus groups for example, would be inappropriate as the research would be very time consuming and would not allow the collection of a large amount of information. In addition those methods for data collection are more suited for providing only qualitative data, thus providing evidence why questionnaire is the most appropriate approach.

### 3.5 Questionnaire design

Having defined questionnaires as the main tool for data collection, it is important to pay attention to the quality of the questions, due to the fact that there will be a clear lack of personal communication and no flexibility.

The lack of personal contact focuses the attention towards higher consideration and specifics. The questionnaire design would require a lot of attention, as the questions
have to be limited in number and in the same time précised. This means that the layout has to be well formulated and to be very clear.

The design of the first questionnaire is based around eleven questions, focused at understanding the customers and their experience with free-software products. The second questionnaire was given only to users that have purchased online content, it has seven questions and it aims to provide knowledge about the specific feeling created from the use of free software. Within both questionnaires there were questions that were grouped, to simplify the work of the users and to avoid misunderstandings, for example all the questions concerning advertising were all grouped one after the other. This structure allows better simplicity and also reduces the possibility of receiving bias results from misconceptions. In addition from the 19 questions asked, five questions provided qualitative results with a lot of valuable feedback and fourteen questions established quantitative data about the trends in the user behavior.

3.6 Limitations of the research

Within the selected methodology there are few small limitations that should be noticed. However the most important one is connected with the time for data collecting and data analysis. A quantitative research analysis requires large volumes of data, thus creating a need for an extensive process of data gathering. In addition sorting out and evaluation on the large amount of information would prove to be a time consuming process. Those factors make the research process a bit more complicated, as the work would have to be managed under a strict deadline.

Naturally there are some limitations concerning the use of questionnaires. The lack of personal communication is limiting the ability to gain clarity on the topic and to understand the positions established by the information sources. Also questionnaires are not actually flexible. It is hard to learn the reasoning behind the responses, thus creating a need for high consideration on the questions. However in consideration to the fact that the questionnaire would allow the gathering of larger amount of primary data with virtually no ethical risks, it could be established that the benefits outweigh the negatives.
3.7 Ethical Consideration

A big positive of this research is the fact that there are virtually no risks connected with the process of data gathering. First of all, to satisfy all the ethical consideration factors, the electronic questionnaires will contain a supportive agreement that users have to read and agree to, if they are to answer any of the questions. This means that all users will be informed about their action and will not be able to continue if they disagree with the supportive statement. Furthermore in addition to the fact that participation is voluntary, all the information given will be anonymous and no personal information of any kind will be collected. Another important element is the fact that all the results will be deleted once the research is completed, thus following all the ethical considerations.

3.8 Conclusion

This chapter commented on the research methodology that would be used to understand and evaluate four business approaches used by free-to-use software manufacturers. The chapter outlined the main ideas behind the research design and also recognized the gaps in it. The big factor is that targeted segment group is very large, thus providing for a large quantity of data.
Chapter 4: Results and Discussion

4.1 Introduction

The following chapter will use the gathered data to identify, examine and establish the most important factors that are apparent from the primary research data. The goal is to analyze the primary data, compare it with the existing literature on the topic and provide relevant information that the manufacturers could use to learn more about the changes in consumer behavior and the developing market trends in the world of free-to-use software.

4.2 Primary data and Sample Response

Within the previous chapter it was established that the source of primary data will be a set of two questionnaires. The first questionnaire received 103 responses, providing a large quantity of data for analysis. Additionally four other individuals agreed to answer the questions, however they established that they have no experience with free-to-use software, this made their responses void. The second questionnaire was only given to the individuals that answered positively to specific questions within the first questionnaire, the second set of data provides much more specific information about how users feel and what do they expect when purchasing freemium, buying downloadable content (DLC) or getting involved in micro-transactions.

The data gathered provides a large variety of information, due to the fact that the primary research managed to collect responses from.

![Chart showing responses by gender](image)
both male and female users, within a number of different age groups. The results indicated that 63% of all responses were provided by males and 37% were by females. The users were also grouped into specific age groups, to provide relevant information about the trends within specific age groups and the differences in the believes of users, as this is bound to provide valuable information for companies.

The figure above visually represents the amount of responses generated by the different age groups. The fact that the responses were gathered from such a wide variety of users, only serves as a positive, because this allows the research to acquire data from users with different perspectives.

