Aalto University
School of Business

Publishers, turnkeys, clubs and boutiques. A business model taxonomy in the context of free open source software extensions. Case WordPress.

Organization and Management

Master's thesis

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Department of Management and International Business
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Abstract

Free open source software (FOSS) is becoming a significant part of our digital infrastructure. The most popular web servers, mobile phones and websites run on FOSS platforms. The modular architecture of the software has also emerged an extension ecosystem around FOSS, complementing the functionality of the core product. Current literature has very few studies on the business models in the extension ecosystems. Therefore, this research aims to fill the gap and answer the question: What kind of business models exist in extension ecosystem of FOSS products?

The research is based on the concepts of FOSS, business ecosystems and business models. WordPress publishing platform is chosen as the case of this study because of its popularity and modular structure, which has emerged a vivid ecosystem. WordPress is also presented through perspectives of history, community, development process, outcome, and the business ecosystem.

The aim of the research is to supplement the current taxonomies on business models in the context of FOSS extensions. The business models of 64 companies offering WordPress theme extensions are mapped with the business model canvas. The evidence is analyzed through pattern matching, trying generate a taxonomy of business models in the context of FOSS extensions.

Based on the research, it can be suggested that four distinctive business models can be found in the extension ecosystem, which is a novel finding that has not been described in the literature before. These business models are named as Publishers, Turnkeys, Clubs and Boutiques.

The contributions of this study help understanding that the business models in ecosystems are more variable than previous literature describes, and that the business models form around the main actors in the ecosystem.

Keywords free open source software, business models, business ecosystems, wordpress

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The author with Henry Chesbrough (left) and Alexander Osterwalder (right).

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As this kind of a process is always demanding, not only from the author but also from the ones close to him, I want to thank a couple of people involved in the process. To Tiina, thank you for your valuable comments and help on improving the quality of this thesis. To my mother, thank you for making me careful on the details, introducing me to coding at the age of 8, and paying my hosting bills when I started my hobbies in building web sites. To my father, thank you for raising me curious, entrepreneurial hearted, and open for the world. To Liisa, my inspiration in life and academic mentor, thank you for believing in me, encouraging me, and enriching my life every single day.

Table of contents

Glossary

Administrator
The user role that can manage a web site, and access its settings. Webmaster.

Architecture
In this thesis, the architecture of a product refers to the overall design of the product, its functionality, and how it interacts with other systems.

Blog
Web log. A website that publishes regularly posts which can be viewed on a chronological order.

CMS
See Content management system.

Code snippet
A given set of programming code that can modify the functionality of an existing solution. A hack.

Content management system
Web-based system that enables to create, modify, rearrange, or delete contents of a website, and control its settings.

Core product
In this thesis, used as a word to mean the FOSS product without any extensions.

Customizing services
Not building a solution from scratch, but modifying an existing solution to suit end user's requirements.

Developer
A person who builds new software, or makes improvements to existing code base. A programmer.

Development framework
A set of tools and a platform that helps to decrease time to develop a new solution, or customize an existing one.

Drupal
The main competitor of WordPress. A content management system.

Extension
Software that complements an existing software product but does not work solely without it. Complements or modifies the functionality of software, or adds extra features.

FAQ
Frequently Asked Questions. Usually a website that decreases the need to contact personal assistance on most common user problems.

FLOSS
Free/Libre Open Source Software. See FOSS.

FOSS
Free Open Source Software. Look for a definition in chapter 2.1.1.

Freemium
A pricing model. The basic level of service is offered without a charge, but can be updated to a better level of service or more features for a price.

GPL
GNU General Public License. The most common FOSS license.

Hosting
Offering the web server and physical infrastructure, such as connections and security, that are required to have a website online.

Lead developer
A developer that is a key decision maker in the development of a software.

Module
See extension.

Open source software
See FOSS.

OSI
Open Source Initiative. A non-profit organization that controls the open source licenses and the definition of OSS.

OSS
Open Source Software. See FOSS.

Plugin
See extension.

Publishing platform
See Content management system.

Subscription-based service
A web service that can be used by paying a regular fee. Might have a starting fee, but usually the use of the service and subscription can be ended on a notice.

Testimonial
A customer review of a company, its product, or services. Often used at a company's website to increase credibility.

Theme
Similar to extension, but specifically controls the appearance and functionality of a website.

Web presence
The official website or a set of web services of an organization.

WordPress
A content management system for blogs that was founded by Matt Mullenweg in 2003.

WordPress.com
A web service that offers WordPress as a freemium subscription service. Owned by Automattic.

1. Introduction

1.1. Background of the study

During the Second World War, Finland suffered from severe demolition of infrastructure. Thousands of private homes were destructed and over 10% of Finland's population at the time were refugees without a home. At the same time, urbanization created a demand for new sub-urban areas. There was a massive demand for construction of new houses to be built – fast. (Kummala 2004)

Since the 1920's there had been many variations of model houses, a general detached house plan which included blue prints, construction instructions, and a list of required materials. The plans were freely available to anyone building a house. The first model houses were published by the government, but many local authorities, labour organizations and support societies were also providing their own plans, in many cases designed by well-known architects. In 1942 the Association of architects in Finland founded a Reconstruction office, with an aim that every architect in Finland would work two weeks every year pro bono for the office. They were working on to create general standards and help implementing those standards. Standardizing was seen as a key element for creating mass markets for house construction. (Kummala 2004)

This lead to the creation of the most popular model house, *rintamamiestalo*, translated literally as battlefront soldier house. It was a 1,5 floors square house that had four rooms built around a chimney. What made the model very popular was its modularity and possibilities to make the attic and basement as living areas, if needed. Compared to traditional ways of building houses, the model house was a good choice because it saved in architect costs and offered instructions to build the house even without the help of construction professionals. (Kummala 2004)

What also was an upside for the house owners was that the high number of built model houses enabled businesses to standardize their sales: architects were able to offer design of extra modules, construction companies could help in any phase of the construction process, hardware stores were able to sell standard materials and bring costs down. Also industrial

chimney and oven manufacturers could standardize their products to suit the model. Building new model houses ended in the 1960's and was replaced by commercial house packages, a spin-off from open models. (Kummala 2004)

The case of the battlefront soldier house is a good example of a free platform that has enabled a standardization of business and developed a business ecosystem around an openly available model. There was a large demand to build quickly and a lot of available talent to make it happen. Also the open standardization improved the whole commercial house building industry, and ultimately it offered an inexpensive and well-developed solution for the end-user, the inhabitant.

Fast forward half a century, the emergence of the world wide web created a huge demand for publishing tools. The Free Open Source Software (FOSS) movement has been an active contributor. During the past two decades, there has been thousands of FOSS publishing tool projects that haven't got the traction to become a suitable solution for mainstream use. From the variety few FOSS publishing platforms have come to dominate the industry: Drupal, Joomla, and the most popular, WordPress (W3Techs 2013f).

The case product in the thesis, WordPress, is a blogging and content management tool that is used by millions of bloggers and website owners around the world – including many leading media houses. The first time I got introduced to WordPress was in 2006. I have worked as a consultant and built dozens of websites for my clients, so I got interested about WordPress as a content management platform that my clients could use themselves to update the contents of their website. The modular structure of WordPress appealed to me. I could modify the layouts of the site freely, take advantage of the thousands of available plugins to improve the site's functionalities and still be able to update the core product to new versions.

I have witnessed the power of a FOSS product to enable small scale business, and have been fascinated about the future possibilities of FOSS applications. I believe the philosophy will play an important role in solving some of the wicked problems and enable innovations we will see during the following decades. Along my management studies, I have also followed the discussion related to open innovation and business models. This is why I also hope to

contribute to the discussion through a deeper level of understanding from the FOSS community, and the business models in their extension ecosystems.

1.2. Outlining the research

In this research, my interest focuses on the extension ecosystem of modular free open source software (FOSS) products. Extensions are products that provide added value to an end-user through customization or added features that don't exist in core product.

Already today, FOSS products such as Linux and Android enable a big part of our digital infrastructure and shape the way we use technology (Kirstein 2008). Much of our smart phone use happens through applications, which is a good example of the extension ecosystem. I believe that we are seeing many FOSS success stories taking their place in our daily lives, thus creating business opportunities for companies to customize these products to suit better the needs of users through extensions. Therefore, in order to capture some value from this ecosystem, it is important to understand the business models and their building blocks.

Objectives for my research are to contribute to the discussion on business models, and to raise the awareness of the ecosystems that are build around FOSS products. Examples of companies like MySQL and Red Hat Linux have been used a lot in the media and academic discussion on FOSS products (An open secret 2005; Schoonmaker 2007), but they represent only a surface of the phenomenon. There are thousands of small companies that are benefiting from FOSS ecosystems and can respond to niche needs by end-users better than the larger corporations (Rapoza 2008). I believe there is a gap in the current literature, that requires more attention to extension ecosystems.

In my research I am trying to find an answer to the question: *What kind of business models exist in extension ecosystem of FOSS products?* In order to answer to this, I will have to understand the theory and concepts of business models, ecosystems, and FOSS products. I will review these concepts and their synthesis in the literature review.

The main academic framework used in this study is the business model canvas (Osterwalder & Pigneur, 2010). It is based on the authors' research on the business model ontology, and a

holistic view on how the business model is constructed and can be analyzed. Currently, several business models have been identified in FOSS business ecosystems. The business models enabled by the extension system are called hybridization models, divided into selling proprietary extensions and dual licenses (Chesbrough 2007). In my research my aim is to either prove this classification true, or replace it with new findings.

I have chosen WordPress as the case study for this research, because it is the most popular web publishing platform, having almost every fifth website using it as their content management system (W3Tech 2013a). To avoid confusion, it is important to make a distinction between two products, which are easily mixed in conversations: WordPress and WordPress.com. WordPress is a downloadable software that has to be self-installed on a web server. WordPress.com, on the other hand, is a commercial web service that offers a hosted version of WordPress, and does not require any advanced technical skills. Therefore, I am focusing my research on WordPress, which is the core product, and WordPress.com merely a derivative business that benefits from the development of the FOSS product. I will describe the case product, its development process, development community, and business ecosystem in more detail.

The business model analysis of this research is based on 64 companies that provide theme extensions to WordPress. I have used a pattern matching technique to find distinct business models with reoccurring features. Based on the analysis of these companies, I suggest as my key finding that there are four distinctive business models in the extension ecosystem, which I have named as Publishers, Turnkeys, Clubs and Boutiques.

The structure of this study follows a traditional form, initially covering the academic literature, introducing case, explaining the analysis and results, and discussing these results in the context.

The second chapter introduces the current literature on the foundations of basic concepts and reviews other academics' research about my topic. In the third chapter, I will explain the research design and describe the research methods I have used.

I have divided the analysis of the results in two sections. The fourth chapter describes the case product WordPress to understand the basic concepts and business ecosystem emerged around it. After this, I have analyzed the business models in the extension ecosystem in more detail. Therefore, the fifth chapter covers the most important analysis of this research. In the sixth chapter I take the results of the analysis further and describe four distinctive business model patterns that I have found inside the extension ecosystem. These findings are my contribution to the literature on FOSS business model categorization.