4.3 Emotional response

The first set of questions was aimed at understanding how exactly individuals feel when using free-to-use software products. In more specifics the questions asked how satisfied are users with free software and how can free software stand up to the existing paid products. Additionally by clustering the responses a much higher quality of the analysis can be created, this is supported by the work of Miles and Huberman (1994).
Figure 6 The responses to the first question in the questionnaire, about how satisfied and accepted are free-to-use software products

The figure above represents the responses from the first question. The first noticeable feature is that 53.39% (+/- 4%) of all users say that they are satisfied with the free-to-use products and their profitability models. This supports some of the most recent literature that suggests that free products are more accepted and profitable than before (Calvert, 2014). The positive reaction about free software is especially true for users between 15-20 and 25-30, as those age groups provided a big portion of the positive responses. Interestingly the users aged 20 to 25 formulated the biggest proportion of the individuals that could not decide if they are satisfied or not with the free-to-use software. This data suggests that younger generations are happier with the free software trends and are more willing to accept them; however this could be a natural response to their exposure to better quality free software products, compared to an elder generation. Another note is that ~28% of the users established that they are unsatisfied; however the surprising finding is that ~20% of the users said they are very unsatisfied. Such a high negative response is unexpected, especially when connected with the literature, literature that establishes that the free elements makes the products more engaging and more "fun" (Calvert, 2014). Contrary to the literature, the data gathered from the first question fits well with the information provided by a question that asked users to establish, if they believe that free software is on the same level as the paid counterparts.
Figure 7 Responses to the first question from the second questionnaire, asking users to establish if they believe that free-to-use software is on the same level as purchased

Evidently from the information from figure seven, 42% of the users established that free-to-use software is behind in terms of quality compare to the proprietary products. This could explain why the previous answer had such a high amount of negative responses, nonetheless the important note here is that a big portion of the users believe that free computer products are lacking in some way.

The most interesting finding is the fact another 42% of all responses agree with the idea that free-to-use is on the same level as proprietary, this is especially true for younger people who formulate a big portion of the positive responses. This is very remarkable, because of the high percentage and quantity of the participants in the questionnaire. Additionally from the data 16% established that it is somehow possible to say that free software is equal to purchased, this is understandable and expected as individual experiences will affect the decisions of users, nonetheless the number of people that in some form agree with the question only suggests that more individuals are having positive experiences with free software.

Nonetheless, although the data gathered from the second question is interesting, it is also inconclusive due to the fact that negative and positive results received the same number of responses and also due to the fact that individual experiences have high impact on the answers provided.
Summarizing the points gathered from the two questions, establishes that people between 15 and 30, are much more satisfied with free-to-use software products and applications. Users in those age groups have high positive emotional response, compared to other users, as they are more willing to accept and use free software. Contrary to this, older generations find free software lacking in terms of quality and the data from the first questions provided clear information about the fact that older people are much still refraining from adopting free products.

4.4 "Zero" cost

Analyzing the absence of cost is a very important element for understanding the rising in the number of free-to-use software products and their success. In fact, the questionnaire provides information about how influential is the "zero" cost effect.

The analysis of the data from question three within the first questionnaire, established some clear results, which could be seen in the figure bellow.

![Figure 8 Results to the questions - "Do you feel that the absence of cost has driven you towards using free software?"

The question at hand asked individuals to establish, if the absence of cost had an effect on their behavior. The results speak for themselves, as only 7.76% of all responders said that the cost had nothing to do with their decision to use free software products. Contrary to this, the majority of the users (63.13%) said that the lack of monetary risk had some impact of their decision making process. Breaking
things down even further shows that about one third of all responses established that the concept of the "free" product was a big part of their decision. The gathered responses not only prove that efficiency of the perceived cost effect, noted in the Journal of Marketing Science (Shampanier, et al., 2007), but also provide evidence why experts believe the market of free-to-use software is only going to develop further.

However one question is unable to facilitate such a strong statement, for that a query from the second questionnaire would be used to further prove how important the absence of cost is for the software users at present time.

<table>
<thead>
<tr>
<th>Could you provide at least one thing that you like in general, in the free software products that you use?</th>
<th>Response rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Summarized Responses</td>
<td></td>
</tr>
<tr>
<td>Free products</td>
<td>41.93%</td>
</tr>
<tr>
<td>Accessible</td>
<td>16.17%</td>
</tr>
<tr>
<td>Higher usability</td>
<td>12.9%</td>
</tr>
<tr>
<td>Comfortable</td>
<td>9.67%</td>
</tr>
<tr>
<td>Large user base</td>
<td>9.67%</td>
</tr>
<tr>
<td>Competitive</td>
<td>3.22%</td>
</tr>
<tr>
<td>Other</td>
<td>6.44%</td>
</tr>
</tbody>
</table>

Figure 9 Responses from an open-ended question, aimed at understanding the things that the consumers like in free software products

Evidently from figure nine, the question at hand was collecting qualitative data to provide more relevant and honest information about what exactly users liked from their experience with free-to-use software. Approximately ~42% of the entire user poll said that they like the fact that the products are "safe for the wallet", which could only be used as a prove that the "zero" cost could be used as a powerful driving force on the market of free-to-use software products. This notice also provides evidence for the market of free software is going to grow and develop further, as there is a market possibility for companies to attract large consumer groups by marketing products as "free". Some focus should be given to the accessibility, as ~16% of the users indicated that they like the fact that free software is very accessible. This is also
connected with the fact that software is free-to-use, as this also users to adopt the specific technology easily and is also use it from a variety of locations.

Another interesting observation from the results is that some users talk about usability (approximately 12.9%) and comfort ability (approximately 9.67%), which is quite surprising as the literature rarely focuses on those elements. The concepts of marketing free-to-use products somehow neglect those elements, which could be seen as a negative. The results could suggest that better facilitating of the users could be highly effect and would also impact the Reciprocity affect, which was established in the literature review has high impact on the consumer psychology.

It should also be noted that around 10% of all users' like that free software attracts larger user groups. This is pertinent information for the free-to-play business models that are used by a number of companies, due to users apparently enjoy the possibility to interact with a higher number of individuals and creates variety and a unique experience. In this respect, it would be advisable to companies that market free-to-play software, to further research the level of interaction between users, as this could allow for a number of possibilities to market any free software.

By summarizing the information from the two questions, it becomes clear that the absence of cost is a key factor for the success of free-to-use. It is actually one of the main elements responsible for the high adoption rate and the market growth rate of this specific type of software. From all the data, it is clear that the "zero" price that drives the market of free-to-use is an unquestionably powerful driving force, however it is not the only one, as companies should not forget the importance of quality, accessibility, usability and variety. Those are some of the things that a number of users indicated to enjoy in free software besides the lack of cost.

4.5 Purchased Content

Doing an analysis on any free-to-use software will be incomplete, without looking into the concept of purchased content, be it micro-transactions, freemium, selling services or downloadable content (DLCs). Selling digital content is a corner stone for the success of a majority of the business models analyzed within this paper. Selling content is such a popular business idea, that it is widely used not only in free software, but also in a large number of proprietary computer products. To gather
more information from the users about those build-in purchases a set of four questions was created.

The first of those questions, asked how many of the users buy content and how often; this question found a place within the questionnaire naturally, as it is unrealistic to believe that all users buy content for free-to-use software. The literature from few years back, even suggests that only between 1% and 10% of all user buy online content (Wilson, 2006). However the results from the questionnaire provide contradictive information.

Evidently the results contradict the older literature, as 65.35% of all users questioned established that they have purchased content. This result is very important for the research, as it fits perfectly with the newer literature publications, which suggest that "65% of internet users have paid for online content" (Jansen, 2010). The similarity of the results, not only confirms the validity of the data gathered, but it also provides clear information about how much have the software users evolved in a couple of years. Another proves for this user evolution; can be seen in the fact that ~37% of all users have purchased build-in content on a number of occasions. Those results are very different from the literature made in the early 2000s. However this is not the only important observation, the results also show that there is a large market opportunity, which companies can pursued. This opportunity is connected with the fact that ~28%
of the users said that they have purchased content once, this creates a great possibility for market development, as those users have already been persuaded once to buy content for some reason. This logically means they are more deceptable and more vulnerable to the marketing strategies of businesses, than users that have never purchased online content. Understanding the needs and the past experiences of this specific audience group, would open a new market possibility for businesses.

A small notice should also be given to the 34% of the responses that indicate the individual users have never purchased content. Those users have neither experience nor honest opinion about online content; this is why the following three questions were only answered by users that have bought content at least once.

The next question aimed to understand how satisfied were the individuals post purchase. There is a lot of valuable data from this specific question, as it allows better understanding of the users and drawing out better conclusions about the concept of purchasing content.

![Bar Chart](image)

**Figure 11 Results from a question asking how satisfied the users were after purchasing content**

The responses shown in figure 11 were quite surprising, as the satisfaction rate is very low, actually only ~40% of all users say that they were happy with the content they have purchased. This is a surprisingly low volume of happy customers; especially then you understand that many companies believe that the users are highly motivated about the idea of buying additional content. Looking into the results
further, shows that around 31% of the users are unhappy with the products they have paid for, the next few questions would look more specifically why a third of the responses are unhappy with what they have received for their money. Also 29% of the users established that they have some neutral feeling towards their purchasing activities; this once again proves that companies are missing out on the market possibilities, as the software manufacturers have missed on the opportunity to satisfy more those customers.