In the last chapter I will then conclude the findings of the research, locate them in the current literature, and evaluate the validity of my research. I will also suggest subjects of further study, based on my subjective notes on the issue.

2. Literature review

In order to research the business models of FOSS extension ecosystems, I will first create an understanding on some of the basic concepts, and also go through what the academics have already researched considering my subject. Because of the technical nature of this study, I will first try to explain the concept of FOSS, and the business ecosystems that can emerge around it. Furthermore, I will cover the academic discussions on business models, and introduce some of the categorization on FOSS business models that have been covered in the literature. I will also select the frameworks that I will be using to do my own research on the topic.

2.1. Free open source software

A traditional way of developing software has been based on the proprietary development, in which a developer owns the intellectual property rights (IPR), including the source code and distribution rights, and creates revenue through selling the software (Watson 2008). The FOSS movement has been brought to broad audiences' attention through such successful software products as Linux operating system, Firefox web browser, or mobile phones running on Android OS. Lemley and Shafir (2011) state that the rise of open source software poses an important challenge to the classic production of intellectual public goods. Open source products rely on keeping the software and any improvements or additions to it free and widely accessible. This means that the providers of software will have to find other business models than selling copies of the software. Krishnamurthy (2005) goes even further to state that FOSS products are able to compete with large companies on an equal footing and even defeat them. Therefore, they should not be taken lightly or dismissed.

To understand how business can be possible to be built on top of open source products, we will first have to understand open source better. In this chapter, I will go through recent literature on FOSS and development, and the structures that enable building business on top of it.

2.1.1. Defining Free Open Source Software

The literature refers to the phenomenon of FOSS using different terminology. Besides FOSS, the most common abbreviations are OSS (Open Source Software) and FLOSS (Free/Libre/ Open Source Software).

As the concept of FOSS is widely community-driven and evolved over time, there are some different definitions and schools inside the community. Open Source Initiative (OSI), founded in 1998, claims to be the steward of the open source definition and community-recognized body for reviewing and approving licenses as conferment to this definition. (Open Source Initiative 2013a) They control the definition through a list of 70 licenses. For a project to follow open source licensing, it has to pick a license from this list (Onetti & Verma 2009; 68).

According to OSI, open source is defined by the license under which the software's source code is distributed. Open source does not just mean access to the source code, but also the distribution terms of open-source software must comply with a certain criteria (Open Source Initiative 2013b). These criteria include the arguments for free distribution, openness and accessibility of the source code, ability to create derivative works and liability to distribute them under the original license. The criteria also makes clear that an open source license cannot discriminate any person, group or field of endeavor, or be restricted to any certain technology or product.

A critical view on the existence of OSI and its open source definition is presented by Stallman (2009), who was involved in the launch of a free operating system GNU in 1983, and the license under which it was released, called GNU General Public License, known as GPL. Stallman prefers the term free software, and claims the two terms describe almost the same category of software, but they stand for views based on fundamentally different values. Open source is a development methodology, where as free software can be seen a social movement. He makes a point that free software is an ethical imperative, essential respect for the users' freedom. On the other hand, open source considers the software development in a practical sense only. Stallman also states that all existing free software would qualify as open source. Nearly all open source software is free software, but there are exceptions. Stallman (2009) defines free software as follows:

> *When we call software "free," we mean that it respects the users' essential freedoms: the freedom to run it, to study and change it, and to redistribute copies with or without changes. This is a matter of freedom, not price, so think of "free speech," not "free beer."*

Although the definition of open source software by OSI also takes into account the freedom to use, modify and distribute the software, in this paper I will be using the term FOSS to refer to free open source software that besides practical aspects of the development takes into account the community perspective, and underlying values of freedom. To be consistent, I will also use the FOSS term when citing other resources that are using other terms such as OSS or FLOSS to describe the same phenomenon.

To research FOSS in academic terms, Agnihotri et al. (2012) have made an effort in theorizing the phenomenon. They outline the dynamic structure of the FOSS projects through a complex adaptive system approach, taking account motivation perspective, social identity theory, public goods theory, social network perspective, and organization perspective. Agnihotri's research group suggests that the phenomenon can be explained and studied from three main theoretical main perspectives: the community, the process, and the outcome.

The participants of FOSS projects construct a community, that is based on virtual bonds among the community members. Such participants are not assigned roles by any central authority. Instead, they pick duties related to their personal interests. The interdependence among resources influences the flow of information between and within different user and developer communities. The primary motive of FOSS is to resolve a problem and to come up with the best solution. Furthermore, the key benefits of FOSS products include the trimmed costs of the software, and a superior product in result due to more public access. In case of deficiencies, making modifications is faster compared to proprietary software products. (Agnihotri et al. 2012)

2.1.2. FOSS development

FOSS development is "collaborative, community model of development, based on a process that does not allow any contributor to exert a proprietary claim to intellectual property on any

portion of the code being developed within the open source framework" (Chesbrough 2006; 43). On a more practical level, a typical FOSS project is comprised of central developers who do most of the coding and peripheral members who contribute in a more indirect and irregular manner (Agnihotri et al. 2012).

FOSS projects must compete against each others for contributors, and sustain their participation over time. Most projects do not succeed in this competition, driving several projects to end. Many open source projects rely much on the development by programmers on the payroll of large corporations. As every community has insiders and outsiders, the insiders typically lead the community and control the direction of its agenda. Most open innovation communities are meritocracies, in which power is based on the contribution to achieving mutual goals. (Chesbrough 2007)

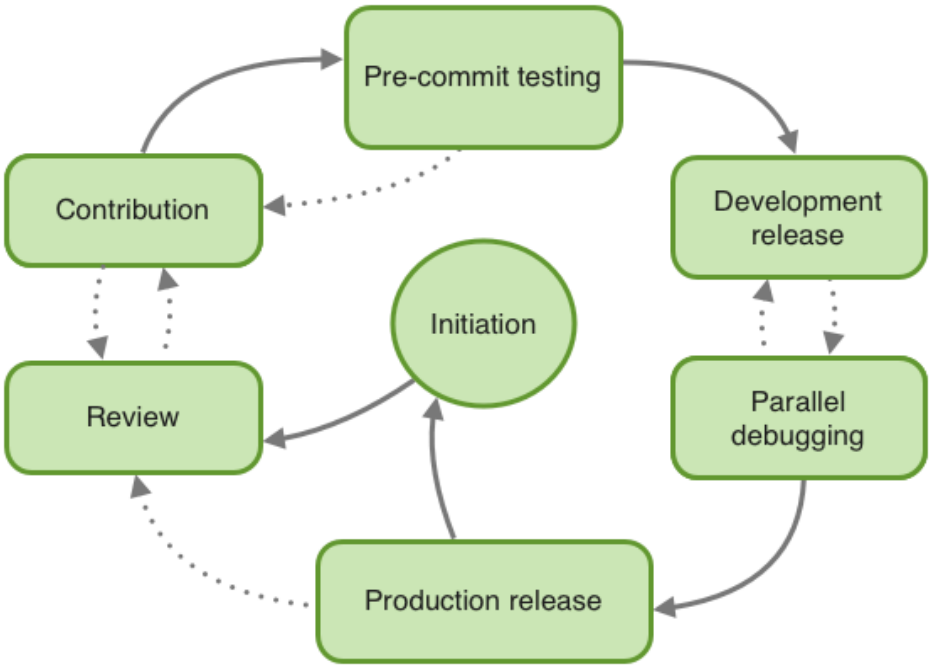

***Figure 2.1**: The Life cycle model of FOSS projects. (Roets et al. 2007)*

There are several basic differences between FOSS development and traditional proprietary software development methods such the system development life cycle, that goes through the stages of planning, analysis, design, implementation and support. They claim that FOSS development differs because of its open environment. The FOSS development model tackles

various sources of problems related to issues such as parallel development, prompt feedback, parallel debugging, user involvement, and developer contributions. (Kaur and Singh 2011)

Roets et al. (2007) suggest a life cycle model of FOSS development projects, that is presented in Figure 2.1. The development model is based on releases, which are initiated by a highly skilled small group of people, and in which the production goes through stages of review and contribution, pre-commit testing, development release and parallel debugging, finally towards a stable production release. The model is iterative and allows distributed work to be taken place.

2.1.3. The effect of licensing to business opportunities in FOSS

Software is protected by IPR legislation but some of the rights of its original author can be abandoned by releasing the software under a specific license. The license choice determines what companies can do with their software and impacts strongly on the business model. Therefore, business model decisions follow license choice. (Onetti and Verma 2009) GNU General Public License, also known as GPL, is by far the most common single license, in 2006 consisting a 54% share of all licenses used in open source software projects. As an example, Linux was originally released under GPL by Linus Torvalds (Onetti & Verma; 2009, 72).

GPL is based on four freedoms: freedom to use the software for any purpose, freedom to change the software to suit one's needs, freedom to distribute the software to anyone, and freedom to share the changes one makes (GPL License 2013). GPL is distinguished from other FOSS licenses as strong copyleft license, since it requires that derivative work should also be distributed only under the same license (Onetti & Verma 2009). However, if the modified code is not distributed with anyone outside the legal entity of the modifying party, there is no obligation to distribute modified code to anyone.

How is it then possible to do business based on GPL licensed products? The website of Drupal, one of the most popular FOSS content management systems with a 7.2% global market share (W3Tech 2013e) explains how GPL applies to complementary products such as modules or plugins (Drupal 2013). They refine that GPL applies to extended code that

interacts with the original code, but not to data. This means that because Drupal's code is under GPL, all code that interacts with it must also be distributed under the same license. But any files, such as images, stylesheets or browser scripts, that the code sends to the browser are not affected by the GPL because they are data. This, again, makes it possible to create extensions that utilize data that is under another license than GPL, and monetize this part as an added value service. Onetti and Verma (2009) refer to this as dual business model, which is not based on one integrated license, but an integration of GPL and proprietary license.

Business can be based on FOSS products in two ways. First, they can incorporate the source code of an existing product in a larger code base and create a new product. Second, they can also take an entire FOSS product and bundle it with existing products. To describe both cases, the term derived products is used. The source code for the derived product does not need to be disclosed and distributed freely since the license is not GPL. (Krishnamurthy 2005) Figure 2.2 shows the business model of GPL software producers, in which the producer is monetizing through derived products and services.