The low value of positive responses to the previous question, created the need to ask users, if they were missing something specific in the content they have purchased.

![Figure 12 Results showing the opinions of users, when asked if they were missing out on something in their build-in purchases](image)

The results here continue to be very surprising, as only 29% of the users believed that the product was of adequate quality. Nonetheless the more stunning fact is that 71% of all respondents indicated that somehow there was something lacking within the products. This very high result provides information why the previous question signaled out for the existence of so many unsatisfied or indecisive consumers. This data also clearly suggests that the online content, which is constantly sold by the free-to-use software products, is failing to deliver a high quality experience to the users. The analysis of this question, once again states that companies are missing out on market opportunities, in fact Gregory Ciotti (2013) establishes that highly satisfied consumers will promote the purchases of online content, however the
majority of the other users will have detracting opinion. Combining the results from this question and the previous one, suggests that companies selling build-in content are risking with hastily developed or incomplete products, as this could create a negative marketing generated by the users themselves.

To understand the users better and to provide some guidelines to software manufacturers, the individuals were asked to write down at least one thing that they would like to see in their future content purchases.

<table>
<thead>
<tr>
<th>Summarized Responses</th>
<th>Response rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>More content</td>
<td>18.56%</td>
</tr>
<tr>
<td>Quality</td>
<td>18.56%</td>
</tr>
<tr>
<td>Innovation / New things</td>
<td>15.53%</td>
</tr>
<tr>
<td>&quot;More value for my money&quot;</td>
<td>15.53%</td>
</tr>
<tr>
<td>Usability</td>
<td>6.44%</td>
</tr>
<tr>
<td>To fulfill the promises</td>
<td>6.44%</td>
</tr>
<tr>
<td>Better work conditions</td>
<td>6.44%</td>
</tr>
<tr>
<td>Other</td>
<td>12.50%</td>
</tr>
</tbody>
</table>

Figure 13 Results from the question, asking what people would like to see whenever they purchase online content in the future

It is important to understand that individual preferences, experiences and environment are highly affecting this question, thus it is impossible with only the collected data to provide conclusive results, however the information from the responses still allows for some valuable observations to be made. The users highlighted three elements that require more attention; those are the volumes of content, the quality and the innovation. Improving those specific sections will be a great improvement for companies, as the users are becoming more demanding for the money they spend. From the data it becomes clearer that no matter which free-to-use business model is adopted by companies, the users are becoming more informed about their purchasing power to request things with higher value for their money.

Summarizing the analysis of the data about in-product purchases of online content, clearly showed that the users have evolved and have became more aware of the
technology surrounding them. Users are more open to free software and are more willing to pay for specific content, that they were five or ten years ago. The analysis also suggests that many software manufacturers are missing out on the market opportunities that are created by the user evolution. The large quantity of unhappy and indecisive customers is evidence that the market has changed and that the individuals have became more demanding. Companies have to learn to provide online purchases with better quality, with more innovation and with higher volumes of content; otherwise they risk negative publicity and possible loss of existing customers.

4.6 Past experiences from build-in purchases

Talking about in-product purchases, upgrading to freemium or buying DLCs is very important, as those are key elements for the free-to-use market. However a full analysis on the topic also requires understanding on how users are affected by their past experiences. The data on this subject could be seen on the figure bellow.

![Figure 14 Responses to the question, asking if people agree that they are affected by their past experiences with purchasing digital content](image)

A number of the results and a number of publications within the literature (Lerner & Kelter, 2000), show clear evidence that experience has psychological impact on the choices made by individuals. However the results did not provide so conclusive results, however the data provided more depth to the idea of user evolution, which was mention before. The gathered information suggests that past experiences with
purchased online content, are becoming less influential on the behavior. In fact ~34% of all the users stated that their experience the purchasing build-in content had no impact on their future decision to do so again. This is very interesting position, as logically one would think that users would avoid spending money on some form of a service they didn’t enjoy the first time. This means that number of users has reached a point where their judgment trumps the experience, as Warren Bennis and Noel Tichy wrote "With good judgment, little else matters. Without it, nothing else matters" (2007). Analyzing the primary and the secondary data, one could suggest that some users have started believing that purchasing build-in content is a good idea, regardless of their previous experience, knowledge and feelings. This then raises a number of questions about how strongly this suggestion is true and how much it is affecting the market of the free-to-use software; this is a lot of valuable information that provides good grounds for another research.

4.7 Advertising

Analyzing the market for build-in purchases is important; however there is another equally important element for the free-to-use companies. This element is the advertising, advertising is the new corner stone of the free-to-use market and it has become one of the most widely used concepts in recent years, however this marketing overload affected the users and the next few questions that would be analyzed would aim to understand more about what the consumers think and feel about the "flood" of ads.

Unfortunately it is impossible to find out how the individuals would react to adverts, due to the large quantity of psychological and external factors; however it is possible to understand how users feel about having adverts within the free software products and how is that affecting the users. In fact, the first question that would be analyzed within this section of the paper, was aimed exactly at understanding how approving are the users about the fact that there are ads within the digital products.
The results from the question show that only around 20% of all users questioned said that they have a positive attitude towards adverts. On the other hand 40% established that they disapprove of the use of this marketing approach within the free-to-use software products. Clearly the existence of higher number of disapproving response suggests that there is a lot of negativity towards software adverts, making them less appealing and much less effective. The next few questions and the data gathered through them, would aim to provide clarity and understanding for the results given to this question.

To provide this concept of clarity the second question asked the users to share what they think about the current amount of adverts within the free software products.
Clearly the data from the figure above show that over half the users (53%) believe that there are more adverts than needed. This suggests that a big portion of the users feel overloaded with ads and marketing schemes. This big quantity of negative responses also explains why on the previous question 40% of the consumers have indicated to have negative attitude towards adverts, as they are wearied down by the amount of promotional campaigns that they are exposed to.

On the other hand 26% said that the quantity of adverts is good as it is, this was especially true for users over the age of 30. In addition a portion of the users, around 21%, indicated that they would like more ads within the products, here the majority of those responses were from users over the age of 25. Having such a difference in the responses, requested further analysis, this is why the questionnaire also asked the users to share how often they are prompted with promotions or requests for purchases. This question was developed with the purpose of providing better insight to the responses given to the previous two questions.

![Figure 17 How often are users promoted with marketing schemes and promotions](image)

The data gathered is inconclusive; nonetheless it clearly displays the fact that all the users ask can be separated into three groups.

From all the responses about advertising, it could be seen that the younger consumers demonstrated the most negative position towards the ads. Exactly the
users between 15 and 25 provided most of the results saying that they are frequently prompted with different marketing promotions.

Contrary to this the individuals questioned, that were in the age groups over 30, stated that they were much more approving of adverts and they find them a lot more facilitative.

Those finding are valuable, as they provide more knowledge about the user preferences; however there are more factors to be taken into account before more specific and complete conclusions could be drawn out. This is why the users were asked to share if they have ever felt induced or persuaded by the adverts within the free software products.

![Bar chart showing responses to how persuaded users are by adverts.](image)

**Figure 18 How persuaded are users by adverts**

From the first look, one would be able to understand that ~16% of all responses indicated that the users don't pay attention to adverts; in addition nearly 35% also said that the marketing promotions have no persuasive affect on them. Those results are very negative, however they should be expected, as it is very difficult for adverts to engage the users directly and guide his decisions. Although those results appear grim, they are not the only findings from the data, actually 21% of the users established that they have frequently felt engaged with the ads within free software.
Another interesting think is also the fact that 24% of the users also said that they had at least one moment, when they were induced by a promotion in a free software product. The last two percentage figure, suggest that adverts can be effective, surprisingly this is an opinion shared by all the age groups, and proves that there is a merit in the use of different marketing schemes within the free-to-use software products.

The information from the last question provided a lot of data that would have draw out a real conclusion on the topic of advertisements, however before that one final question should be addressed. This specific question ask users to note at least one think they dislike in free software, the fact that the question was open ended allowed the research to gather a lot of qualitative data. The Data provided few very interesting perspectives about the use of advertisements in the free digital products.

<table>
<thead>
<tr>
<th>Summarized Responses</th>
<th>Response rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Requires payment</td>
<td>29.94%</td>
</tr>
<tr>
<td>Adverts</td>
<td>23.68%</td>
</tr>
<tr>
<td>Poor quality</td>
<td>10.52%</td>
</tr>
<tr>
<td>&quot;It feels unfinished&quot;</td>
<td>10.52%</td>
</tr>
<tr>
<td>Unoriginal</td>
<td>7.89%</td>
</tr>
<tr>
<td>Latency</td>
<td>7.89%</td>
</tr>
<tr>
<td>No updates</td>
<td>5.26%</td>
</tr>
<tr>
<td>Restrictive</td>
<td>4.30%</td>
</tr>
</tbody>
</table>