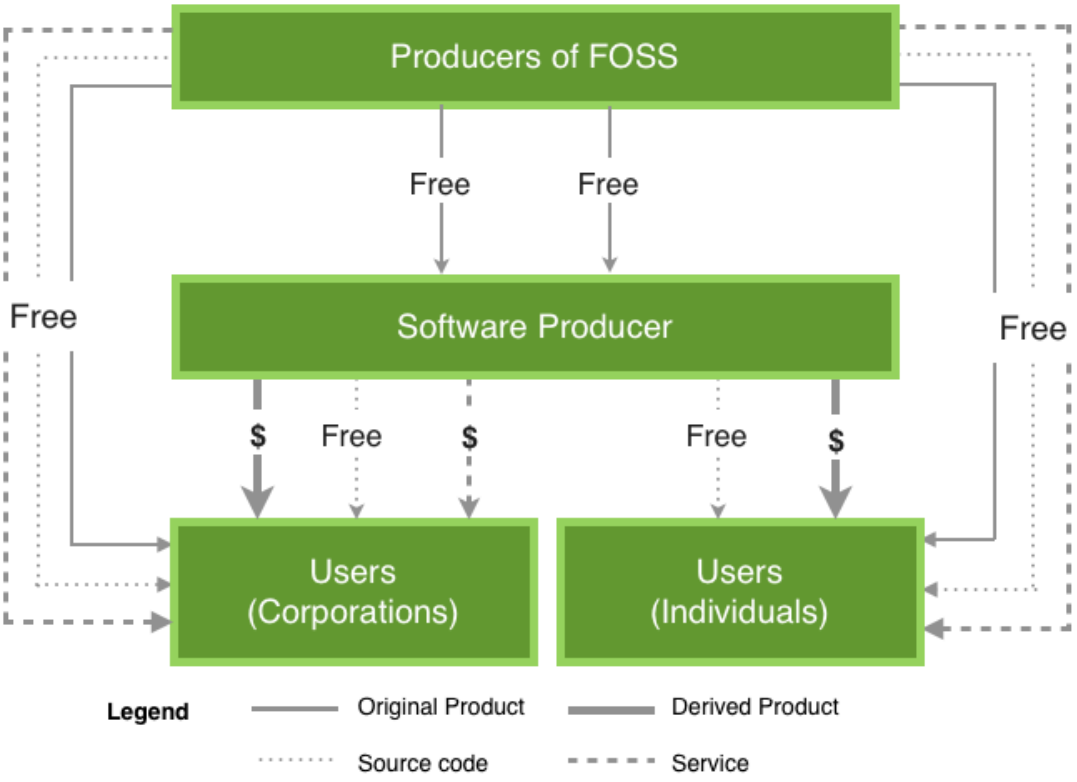

***Figure 2.2**: Business models of GPL Software Producers. Krishnamurthy (2005)*

Therefore, business can be built on derived products and services. Allen (2012) reports on a new kind of ecosystem that has emerged around FOSS products. In these ecosystems, small businesses, individuals seeking donations or advertising revenue, and individual volunteers cooperate by creating extensions to FOSS products. The creation of these extensions is enabled by a modular structure.

2.1.4. Modular structure of FOSS products

Linux is a good example of a FOSS product that became successful because of its modular structure (MacCormack et al. 2006). Without modularity there would have been less possibilities for volunteers to contribute in a meaningful way, develop new features or fix existing defects without affecting many other parts of the system. Authors call out for an architecture for participation that promotes the ease of creating small contributions.

Modular systems are "nearly decomposable systems that preserve the possibility of cooperation by adopting a common interface" (Langlois and Garzarelli 2008). This common interface enables, governs, and disciplines the communication among subsystems. Product extensions are one way of taking advantage of the modular design to make user contributions more accessible than attempts to contribute directly to the code base (Allen 2012).

FOSS production is an organizational form that relies on modularity driven by supply and demand. The demand is created by idiosyncratic user tastes and requirements that require both high quality and customization. On the other hand, the supply is created by the benefits of specialization by comparative advantage and the large and diverse talent pool. There can be economies of scope in an open modular system, when visible design rules constitute a shared fixed investment that everyone can reuse in creating new extensions. These visible design rules can be divided into three main elements: architecture, interfaces, and standards. An architecture describes what modules will be part of the system and what their functions will be. Interfaces describe how the modules will interact and communicate with both the core product and each other. Standards test a module's conformity to the design rules and measure the module's performance in comparison to others. (Langlois and Garzarelli 2008)

The modular structure of FOSS products enable the emergence of business ecosystems around these products. Next, I will cover some of the literature on FOSS business ecosystems.

2.1.5. FOSS Business Ecosystems

The concept of ecosystem in the business literature has its roots in biology. More than any other type of network, a biological ecosystem provides the best analogy to understand a business network. Biological ecosystems, like business networks, consist of loosely interconnected participants that depend on each other for mutual effectiveness and survival. Therefore, competition, co-operation, and natural renewal exist in successful ecosystems. (Iansiti and Levien 2004)

Moore (1996) defines business ecosystem as an economic community supported by a foundation of organizations and individuals which are interacting. Moore sees them as the organisms of the business world. Peltoniemi and Vuori (2004) have gone through the different definitions of business ecosystems and came to a conclusive definition of business ecosystem as "a dynamic structure which consists of an interconnected population of organizations". Furthermore, they define that business ecosystems are not by definition existing inside individual organizations.

Business ecosystems should also be self-sustaining, and they develop through self-organization, emergence and co-evolution. (Peltoniemi and Vuori 2004) Both competition and cooperation exist in a business ecosystem simultaneously. Successful business ecosystems require the absence of protectionism and support for co-operation even in competitive environment. Iansiti and Levien (2004) suggest there are critical success factors of a business ecosystem such as productivity, robustness and ability to draw competitive advantage from many sources, and the ability to create niches and opportunities for new firms.

Like in a biological ecosystem, a business ecosystem consists of actors with different roles. Moore (1996) suggests that a business ecosystems' roles include customers, lead producers, competitors, and other stakeholders. Furthermore, key to business ecosystems are the leadership companies, referred to as keystones, which are leading the co-operative efforts. Alongside keystones Iansiti and Levien (2004) suggest other roles to be niche players which

make up the largest mass of the business ecosystem, dominators, and landlords which take advantage of the resources of the ecosystem but do not contribute to it – which by Moore's definition can include the customers.

There are seven main roles inside a FOSS community: FOSS developers and project communities, software distributors, software producers and vendors, hardware producers, third party service providers, other business types, and end users. Software distributors sell, integrate, assure quality, and offer services related to the FOSS product. Software producers and vendors include FOSS product as part of their offering and lower their total production costs. Third party service providers offer value added services such as technical support and assistance. Hardware producers incorporate FOSS to support their hardware (e.g. Android phones). The end users can be either enterprise users or individual home users. The previous group is generally more willing to pay for value added services in greater extent. (Androutsellis-Theotokis et al. 2010)

It can be stated, that the research of FOSS business ecosystems is still in its infancy. Allen (2012) suggests that IT-based value networks of open innovation with a significant small business presence is worth exploring in more detail. He notes that the examples of co-creation networks in literature have focused mainly on large corporations collaborating in supply chains, crowdsourcing of large corporations, and FOSS communities of individual volunteers. This note encourages also the objectives of this study.

2.2. Business models

The concept of business model is relatively new topic in academic literature. It has been introduced already in the 1960s (Chesbrough & Rosenbloom 2002) but only at the end of the 1990s it has rose to prominency among academics (Osterwalder et al. 2005, 6). The concept has been originally used in the context of strategy literature (Amit & Zott 2001; Hedman & Kalling 2003), but it has become a widely used term to describe some level of simplification on the business logic of companies, used also in the fields of entrepreneurship, information systems, economics, and innovation (e.g. Amitt & Zott 2001; Hedman & Kalling 2003; Sabir et al 2012; Timmers 1998).

Some authors are using the terms strategy and business model interchangeably, while business model can be seen as a system that shows how the pieces of a business fit together, but strategy includes also the competition (Magretta 2002). Moreover, business model concept can be seen as bridge between company's strategy and operations (Mäkinen & Seppänen 2007) or as a conceptual and theoretical layer between strategy and processes of a business (Rajala & Westerlund 2007).

From the innovation perspective, business models are becoming even more critical source of innovation than technology (Osterwalder & Pigneur 2010). It has even been stated that a mediocre technology pursued with a great business model may be more valuable than a great technology exploited with a mediocre business model (Chesbrough 2010). This gives enough reason to highlight the significance of business models in the context of innovation.

Although the terminology on business models seems to be rather varied, I will make an effort in this chapter to define the concept of business model used in this study, and select a framework to apply in my research.

2.2.1. Defining business models

The term business model is used in academic literature widely (e.g. Afuah & Tucci 2003; Linder and Cantrell 2000; Hamel 2000; Chesbrough & Rosenbloom 2000; Magretta 2002), but when different authors write about business models they do not necessarily mean the same thing (Osterwalder et al. 2005; Rajala & Westerlund 2007). Business model components used by authors vary so widely that they seem to talk about different things like resource, strategy, product innovation, brand, cash flow when using the term business model (Wu & Zhang 2009). Many authors write about business models when they really only mean parts of a business model (Osterwalder and Pigneur 2010). As a widely used example, an online auction is not a business model but a pricing model, thus only a part of the business model. Altogether, business model should be understood as a holistic concept which embraces every aspect that affects the value creation and efficiency of the business.

Magretta (2002) states that business model concept is drawn from Peter Drucker's (1954) basic questions about the customer and value creation. Therefore, business model should answer to two fundamental questions; first related to the value created to the customer and the second to the organization's capability to capture value in the process. Thus, business model refers to the logic by which the organization earns money. (Magretta 2002)

Pillar	Business Model Building Block	Description
Product	Value Proposition	Gives an overall view of a company's bundle of products and services.
Customer Interface	Target Customer	Describes the segments of customers a company wants to offer value to.
	Distribution Channel	Describes the various means of the company to get in touch with its customers.
	Relationship	Explains the kind of links a company establishes between itself and its different customer segments.
Infrastructure Management	Value Configuration	Describes the arrangement of activities and resources.
	Core Competency	Outlines the competencies necessary to execute the company's business model.
	Partner Network	Portrays the network of cooperative agreements with other companies necessary to efficiently offer and commercialize value.
Financial Aspects	Cost Structure	Sums up the monetary consequences of the means employed in the business model.
	Revenue Model	Describes the way a company makes money through a variety of revenue flows.

Table 2.1: *Nine building blocks of a business model. Osterwalder et al. (2005, p18)*

The concept of value creation and capture is strong among the definition of business model in the literature. Business model is a description of the value that a company offers to one or several segments of customers, and of the architecture of the firm and its network for creating,

marketing. It describes the way in which a business turns market opportunities into profitable and sustainable revenue streams. (Osterwalder et al. 2005, Rajala and Westerlund 2007)

Osterwalder and Pigneur (2010, 14-15) simplify the definition of business model through the organizational point of view and value as the main outcome of organizational activities:

> *"Business model describes the rationale of how an organization creates, delivers and captures value."*

Based on a literature synthesis and comparison of business model definitions, Osterwalder et al. (2005) suggest a business model ontology used to describe business models. This ontology is described in the nine building blocks, as seen in Table 2.3.

2.2.2. Business model patterns

The business model definitions used in literature can be classified in three different categories which are hierarchically linked to each other (Osterwalder et. al 2005). The first level is *overarching business model concept*, which tries to explain the theoretical framework that can be applied to all businesses. This level consists of definitions of what a business model is and what belongs in them and meta-models that conceptualize them. The second level is *taxonomies*, which consists of several types or meta-model types of business models that are generic but contain common characteristics. The third level is *instances*, which try to conceptualize, represent, or describe concrete real world business models.

Business model patterns can be defined as business models with similar characteristics, similar arrangements of business model building blocks, or similar behaviors (Osterwalder & Pigneur 2010; 55). Patterns make it easier to understand the dynamics of business models and compare how similar businesses function. Also, a single business can incorporate several patterns.

In this research, I will use the business model canvas as an overarching business model concept to analyze the case companies. Their individual business model instances are analyzed through pattern matching, trying to find business model patterns and suggest

taxonomies that explain the meta-model types of businesses. These taxonomies are then compared against the current literature on the business models of FOSS extension ecosystems.

2.2.3. The business model canvas

The literature on business models has moved from general definitions and taxonomies to suggesting frameworks (Sabir et al. 2012). Several authors have proposed frameworks and building blocks to standardize the discussion on business models (e.g. Casadeus-Masanell & Ricart 2010; Mahadevan 2000; Mason & Spring 2010; Morris et al. 2005, Osterwalder & Pigneur 2010; Pauwels & Weiss 2008).

Yet, one framework has gained popularity not only in the academic literature but also in management literature and discussion in general so much that it has become a platform for business model innovation (e.g. Blank & Dorf 2012; Chesbrough 2013; Maurya 2012; Sibbet 2012). Based on their research and co-operation with business developers, entrepreneurs and consultants, Osterwalder and Pigneur (2010) developed a tool called business model canvas to define and visualize a business model. I will be using the canvas as a tool in the analysis of this thesis.

The business model canvas, as described in Figure 2.3 is based on nine building blocks that base in the business model ontologies in Osterwalder's et al. (2005) previous research. The canvas can be used as a tool to visualize and understand the business model and the interrelations inside its building blocks. I will explain the building blocks as they are defined by Osterwalder and Pigneur (2010, 12-49).

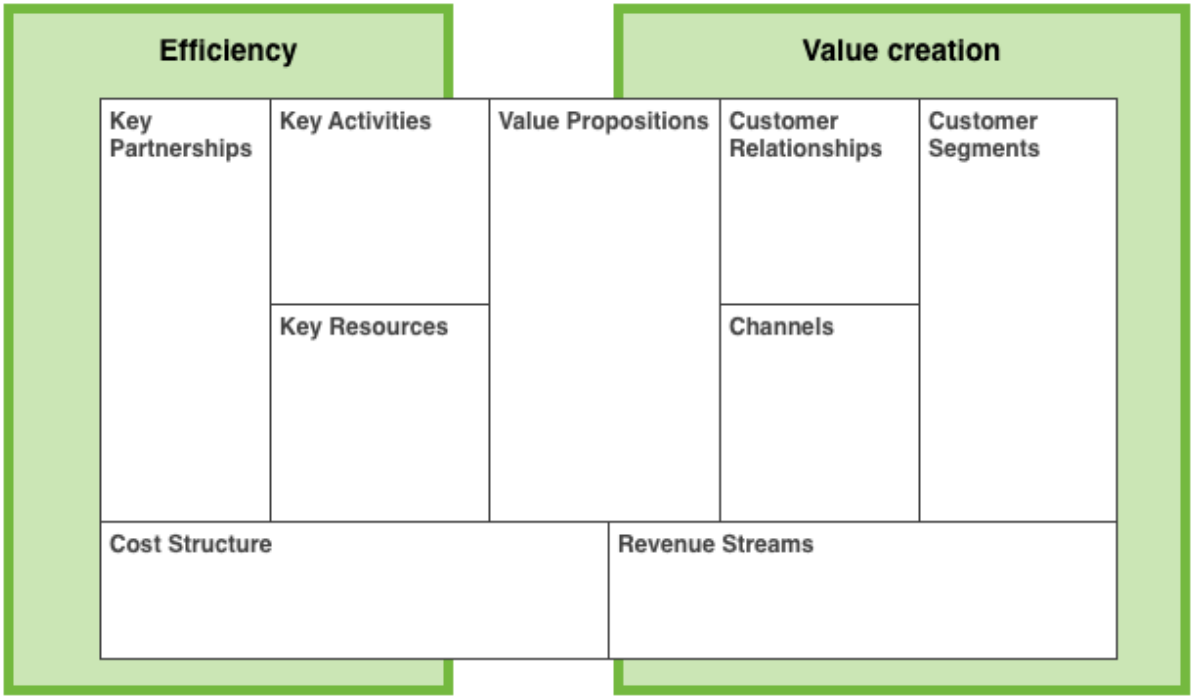

Figure 2.3: *Business model canvas can be divided in two sections: the efficiency building blocks and the value creation building blocks. (Adapted from Osterwalder & Pigneur, 2010)*

1. *Customer segments* define the groups of people or organizations the company is serving and creating value to. There can be one single or multiple distinctive customer segments.

2. *Value propositions* create value for a specific customer segment through the products and services of the company catering to that segment's needs. The building block describes the value the company delivers to the customer. Value may be quantitative or qualitative.

3. *Channels* describe how a company communicates with and reaches its customer segments to deliver a value proposition. Osterwalder and Pigneur (2010, 27) distinguish channels between company's own and partner's channels as well as to direct and indirect channels.

4. *Customer relationships* explain the types of relationships the company establishes with specific customer segment. The relationship can vary from personal assistance or self-service to automated services, communities and co-creation.

5. *Revenue streams* represent the cash a company generates by delivering the value proposition to customer segments. There can be a single or multiple revenue streams which can vary from asset sales to subscription, leasing and licensing. The pricing mechanism can be fixed or dynamic. Freemium model can also be a part of the revenue streams.

6. *Key resources* are the most important assets required to deliver the value proposition and make the business model work. The assets may be tangible or intangible, financial, or key people.

7. *Key activities* are the most important things a company must do to deliver the value proposition to customer segments and make its business model work.

8. *Key partnerships* constitute the network of suppliers and partners that make the business model work. Partnerships can include strategic alliances, alliances with competitors, joint ventures and buyer-supplier relationship.

9. *Cost structure* describes all costs that occur from key activities delivering value proposition to customer segments and operating the business model.

The canvas can be divided in two important sectors: the left hand side of canvas including key partnerships, key activities, key resources and cost structure represent the efficiency of business model. The right hand side including value propositions, customer relationships, channels, customer segments and revenue streams represent the value created in the business model. In this research I will be focusing more on the value creation side of the canvas. (Osterwalder & Pigneur 2010; 49)

2.3. FOSS Business models

In order to understand the business models in FOSS ecosystems, I will first take a look at the business models of software distribution and see how they relate to those of the FOSS ecosystem. Then, I will go through some of the categorizations made on FOSS business

models by previous authors. After this, I should be ready to make some conclusions based on the literature and how it supports my research.

2.3.1. Business models of software distribution

Watson et al. (2008) have distinguished five business model taxonomies of software production or distribution: proprietary, open community, corporate distribution, sponsored FOSS, and second-generation FOSS. I will briefly describe them in the following paragraphs.

The proprietary model has been the industry standard for decades. In this model, companies hire programmers to develop software and customers buy it. The source code is an important intellectual asset and is protected by legal IPR and encryption. Proprietary firms rely heavily on both copyrights and patent law to protect their intellectual property from duplication and competition.

Open communities rely in the work of volunteers with limited or no commercial interest in the development and support of software. According to Watson et al. this model dominates the FOSS movement in terms of number of projects.

Corporate Distribution of FOSS refers to companies that are creating value by improving distribution methods, and providing complementary services in order to make these FOSS products accessible to broader markets. An example of such company is RedHat, which distributes Linux for its customers by offering a guarantee and services, which are valued by enterprise customers.

Sponsored FOSS refers to projects that are funded partly or completely by foundations and corporations. A good example of sponsored FOSS is Linux Foundation, which coordinates the development of Linux and is funded by companies like IBM, Intel, HP, and Oracle, that are using the operating system as part of their offering. Chesbrough (2007; 68) is worried about the impact of sponsorship against the diminishing role of individuals in the ongoing governance of Linux against corporations, that are making contributions granting roles in the insider group.

Second-Generation FOSS companies generate most of their revenues by providing complementary services around their products, like corporate distributors of FOSS. However, they differ from other software distribution business models that they do not sell licenses for their products, and they control the development of FOSS product. Therefore, they can exploit their knowledge of the code to provide higher-quality service than potential competing service providers.

Ecosystems evolve around Second-Generation FOSS companies (Watson et al. 2008). In relation to the business ecosystem theory, these companies can be taken as the ecosystem keystones. Although, they don't recognize the ecosystem's niche players or other business models in their theory, but rather refer to external companies benefiting from the existence of the Second-Generation FOSS companies.

2.3.2. Categorizing FOSS business models

Many authors have categorized the business models in the FOSS ecosystems. As Osterwalder et al. (2005) have noted, these authors may not be talking about the same things, or refer only to some components of a business model. Altogether, I will try to make a synthesis of the literature so far in this chapter.

Viable business model has to generate revenue in a sustainable manner (Onetti and Verma 2009). Therefore, it is important for FOSS companies to put attention to the revenue drivers. There are two main sources of revenue: license fees from sales of software and professional services. Krishnamurthy (2005) proposes three fundamental and sustainable business models for FOSS: Distributors of software, Software producers (GPL and non-GPL) and the Third-Party Service Provider. This resembles with the theory of Androutsellis-Theotokis et al. (2010) on FOSS business ecosystems.

Chesbrough (2006; 44) does not see FOSS as a source of business de facto, but rather views it from the IPR angle. He suggests that there are strong social norms and legal protections, crafted to discourage profiteering on the work of the FOSS community. Although, business opportunities are available based on using FOSS product as a key element in the business. Chesbrough (2006, 45) lists four major business models that profit from open source software,

ranked from lower to higher value added: installation, service and support, versioning the software, integrating the software with customer's existing IT infrastructure, and providing proprietary complements to open source software.

Chesbrough (2007) states that business models novel to FOSS include the development of proprietary extensions, also referred to as modules, add-ons or plugins. Companies pursuing this type of business model choose an FOSS license to help proliferate the product and then offer added value versions to paying customers, and these versions are generally more stable or have increased functionality. This model resembles the freemium model. Osterwalder and Pigneur (2010, 96) define freemium as *"business models, mainly web-based, that blends free basic services with paid premium services"*. Most of the customers will never pay anything for the services, but the small base of paid subscribers subsidize the free users. This is possible because of low marginal cost of a new user.

In his later work, Chesbrough (2007) has developed the business model categorization of FOSS further, based on the work of Perr et al. (2006). Chesbrough groups the business models of FOSS again in to four categories: deployment, hybridization, complements, and self-service. Compared to his previous work, these categories also have sub-categories. The business model taxonomy is presented in Table 2.2. The business models that describe the interest of this research, the extension business models, are categorized under the term hybridization. These models are based on dual licensing, and makes it possible to offer proprietary products that complement the core FOSS product. The subcategories are proprietary extensions to FOSS products, and dual licensing or versioning the product. My aim in this research is to either prove or replace the Hybridization part of this categorization.