Evidently the biggest portion of the results indicates that users dislike when they are asked to pay within the free software products. This is understandable, as the absence of cost is one of the selling points of the free-to-use concept. This response proves that as previously established the individual users disapprove of the idea of having to pay for content, for options or for the ability to stay competitive to the other users.
The second most common answer was concerning the adverts and here some very interesting open-ended responses were received. A lot of the people said that they find most of the ads very aggressive and inconsiderate about the consumers. This is a good qualitative observation that provides more useful data to the topic. Additionally some users indicated that they deeply dislike the moments when the ads make the work harder or when they obscure the vision. In reality those a completely logical and just responses, that explain why ~24% of the users dislike adverts,

Another fascinating point was indicated within two of the comments; the responses stated that software manufacturers should learn from the advertisements used by the free software "Steam". Those comments suggested that "Steam" has the best advertisements approach, they have seen within a free software product. Companies could only learn from this type of feedback and improve their business activities for the future.

Another portion of the answers to the question, which requires some attention, is the discussion about the quality. There are a number of responses concerning the poor quality of free software and the "unfinished" state of most free digital products. This is important data, as those are very important accusations that require the attention of companies and manufacturers, if they would like to remain competitive on the market.

Overall this question provided a lot of qualitative data, which will be used now in combination with the findings from the other questions to deliver a valid conclusion and advice for businesses.

Combining the data from all the questions concerning advertisements, provided a number of different resources, however the combination allowed sorting out and making a legitimate conclusion for the use of ads within free-to-use software products. The data gathered showed that adverts can be engaging and effective for all user groups, regardless of age and gender. However it is clearly evident that companies need to use the marketing tactics in moderate amount, as the overload of adverts leads to a number of small annoyances for the users and eventually burdens the consumers. In some cases decreasing the amount of adverts is also important, as number of users felt that they are constantly prompted to purchase content, if they are to remain relative. The combination of the results could also be seen as a
possibility, as the responses indicate that there are areas for improvement, so that the users can be persuaded in a more effective matter.

4.8 Additional findings

The research has some additional data to provide on the topic of free-to-use software. The data is formulated by the results gathered to the last two questions, within the first questionnaire. The first question was aimed at understanding how much the market changes has in recent years, this is why the users were ask to tell which time of software do they use.

![Figure 20 Chart showing how many of the users indicated that they use specific form of free-software](chart)

Clearly **Freemium** is the most widely used methodology, with high percentage value of nearly 80% of the responses. The results support the literature, as this free-to-use business approach is evidently the most popular one. However the findings provide the interesting information, that with advances in age less people use the **Freemium** models. In addition young users between 15 and 20 years of age also don't indicate very high support of **freemium**.

**Micro-transactions** are the next approach; however the results indicate a big change when compared with the literature. Nearly 70% of all users have used
actively one software application that supports micro-transactions, thus clearly showing the growth that can be seen within the market of free software products. Similarly to Freemium, the concept of micro-transactions appears less popular with advances in age, however the decline in the responses indicated within the responses in much more severe in the micro-transactions sections. This means that a lot of the elder users do not adopt products with micro-transactions or do not feel persuaded by them.

Surprisingly 36% of all users said to have experience with at least one type of software product, where the manufactures sale services as a supportive function. This is a very high value, considering the fact that such free software is used by businesses or more experienced users. Another observation on the topic is the fact that users between 25 and 35 are the individuals with the highest response rate concerned with the services concept. The younger users however have hardly every used this type of free software, thus showing one limitation of the trade of services for software products.

Advertisements is the final approach to be analyzed, the responses concerning it are quite expected as over half of the users established that they have experience with software that uses adverts. However much more interesting is the fact, that unlike the other methodologies, advertisement doesn’t show fluctuations in the responses between the different age groups. In addition the results are higher than previous market researches on the topic of free software, showing the growth in the use of ads in software products. Those observations prove the efficiency of ads and the ability to implement adverts within a wide variety of free software products.

In conclusion to the question about the market changes, it could be said that the market of free software product has continued to evolve, as evidently there are growing developments in the different business methodologies. While freemium continues to be the most widely adopted approach, new market strategies show growing popularity. Combining this with all the information gathered so far, it becomes clearer that users are more accepting of the free-to-use concept, thus allowing grounds for further development. The results from the question at hand also provided information that users over 30 year are still to embrace the concept of free-
to-use, thus establishing another business possibility as older users have the capabilities to do extensive purchases and bring in profits for the manufacturers.

The last question from the questionnaires was opening ended and had the sole purpose of provide qualitative information about what is missing in the free software products. This question allowed the research to gather more data from things such as personal preferences, past experience and the influence of peers.

<table>
<thead>
<tr>
<th>Summarized Responses</th>
<th>Response rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>“Nothing” / “Can’t say”</td>
<td>33.78%</td>
</tr>
<tr>
<td>“Creativity” / “Innovation”</td>
<td>28.37%</td>
</tr>
<tr>
<td>“Quality control”</td>
<td>12.5%</td>
</tr>
<tr>
<td>“Marketing”</td>
<td>6.45%</td>
</tr>
<tr>
<td>“Promotional adverts”</td>
<td>6.45%</td>
</tr>
<tr>
<td>“More content”</td>
<td>4.16%</td>
</tr>
<tr>
<td>“Accessibility”</td>
<td>2.77%</td>
</tr>
<tr>
<td>“They need to be more interesting!!!”</td>
<td>1.38%</td>
</tr>
<tr>
<td>Other</td>
<td>4.14%</td>
</tr>
</tbody>
</table>

Figure 21 A representation of all summarized responses given to the question at hand

A very important note for this specific question is that 30 users didn’t give any answer and skipped it completely. Sadly the reduce number of responses makes the data more vulnerable to statistical errors, thus providing inconclusive results. Nonetheless there are few noteworthy responses, which acquired a high percentage of the responses, providing realistic information about the question asked. Additionally it must be noted that this was an open question, suggesting that a number of statistical calculation error become obsolete.

The most common responses were from users that couldn’t come up with an answer to the question, thus collecting results such as “I got nothing to say!” was often seen. This is reasonable, as the question was not easy to answer. The negative replies were to be expected, however much more interesting is the fact that 28% of the users said that “Innovation” is needed for the success of a free software product. The high
number of users that described that innovation is needed suggests that users are often faced with recycled products that lack creativity. One of the best way to support the last suggestion is to quote one of the users, who said “Businesses need to spot selling the same **** in new packages and need to show me something new, before I go back to buy from the computer programs”. The quotation is live proof of the fact, that the consumers are becoming more and more knowledgeable about the software products.

Quality is another factor that the individual focused on, in fact 12.5% of the open answers said that improvements in the quality is needed, if free software is to become competitive. A number of the responses all over the two questionnaires indicated that users have experienced coding errors and poor quality of the work. The combination of previous responses and the responses to this question, prove that there is validity in this specific result. This also means that software manufacturers have to focus further on the quality, as those negative comments could easily transform into bad publicity.

The low volume of the other responses makes them invalid, as they can be completely accounted for by the different statistical errors. Regretfully this leads to a position where some interesting responses have to be ignored, as they can be accounted for statistical miscalculations.

From the information gathered by this specific question, one can draw out a conclusion that the users themselves believe that free software products require more innovation and better quality control. Those suggest that companies that could improve on those factors can more easily attract the users and gain market recognition; however it should be noted that this is based on the responses of the users themselves.
Chapter 5: Conclusion

5.1 Introduction

The original goals of this paper were to identify, describe and analyze the business methodologies used by the different free-to-use software manufacturers. The knowledge gathered would then be used to create a survey that will allow better understanding of the new consumer trends. The objective behind this survey was to provide valuable information that companies could use to improve their businesses and their products.

As the dissertation developed, it went through an indebt analysis of the literature explain the success of the different business concepts and to add value to the psychological, and business ideas that make the free software profitable. Additionally in the development of this research two questionnaires were developed to provide better awareness of the most current tendencies in the consumer behavior. Within this specific chapter of the paper all the knowledge and data accumulated up to this point, will be used to draw out valuable conclusions for businesses and to offer recommendations for future studies.

5.2 Research Conclusions

The most evident conclusion that can be made from the data gathered is the fact that the individuals software users have evolved. In fact in a period of merely five years the software users have become much more aware of their buyers power and the changes in the technology. The clients are now a lot more open to free software and to the idea of online purchasing. In addition the research data showed that users are less affected by their past experiences with purchasing online content, and this is especially true for the younger users.

The evolution of the users also provided a lot of other valuable data. One of the noticeable conclusions is connected with the fact that numerous businesses are
missing out on the market opportunities. On a number of occasions throughout the questionnaires, the users indicated that quality, innovation and usability are widely neglected within the existing products. Actually a question that asked the users what would they like to see in the next free software product, large quantities of the responded in this exact fashion. Of course factors like the "zero" cost and the accessibility, are important elements for the software, and even the data gathered provides clear evidence for this; however those are not the only selling points, as companies need to fulfill the user requirements, if they are to trigger the psychological factors that drive the purchasing processes.