Category	Model	Description	Example
Deployment	Support	Revenue derived from sale of customer support contracts.	JBoss
	Subscription	Revenue derived from annual service agreements bundling open source software, customer support and certified software updates delivered via Internet.	Red Hat Enterprise Linux
	Professional Services / Consulting	Revenue derived from professional services, training, consulting, or customization of open source software.	IBM
Hybridization	Proprietary Extensions	Firms broadly proliferate open source application and monetize through sale of proprietary versions or product line extensions. Variants include mixed open source/ proprietary technologies or services free trial or “community” versions.	SugarCRM
	Dual License	Vendor licenses software under different licenses (free “Public” or “Community” license vs. paid “Commercial” license) based on customer intent to redistribute.	MySQL
Complements	Device	Vendor sells and supports hardware device or appliance incorporating open source software.	Mazu Networks
Self-Service	Community Source	Consortia of end user organizations or institutions jointly develops applications to be used by all.	The Sakai Project

***Table 2.2**: Seven open business models in the context of FOSS (Chesbrough 2007).*

2.4. Conclusions from the literature

The literature introduced in this study provides a sufficient understanding on the concepts of FOSS and business models. In conclusion, FOSS is a phenomenon that has become a significant method in the development of software. FOSS can be addressed through the perspectives of the community, development process, and the actual outcome. The development of FOSS differs greatly from the models used to develop proprietary software. The open development model constitutes on the existence of multiple developers working on the product simultaneously, and pays emphasis on the iterative release cycle.

The modular architecture of FOSS products has enabled the participation of a larger developer community. The extension make it possible to contribute to the product without being involved in the development of the core product, and also provide customized niche solutions for the end-users. From the business opportunity perspective, the extensions provide a possibility to create a business model based on dual licensing model, selling proprietary software which complements the FOSS product.

The business model discussion is rather new to the academic literature. This shows in the ambiguous definitions and taxonomies on business models. The term is often used to describe only the revenue logic, when it should be viewed as a more holistic concept, explaining how the business creates and captures value. There has been several attempts to create a standardized framework for describing a business model. One of the most successful framework has been the business model canvas, which is applied also outside of the academic discussion. The canvas provides a good tool for analysis in this research.

In addition, the concept of a business model pattern was introduced. It describes a common set of building blocks that many businesses share, ultimately creating a business model taxonomy. In this research I will try to find business model patterns that could be generalized as taxonomies in the context of FOSS extensions.

Based on the literature review, the research on business models in FOSS extension ecosystems is still in its early days. It can be said that the modular architecture is creating new opportunities to build business on FOSS. Allen (2012) has pointed that the examples of co-

creation networks in literature have focused mainly on large corporations, and FOSS communities of individual volunteers. Yet, it is the web based value networks of open innovation driven by small companies, that will change the game. Encouraged by this and the literature on FOSS business ecosystems and business models, I believe there is room for a study to take a taxonomical view (Osterwalder et al. 2005) to business models of niche players such as proprietary extension developers inside the FOSS business ecosystem.

In my research, I will use the theories of FOSS development cycle (Roets et al. 2007), modular FOSS design rules (Langlois & Garzarelli 2008) and the business ecosystems (e.g. Moore 1996; Iansiti & Levien 2004; Androutsellis-Theotokis 2010), to describe and explain the case FOSS product. I will also use the business model canvas (Osterwalder et al. 2010) to analyze the business models of extension providers, and try to either validate or replace the categorization of Hybridization business models (Chesbrough 2007). I will outline the research methods of my analysis in more detail in the next chapter.

3. Research methods

In this research, I examine the business models of extension developers in a FOSS business ecosystem. I have chosen to use WordPress as the case product because it is a good example of a successful FOSS product, but it is not much researched. This chapter outlines the methods used in the research. I will base my research on literature on conducting case studies, and explain the framework for this study. After that, I will explain the methods I have used to describe the case product and analyze the business models. In the final part of this chapter, I will outline the evaluation criteria for my research.

3.1. Introduction to the embedded case study

There are two basic designs of case studies, single-case and multiple-case designs. The case study can also be holistic with single unit of analysis or embedded with multiple units of analysis. The basic types of designs for case studies can be seen in Figure 3.1. In this research, I have chosen to do an embedded single-case study of WordPress, against a general recommendation to base research on multiple cases. Yin (2003, 41) states that one rationale for selecting a single-case instead of a multiple-case design is that the single case represents a critical test of a significant theory. Based on the findings of Allen (2012), I have made the decision to cover WordPress as a critical case that can be used to test the theory and the research question.

According to Yin (2003, 43) an embedded case study is an evaluation of a single case with subunits. It differs from holistic case study, since embedded case study is not focusing on just describing the global nature of the case, but addresses more detailed aspects. In this study, the case is WordPress. Context is the discussion of business models in FOSS ecosystems, and the subunits are the business models of WordPress extension developers. Based on this, I have divided the study in two parts: first I will introduce the case product, and then conduct a deeper analysis on the business models of extension developers.

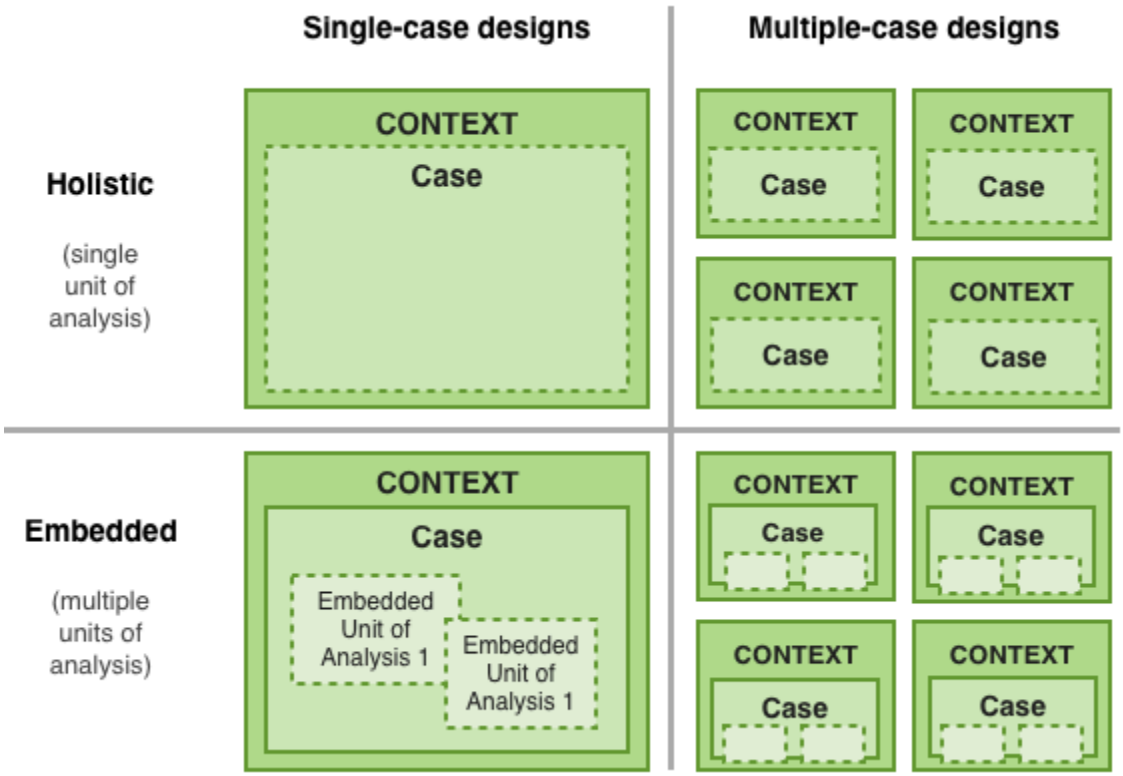

***Figure 3.1**. The basic types of case study designs (Yin 2003).*

3.2. Describing the case FOSS product

The objective of the first analysis is to create a general understanding of the case product and its key qualities which effect the observation of the business ecosystem and business model patterns inside the ecosystem. Allen (2012) studied WordPress extension ecosystem by analyzing popular plugins. In his research, Allen demonstrates the diverse roles that small businesses and users play in open software innovation. He found a surprising presence of small businesses, particularly consulting and small web development companies in the ecosystem of WordPress extensions, contributing a disproportionate amount of plugins that improved existing functionality of the software.

In his research, Allen (2012) showcased that small businesses act as customizers, making the platform more valuable for all users. He states that the WordPress extensions ecosystem is a perfect example of how small business can be at the heart of an open innovation network. Allen finds that WordPress community has been able to overcome the challenges of losing the

interest of its contributors, by supporting the contribution of stand-alone extensions and by allowing a business ecosystem with specialized roles to form. According to his study, the amount of extensions code is massively larger than WordPress itself, which makes a significant contribution to the business value of WordPress for potential users. Therefore, he notes that the case of the WordPress ecosystem is a good baseline and comparison point for the continuing study of open source business applications.

These findings encourage the selection of WordPress as a case ecosystem. For the case description, I have conducted research based on an interview and several internet sources. I have interviewed the founder and lead developer of WordPress, Matt Mullenweg, in San Francisco in November, 2011. The questions and themes of the interview are described in Appendix 3. I have also used "The State of the Word" speech (WordPress 2011), given by Mullenweg in September, 2011, which describes the status and roadmap of WordPress product. Together with these sources, I am using the official website of WordPress as an important source in different parts of the description. I am also comparing WordPress against other platforms, and detailing its market share. This information is based on independent analytics and research companies' reports.

In the case description, I will first briefly introduce WordPress and its history. Agnihotri et al. (2012) suggest that FOSS phenomenon can be understood through three main perspectives: community, process and outcome. Therefore, I will describe WordPress through perspectives of the development community, the development process, and the actual product. I will also describe the business ecosystem that has emerged around WordPress according to the roles discussed in the literature (Moore 1996; Iansiti and Levien 2004; Androutsellis-Theotokis et al. 2010).

The brief introduction to WordPress is based on the interview with Mullenweg, history of WordPress found on the official website, and on the findings from third party reports. The introduction is meant to help understand the context in which WordPress in working, and the significance of the case.

Based on evidence from the official WordPress website and interview of Mullenweg, I will talk about the developer community and the development process of WordPress. First, I am

going to detail the different groups of developers, and compare the findings against literature. After this, I will explain the process through different stages of the process and their outcomes. I will also visualize the process, and compare it to a theoretical model introduced by Roets et al. (2007).

Berndtsson et al. (2008) suggest that in order to describe a software product, it is important to implement it by oneself and prove the suggested benefits. Therefore, I have downloaded and installed the software myself. I am using the WordPress version 3.5.1, which was the latest stable release at the time of the study. In an attempt to visualize the structure of the product, I will introduce the key concepts and functions of the product from its users' point of view. I will also use this visualization to describe and explain the extension structure of WordPress, and describe the extensions that are available to develop.

To describe the business ecosystem around WordPress, I will make an effort to analyze the roles in the ecosystem through the theories of Moore (1996), Iansiti and Levien (2004), and Androutsellis-Theotokis (2010). I will refer to survey results of a questionnaire that was replied by 18,000 WordPress developer community members in 2011 at the official WordPress website. The results are available as anonymized data on the official WordPress blog (WordPress 2011). I will also visualize the actors in the ecosystem.

3.3. Business model analysis

In this research I am focusing on the WordPress theme developers, since they utilize the extension system of WordPress and base their business on a combination of GPL licensed code and proprietary licensed data, thus providing a sustainable basis for business models (Krishnamurthy 2005).

As a source of the theme developers, I am using the list of commercially supported GPL themes, available at the official WordPress website (WordPress 2013b). The data collection was done between March 28th and April 4th, 2013. At the time, the list consisted of 64 companies. It is important to note, that most probably the list does not cover all the companies in the business. Although, all developers that fulfill the requirements of GPL license and

submit to list will be featured, and the list is available at the official website. Therefore, I consider the list as a non-biased, and best alternative for a collection of companies offering commercial extensions.

I use the business model canvas (Osterwalder et al. 2010) as a tool to standardize the evidence collection and comparison of business models. The case study protocol is described in chapter 3.5. In order to understand the variations in business models, I will explain the results through each business model building block. The evidence will then be analyzed through the pattern matching technique (Yin 2003. 116). If patterns in similar building blocks or behaviors coincide, the results can help to answer the study's research question. I will also try to put the found patterns in to the ecosystem, and complement the visualization of the ecosystem I had outlined in the case description. If the findings can complement the theory of FOSS business models (Chesbrough 2007), I will also make suggestions on this.

As a critical point it is important to remember, that the analysis of business models is based only on publicly available information about the companies, and might not cover all the underlying factors. Also, accurate information about the efficiency building blocks such as key activities, key assets, key partnerships and cost structure, is difficult to get publicly. Therefore, the focus is mostly on the value propositions, customer segments, revenue streams, customer relationships and channels of the business models, and only make observation on the efficiency building blocks.

3.4. Evaluation criteria of the method

Yin (2003, 34-38) defines four criteria for judging the quality of the research design, and suitable tactics to address these criteria. These criteria are construct validity, internal validity, external validity and reliability.

The first criteria, construct validity, is defined as "establishing correct operational measures for the concepts being studied" (Yin 2003. 97). This spurs from the notion that investigator is often using subjective judgements to collect the data. The tactics to address the criteria is to use multiple sources of evidence, establish chain of evidence and have key informants review

draft case study report. A chain of evidence means that the reader should be able to follow the derivation of any evidence, ranging from initial research questions, method and analysis to ultimate case study conclusions. In effort to meet this criteria, I will try to build the thesis so that the different parts will form a consistent storyline, with cross-referring and being transparent on the methods, theories, and reasoning behind all of the decisions made during the research.

The second criteria, internal validity, is defined as "establishing a causal relationship, whereby certain conditions are shown to lead to other conditions, as distinguished from spurious relationships" (Yin 2003. 116). In a single case study addressing causal relationships might be difficult, or even impossible, so the tactics available are pattern-matching, explanation-building, addressing rival explanations and use of logic models. In this study, I will be using the pattern matching technique. It means that empirically based pattern are compared with a predicted one. If the patterns coincide, "the results can help a case study to strengthen its internal validity" (Yin 2003. 116). I will be defining the business model patterns based on recurring themes arising from the evidence, and match them agains the whole data.

External validity, as the third criteria for judging the quality of the research design, is establishing the domain to which a study's findings can be generalized. Case analysis in general doesn't rely on statistical generalization, but on analytical generalization. The attempt of this kind of study is to generalize a selected set of results in comparison to a broader theory. The goal in here is not to select a representative case of a theory, but mirror the findings of the case against the theory (Yin 2003. 38). The tactics to address the criteria are to use theory and replication logic. In my case study analysis, I will be reflecting the findings against the theoretical context represented in the literature review of the study.

In the analysis, it is important to remember to analyze the business ecosystem from a broad view. A critical pitfall of embedded study is that the study focuses only on subunit level and fails to return to the larger unit of analysis (Yin 2003. 45). This is why I will return back to the overall context of business models in FOSS ecosystems, and try to include my findings as part of this theory.

The final criteria, reliability, means demonstrating that the operations of a study, such as the data collection procedures, may be repeated with the same results. The tactics available to improve reliability are the use of case study protocol and developing a case study database. Case study protocol is a tool that helps standardizing the data collection. It defines the overview of case study, data collection procedures, case study questions and a format for data to put together the case study report (Yin 2003. 67). A case study database contains all the data that has been collected using the case study protocol. The case study protocol is presented in the next chapter.

3.5. The case study protocol

The objective for the case study is to analyze the business models of WordPress plugin developers and find patterns in them. The case study protocol will explain how the data has been collected, what data was collected, and how it is saved.

3.5.1. Field procedures

Evidence was collected based on the list of commercial themes found in the official WordPress website (see table in Appendix 2). Each company's website was visited and business model analyzed based on the case study questions presented in the next chapter.

Answers to each question was collected based on the website's structure, product offering, pricing model of products, communicated value propositions or benefits and other information the company tells about themselves. Also, some other information not related to the business model was collected, and research notes made. The evidence was collected using a web form that saves the answers to a database, from which the database was exported to spreadsheets for further analysis.

3.5.2. Case study questions

The following basic information was collected, if available, on each company: company name, website address, company size in employees, and country of origin. On the business model canvas, information was collected on value propositions, customer segments, revenue

streams, channels, and customer relationships. Also, observations about key assets, key resources and key partnerships were mede. Other observations and research notes were made, if there was something special in the studied company.

On the building blocks of value propositions, customer segments, customer relationships, channels, and revenue streams, I used lists of predefined values, that were crossed if they occurred in the case. The predefined values, listed in Appendix 1, were decided by going through the list of companies first with an empty business model canvas and finding elements that appeared in several cases. This made the collection of evidence more structured and improved the ability to analyze the data. Also additional observation taking was easier when the standard elements were left out of free-form notes.

3.6. Limitations of the study

This research has ambitious goals and makes bold suggestions. Therefore, I will have to raise several critical points related to it. First, the analysis of the research is based on a narrow sample of one FOSS product, and the source of these companies is from the WordPress community. Therefore, it may be biased and not representative of the whole phenomenon.

Secondly, my sources of evidence in this research are limited. The research does not take into account the financial success or customer desirability of the studied companies. The analysis is based on indirect sources from the companies' websites, which may not be suitable source of information for some companies, and is affected by the marketing goals of these companies. The description of WordPress development, community, and end product, is almost solely based on sources from within the community, such as the website, interview of the lead developer and observations on the tool. This is why I have also included supporting statistical facts about the significance of the case from objective outsiders, such as web analytics companies' reports. I also believe that 64 companies gives a sufficient enough sample to analyze the business models.

The third limitation of this study is that it is focused solely on the themes ecosystem. Therefore, it does not take into account the business models enabled by the other extension

system of WordPress, plugins. It is important to understand that there might exist more business models due to the nature of the plugin interface. For example, the can integrate premium third party solutions to WordPress, which for example many of Automattic's services are using. Researching these businesses may bring out new findings on the business models of the extension ecosystem. They are out of scope of this research, since I focused only on the businesses that base on selling a product, for example a pack of files that are based on some license and the end user can utilize them the way they want to.

Fourth point of critic is my personal involvement in the ecosystem which may cause some problems with objectivity. Despite the criticism towards the theoretical frameworks and methods of the study, I still believe it contributes to the discussion. Also, my experience from working within the ecosystem may turn to be beneficial in understanding the dynamics and pointing out some phenomena that outsiders would be hard to find.

4. WordPress publishing platform

Before I can analyze the business models of FOSS extension ecosystem, an introduction to the case product helps to understand the premises of such ecosystem. This chapter of the thesis will cover the case product, WordPress, and explain its history, significance, development process and, modular structure. I will explain WordPress using the theoretical framework introduced by Agnihotri et al. (2012), in which the phenomenon can be explained through the elements of community, process, and the outcome. I will also introduce the business ecosystem that has formed around the product and compare it to the literature. But first, I'll start by building understanding WordPress and place it in the context of web publishing.

4.1. WordPress in brief

The word blogging is abbreviated from words web logging. It is a form of publishing in the web in a chronological order, sharing thoughts, photos or other content, referred to as blog posts. In the early 2000s it became very popular way to express oneself and was fostered by tools that made it possible, such as Blogger, LiveJournal, TypePad, or Movable Type. They enable people to set up a blog and publish content through an easy to use web interface. The tools would then compile the web pages and others could access the blog through its own web address. Some tools were offered as web services for people with limited knowledge on technology, and some were FOSS tools that people could install and modify themselves. (Boyer 2011)

The first version of WordPress was released on May 27, 2003. It was initiated from a pure individual need, as the WordPress founder Matt Mullenweg had a need for such a tool. There was another open source blogging tool called B2, that Mullenweg was using and contributing to. He wanted to build something to suit his needs better, and started building WordPress with co-founder Mike Little.

> Mullenweg*: "I started developing a blogging software because I had a blog myself and I wanted a better software for it. In the early history basically I was*

contributing to blogging software B2. I was one of the people who carried the banner to build something new on top of it. And it was called WordPress."

The reason to make the software free came from the fundamental idea of building on top of others' work and make it somehow more interesting. Mullenweg trusts that it will gradually benefit for the good of all parties involved.

Mullenweg*: "The WordPress is based on an open source platform so it was a default choice. I have always believed philosophically in open source, it's the best way to build things. A lot what I have done has been based on open source. It's like good karma. I like to build things that others can build on top of and create something more interesting. I had used phpBB, Linux and some other open source software but B2 was my first experience in contributing to open source software. I actually hadn't had any experience in coding before I started developing WordPress."*

Mullenweg recognizes several tipping points that have boosted the popularity of WordPress. They have either been opening the service for new groups of users, attracted users from other platforms or made wider use of the product possible. The first major tipping point happened when a popular FOSS blogging tool Movable Type changed it licensing from FOSS to proprietary model in 2004. This made the use of Movable Type expensive for many users, who ended up searching for a replacement to continue blogging without a charge. WordPress was one option and it had the possibility to import the existing contents from Movable Type blogs, so it was considered as a convenient shift.

Other tipping points have been the introduction of WordPress.com, which made using the software available for new user groups withouth technical skills. Also the adaptation of WordPress by mainstream media services such as Wall Street Journal, Fox News, CNN, and NY Times, accelerated the popularity of the software. Introduction of plugin platform, themes, pages and custom fields were also improving WordPress' functionality as a content management system and attracted new user groups. These changes also helped to create the initial ecosystem of consultants and extension developers to benefit from the product.

Originally, WordPress was built as a personal blogging software that tech savvy users could download and install themselves on their own servers. This enabled people to concentrate on building and customizing their blog based on a FOSS platform. WordPress got a lot of attention due to its excellence in ease of use and emphasis on user experience, and started spreading virally among the growing number of blogging enthusiasts.

> Mullenweg*: "[The success of WordPress] always seemed big in every point. 50-60 downloads per day in the beginning seemed quite a lot. Now it is 50-60 thousand downloads per day. It was pretty exciting and motivating. One of the best parts in being an open source developer. WordPress is spreading virally with people who are using it and are asked advice by friends building websites. It is cool, because it's free."*

Today, in 2013, WordPress is the leading content management system in the world. According to W3Tech's survey, WordPress is used by 17.5% of all the websites. It has a content management system market share of 54.7%, followed by Joomla at 8.5% and Drupal at 7.2%. (W3Tech 2013f). It is used by bloggers, website owners and media companies as a platform to share and manage content online.