Mentioning purchases leads to the next conclusion, which is concerning the process of doing purchases within the free-to-use software products. This is important notice, as it is connecting to the core of a number of the free-to-use business models. The finding actually prove that the individuals users are much more approving of the processes of paying for online content, as consumers have started finding this processes for natural. This also suggests that users are more likely to engage in the purchasing activities, this is further supported by the data that shown that over 65% of the users have become involved in buying/unlocking online content. The findings clearly show the existing market possibilities and also provide explanation for the reasons why one can easily see a growth in the number of micro-transaction businesses.

Advertisements are another topic that requires great consideration, as adverts are a widely adopted marketing practice within the industry of free software products. With a combination between all of the primary data and the existing literature, it is easier to establish more clearly a realistic conclusion. A conclusion that would recommend businesses to use lesser numbers of adverts, that are to be more specific and more user focused, thus allowing better user involvement. Although simplistically sounding, this conclusion is based on all the information gathered and it represents the views of a large number of individuals.

Furthermore some additional information was gathered, information that can show the market progress in recent years. The feedback from the questionnaires and the latest literature, shows the astounding growth and the rapid development rate, which can be seen on the market of free software. Actually in only few years, the business
with free software products have grown to a position, where it is overtaken by a large number of competitors and where it is able to bring in high revenue numbers. The growth and the information gathered throughout this paper, leads only to the conclusion that companies need to continue developing and to continue seeking perfection, otherwise it will be impossible to remain competitive on the market.

The analysis has shown that by combining the different business approaches better market possibilities are created. This suggests that for example Freemium or Micro-transactions, which are potentially more consistent in their revenue streams, can exploit their wider customer base and use commercials and adverts to further increase their market. The key component of the four free-to-use business approaches is to gain indirect monetization from the product.

Another recommendation is that the manufacturers of free-to-use software never stuck with only one business approach and switch between the models. It is advisable that companies should change between the methodologies and explore for the best practice for each individual product, as the market success of one software product, doesn't mean the success of others. The study of the users actually provided findings that selecting the best business approach for a specific product are of paramount importance for the success. This can be seen both within the literature and within the experience of individual users, as nearly every single one of us personally knows products that have failed on the market due to poor business decisions.

As an overall conclusion of all the information analyzed, it can easily be established that the business with free software products is a business with a large number of market possibilities. The research shows that the consumers have evolved into more demanding users, which despite of their better knowledge on the topic are also more engaging in purchasing, and are only asking for products of a higher quality. The activities concerning the actual process of purchasing and advertising, have now reached a stage where they require a lot of attention, due to the fact that they may be effective, though they can have negative influence on the buyers. Nonetheless the market possibilities concerning the free-to-use software products are real, and the evidence can be seen all around us.
5.3 Recommendations for future research

The data gathered also established that the re-engineering process appears to be more efficient, thus providing a vast base for future research. A study on the re-engineering efficiency would be in fact interesting. Most of all such research would add real value behind the re-engineering ideas.

The research on the topic revealed that there are a number of market possibility concerning free-to-use software products and that there is also a growing interest in this market sector. Those findings provide a number of very interesting suggestions that could be used to create a valuable contribution to the literature on the topic.

Within this research the entire literature review, the data and the analysis were based on the four mainly used business concepts. This provides grounds for a future research based on the combination of the different business methodologies, as the combined business models are used by number of companies and create some fascinating market models. In addition indentifying the efficiency of combining the different business approaches into a blended market strategy will produce very valuable information.

A very interesting future research could be based around the idea that users of free software products are not that highly affected by their past experiences when doing online purchases. This specific research provided some evidence and some very interesting findings on this specific topic; however the data was inconclusive thus creating the need for a future research. The data that could be provided could be invaluable, as it would provide highly beneficial literature on the topic of selling product within specific software.

Another point for a future research topic is to understand the opinions that software manufacturers have developed towards free-to-use. Considering the fact that the latest publications show that software developers do not have high enthusiasm about the concept of "free" computer products (Sheridan, 2012), provides more evidence why the knowledge from this specific research could easily become highly popular and very interesting for the manufacturers and individual users.

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6 A perfect example could be given with a company called NCsoft, which is testing a very interesting business model within one of their products "WildStar".
Another idea for a future research is concerning the **Freemium** business model, evidently **Freemium** is still the most widely used approach on the market of free software, nonetheless there are tendencies showing a decline in its popularity. A future research could try to understand those tendencies and establish the reasons behind them. Therefore a research on this specific topic would be able to provide direction for businesses that are using the **Freemium** approach, thus producing valuable insight that can attract a lot of attention.


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