Examples of WordPress use can be found on various popular websites. Artists and athletes such as Snoop Dogg, Usain Bolt, Katy Perry, Axl Smith, or Andy Roddick are using WordPress as a platform for their fan websites. Media companies such as BBC, Forbes, and Condé Nast use it for their blogs. Also big companies such as GE, SAP, Nokia, and Ford are taking advantage of WordPress as a publishing platform for their websites. (WordPress 2013e)

In the future, WordPress' targets are continuing to build the main platform for sharing content online, and attracting more new user groups.

> Mullenweg*: "My mission on building WordPress: broadly we want to build on our strengths such as ecosystem, 3rd party developers and platform aspects. Improving new user experience provides huge opportunities. Our mission is to focus on the next 500 million WordPress users. We develop the core and improve*

the software around solving those problems. Globalize and internationalize it. I use a lot of my time thinking about those problems."

4.2. The development community of WordPress

The development community of WordPress is organized based on meritocracy (Chesbrough 2007). This means that individual developers' status and power in the community is based on their contribution and devotion to the product. According to Mullenweg, there are currently five lead developers and about a dozen main contributors. In addition, each release has about 150-200 contributors, who produce a significant amount of new code and small changes in existing codebase. The evidence of community activity at the official WordPress website support this.

> Mullenweg*: "The leads serve as guides. A lot of contributors do it because it's fun. They have websites themselves, they use it at work and they just enjoy being involved. People who use it at business grow so fast they don't have the time to contribute. Hopefully they will in the future."*

Mullenweg also refers to a group of contributors as *opportunistic developers*. They usually fix small bugs or find something that does not work for them, so they are first and foremost solving their own problems but at the same time contribute to the community.

Also, there are tens of thousands of people developing plugins and themes. WordPress has a built in system called hooking, that enables to build plugin functions that affect the functionality of core software without making modifications to it. This way, plugins can hook in to the core user experience and still be pluggable and updatable.

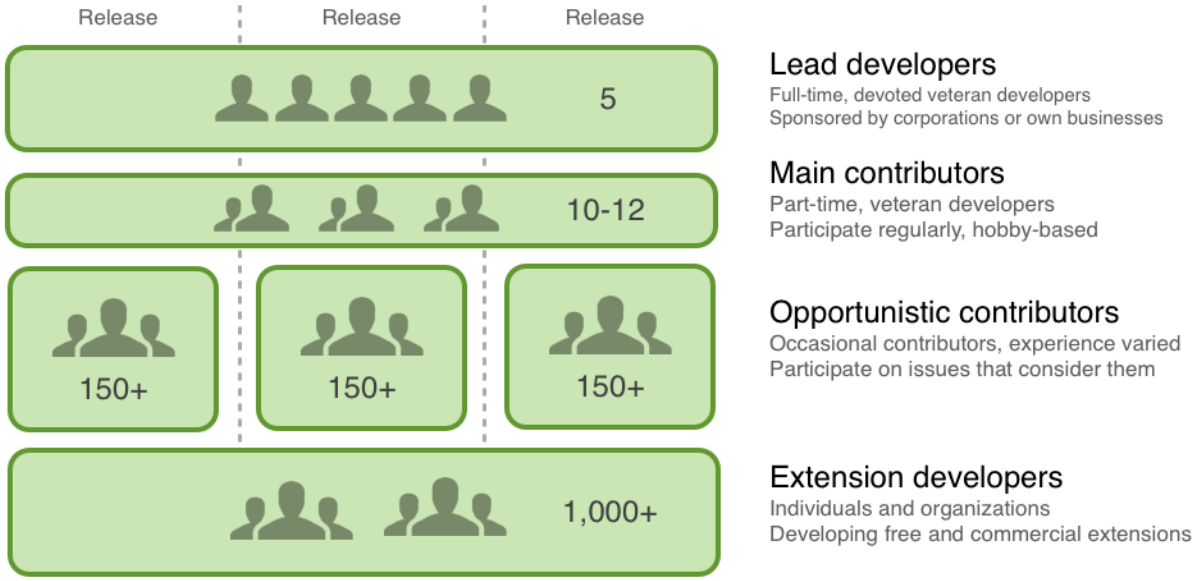

***Figure 4.1**: The organization of the WordPress development community.*

The development community is visualized in Figure 4.1. It demonstrates that the lead developers are involved in the development throughout releases, often working on the product full-time sponsored by corporations or their own businesses, or investing a considerate amount of their personal time to development. Main contributors are involved regularly along the way in most of the releases. Opportunistic contributors are involved only on occasional releases, and contribute to smaller issues that consider them. On the outskirts of the core community, there are thousands of extension developers that are not directly affected by the release cycle.

4.3. The development process of WordPress

The development process of WordPress practices the principles of FOSS development. As described in Figure 4.2., we can see that the development cycle is in align with that of outlined by Roets et al. (2007). The major difference is the use of a roadmap that is iterated all the time. Roadmap is divided into executable release plans. New features are voted and the development progress can be viewed in an open tracking tool, although the lead developers make the final decisions on what to include in the releases.

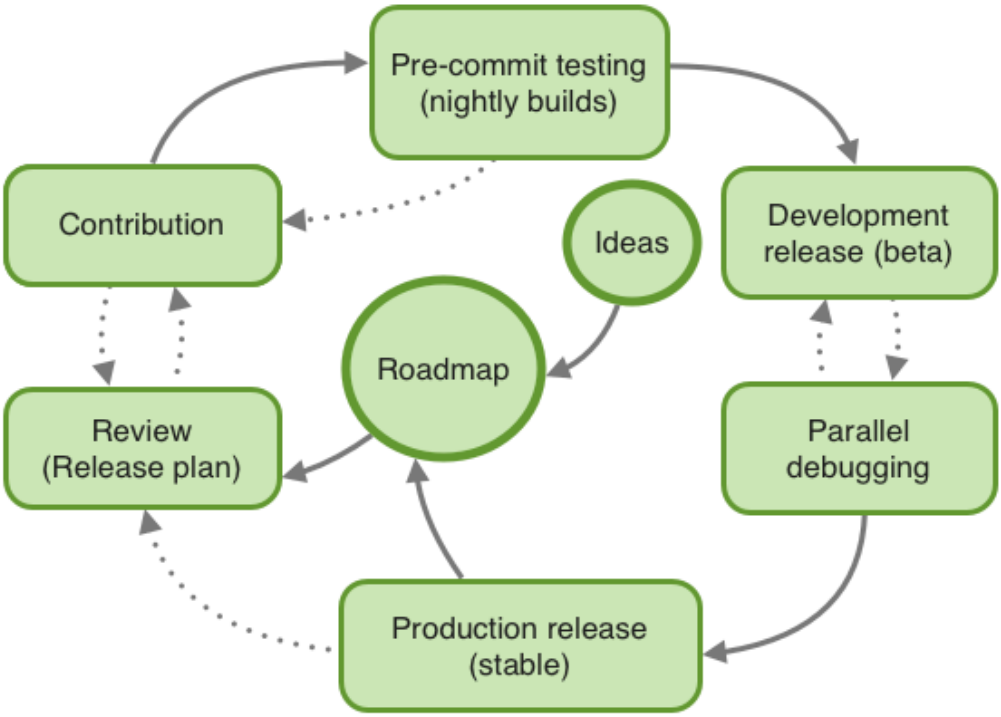

Figure 4.2: *WordPress development cycle (Adapted from Roets et al. 2007)*

The development is done always iteratively so that all development efforts are targeted to a release. The release cycle of WordPress has been an average of 2 per year. (WordPress 2013d) Mullenweg sees the release cycle as an important factor in competition against other open source content management systems. For example, Drupal releases new version in every one to two years.

The main artifacts of the development process are Ideas and Trac. Ideas is a service in the official WordPress website where anyone can post ideas of new product features to be implemented, and others can vote them. Trac is a service which tracks the actual development process and roadmap. It has a list of all the future product features, which are divided into releases. All the features in the roadmap are divided to sub-tasks, and the development progress of these features can be seen in the service. The features that will end up to the roadmap and the next release are decided by the lead developers.

> Mullenweg*: "About a week right after we publish a new release, we have a meeting where we discuss about where the product should go. We make a list of*

the features we'd like to include in the following version. I coordinate the list with one of the lead developers. We then agree on a roadmap which tells where the product is going, and start executing it. Three to six months is an ideal time for executing the list, and then we'll start over."

The selected features are prioritized by a balance of factors that affect the end users' experience. Mullenweg says that they always think first about the needs of their users: consultants, professional bloggers and regular users.

Mullenweg*: "It's very important to make it relevant and useful for regular people. The 3rd party developers will find their way.*"

One driving factor behind the development decisions is something in which Mullenweg refers to as virtuous loop and desire paths. This means that the core WordPress developers are creating a platform for various possible applications in plugins and themes. After release they follow how those features are used, and improve the feature set to answer to arising needs.

Mullenweg*: "There is a story of this university that didn't have any pavements ready but instead had a plain grass field and where the people started walking and made paths, they paved it. Plugins and themes are the manifestation of desire paths in WordPress. We looked at them to see what's going on. We created an API to make those things possible with JSON in plugins and themes. The authors took these features and used them in ways we even couldn't imagine. As we found out how people started using it, we add more features that let people do more things. This virtuous loop has driven a lot of innovation in the development of WordPress."*

4.4. WordPress as a product

WordPress is a publishing platform which is used to manage contents of a website. It enables people with limited technical skills to publish, update and remove content, and control the overall appearance and functionality of the website, without having to interact with

programming code or markup language that is used to build and present the website. In this chapter, I will describe the structure of the product and its modular structure in more detail.

4.4.1. The product structure

To fully understand and describe the product structure, I downloaded WordPress version 3.5.1 from the official website (WordPress 2013a), and installed it on a compatible shared web server. The installation process takes a couple of minutes, and requires no encounters with code. After unzipping the downloaded package and uploading the files to the server, I went to the address that accesses the folder I uploaded the files to. Installation process asked the database name, username, password and database server address. After filing them, the installation program asked to name the blog and create the username and password for the administrator. After this, the program ran installation and I was able to login to the control panel and see the actual website with default settings.

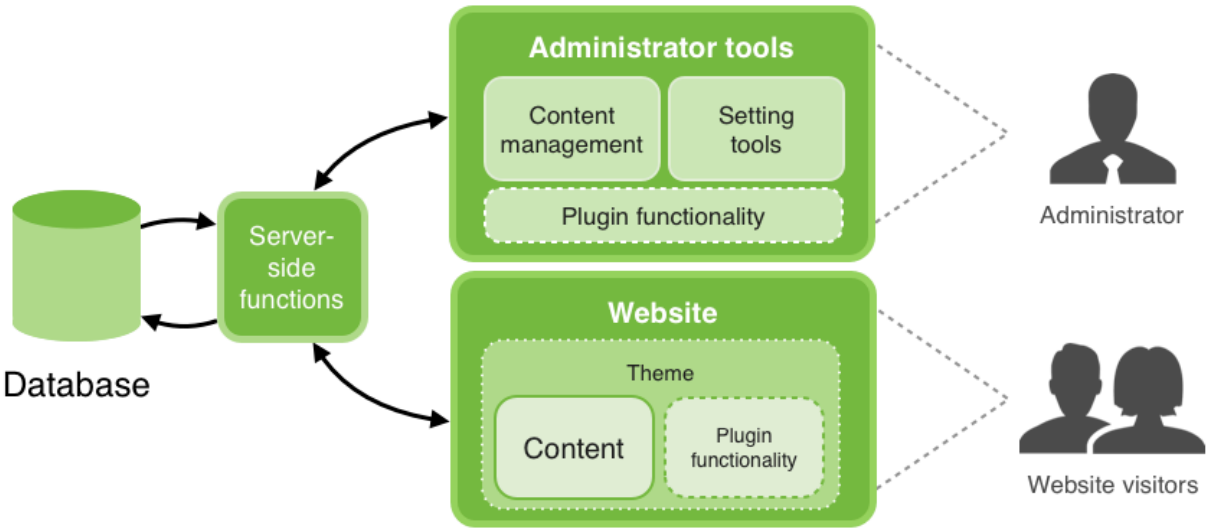

***Figure 4.3**: The structure of WordPress visualized. The users of the software are the administrators and the website visitors.*

The structure of WordPress product is described in Figure 4.3. WordPress can be divided to two distinct user interfaces: administrator tools and the website. The administrators manage and control the settings, content, functionality, and appearance of the website. The appearance and functionality of the website are controlled through the theme and plugins, which are

activated by the administrator. Then, the website visitors can access the website, and read the content which is displayed in the form defined by the theme.

The server side functions handle the requests made by the administrator or website visitor, and interact with the database. For example an administrator uses the content management tool to create a new blog post, and WordPress's server side functions update it to the database. Then the website owner goes to the website, and sees the content received from the database. The content is then displayed in the format defined by the theme.

4.4.2. The LAMP environment

WordPress is designed to be installed on top of the LAMP environment, abbreviated from the combination of Linux operating system, Apache web server, MySQL databases, and PHP programming language. All of the LAMP environment's technologies are FOSS, so it is a common platform to create open source web software.

Every third of all web sites are running on Linux (W3Techs 2013b). Apache server's market share is 62.6% (W3Techs 2013d) and PHP is the most popular server side programming language, used by 78.8% of all websites globally (W3Techs 2013c). According to Evans Data Corporation's study, MySQL has a market share of 25% of all database market. (MySQL 2008) This demonstrates that the LAMP stack compatibility is a fruitful platform for WordPress's growth as a FOSS product.

4.4.3. Modular structure of WordPress

WordPress is modular product, which means that the core product can be complemented with variety of extensions, called plugins and themes. Plugins offer custom functionality, extended features, and integrations to other products or services. Themes, on the other hand, control the appearance and functionality of the website.

As Allen (2012) has stated, extensions are a way of taking advantage of the modular design to make user contributions more accessible than attempts to contribute directly to the code base.

Various plugins and themes have been downloaded over 200 million times from the WordPress official website (WordPress 2013a).

Based on Langlois and Garzarelli's (2008) design rules, we can identify three building blocks of the modularity in WordPress. By *architecture*, it has been defined that plugins and themes are supplementing the use of WordPress and provide enough possibilities to add extra functionality and control the use of the system. *Interfaces* are offered, as both plugins and themes have their own application programming interfaces, and administration tools. There are also *standards* that have to be met in order for the extensions to work with the system and be able to administrate.

4.5. The Business Ecosystem of WordPress

According to research on business ecosystems (Moore 1996; Iansiti & Levien 2004; Androutsellis-Theotokis 2010), varying roles can be found that construct the ecosystem. I will be introducing the keystone company of WordPress development, Automattic, and other roles such as niche players, and the customers.

4.5.1. Automattic as the keystone company

A company called Automattic was founded by some of the original lead developers of WordPress to monetize some of the additional value services to support WordPress. The company was founded in 2005, and according to startup funding database CrunchBase (Web: CrunchBase – Automattic) it has raised two rounds of funding, a total of $30.6M. The lead developer Matt Mullenweg is also the founder and president of the company.

Automattic is specialized in the freemium business model, and lists 12 products in their website (Automattic 2013). The most popular products of the company are WordPress.com and Akismet. WordPress.com offers WordPress blogging tool as a hosted service, targeted to users who don't want to own or lease a server to have a blog. According to web analytics company Alexa (Alexa 2013), it is the 21st most popular website in the world measured by traffic and about 4% of the global internet users visit the blogs hosted by the service daily.

Akismet is a tool to prevent spam commenting in blogs, distributed as a WordPress plugin. It answers to a common problem among bloggers, that automated spam advertisement bots are heavily taking use of the open commenting of blogs, which is supposed to encourage users to give feedback without registration. Akismet has developed an algorithm and black lists to detect the spam comments automatically, thus saving time and nerves of the bloggers and moderators. The basic plugin is free and is a default plugin in WordPress installations, but it has premium features for blogs with larger audiences.

Mullenweg categorizes Automattic's income streams in three classes:

1. Upgrades on WordPress.com, such as custom domain names and premium features
2. Premium services for self hosting, i.e. Akismet, Polldaddy, and VaultPress backups
3. Hosted premium services such as Jetpack, and WordPress.com VIP

The company has currently about 140 employees (Web: CrunchBase – Automattic). According to Mullenweg, most of the company's employees are distributed around the world. About two thirds of the people are living in the US and one third elsewhere. Ten people live and work in the San Francisco Bay area in California, where the company is headquartered.

> Mullenweg*: "We try to hire the best people in the world, wherever they are. All the recruiting is inbound. People visit our site, like what we do and apply to work for us. We have a lot of easter eggs in our site (clickable items and hints in unexpected places) that lead to our jobs page. So we want to have people who are interested and playful enough."*

Even as president of a growing global company, Mullenweg is the lead developer of WordPress, and he sees open source contributing to the development of WordPress as a vital part of the company's success. That is why many of the company's full-time employees are also contributing to open source as their main duties at work.

> Mullenweg*: I think Automattic is one of the largest users of the software at the moment. It just behooves us to contribute to the software from the end-user point of view. All of Automattic's core products are built on WP, especially*

Wordpress.com is built on WP, so... So by nature, we contribute by building the software we are using. We employ people who contribute to it full time. The vast majority of our people are contributing for WordPress.

Mullenweg also thinks that more businesses using WordPress will eventually be contributing to the development of the core product in the future.

Mullenweg*: We are serving as a catalyst, by setting a good example. Contributing, and encouraging people to do the same. A lot of businesses use WordPress. Over time, they should contribute as Automattic is.*

Automattic has been also an active acquirer in the field of blogging services and tools. It has acquired for example the universal blog commenter avatar image service Gravatar (10/2007), a tool for creating website opinion polls called PollDadddy (10/2008), a social network platform built on top of WordPress, the Buddypress (3/2008), and most recently a content syncing tool between different devices called Simperium (1/2013). The company has also made investments in companies that have distinct business models in the WordPress ecosystem. (Web: CrunchBase – Automattic)

4.5.2. Other roles in the business ecosystem

According to a survey replied by over 18,000 WordPress website visitors in 2011, there is a significant amount of people who are making a living or running a business based on the use of WordPress as one of the main resources (WordPress 2011). From the results of the survey, five distinct business actors can be found. The actors and their customer relationships in the WordPress business ecosystem are represented in Figure 4.4.

End users are the actual users of the software. Most of them are private users or businesses using the software as a free alternative to commercial content management systems, to maintain their web presence, and not providing significant added value to the business activities. The businesses that rely on using the open source product as its key resource is also a business actor that literature does not seem to take into account as a business model in FOSS ecosystems. Such companies in the case of WordPress are media companies that are

using the product as their publishing platform, therefore relying a big part of their competitiveness on using FOSS as a resource, and generating revenue by selling advertising or premium content.

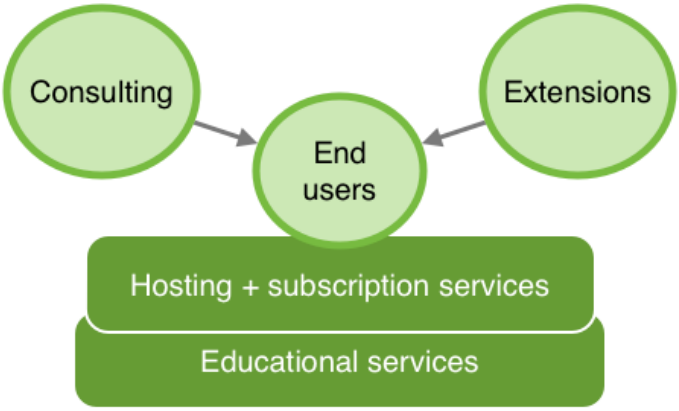

***Figure 4.4**: The actors of WordPress business ecosystem and their relationships.*

Educational businesses are in the benefit of all the actors and also help to build the ecosystem. These businesses include writing and publishing educational books, organizing WordPress related education, or maintaining websites that help WordPress developers.

Hosting and subscription services provide the infrastructure for the end-users. They are offering web server hosting, technical maintenance services, or a complete service platform for building and maintaining WordPress websites, such as WordPress.com.

Consulting has the biggest share of actors in the ecosystem, even though they are small in size. Consulting companies install the software, offer design services, and build custom websites for individual people, companies, or organizations. They use WordPress along the the resources and tools available to build a custom solution for their client, and have the technical knowledge to make modification to existing solutions.

Extensions consist the group of actors developing plugins, themes, or premium services, and distributing them. This group is also in the interest of my research, and I will be studying this part of the ecosystem in more detail, and clarify the business models enabled by it.

4.6. Conclusions on WordPress

In the case description, I have tried to explain WordPress so that it is possible to understand it as a platform for business. I started with detailing the history of WordPress as a blogging tool, originally developed to be a better solution for personal needs. I also tried to underline its current significance as the most popular publishing platform in the world, used by millions of individuals and organizations.

WordPress is a publishing platform that enables the management of a website's contents, appearance and functionalities. The development of WordPress is based on a meritocratic organization, lead by developers who have contributed to the project over a long period. The roles in the community are lead developers, main contributors, opportunistic contributors, and extension developers. The development process of WordPress follows a general FOSS development cycle, organized around releases which are iterated together with the community on an open project tracking platform. I explained the structure of the product through the user roles. The product is modular by architecture, supporting two kind of extensions: themes and plugins.

There is also a viable business ecosystem that has emerged around WordPress. Based on a survey from the community, several roles could be identified alongside the end-users. Consulting companies are helping the end-users to meet with their requirements for their websites, educational companies provide learning material and environments to use the product, and hosting and subscription services offer a required platform to publish websites.

Extension developers are also an important actor in the ecosystem. As they are the interest of this study, I will next analyze their business models. To narrow down the research, I have chosen to examine the theme extension providers, and find patterns in their business models.

5. Business model analysis

After understanding both WordPress, and the community and ecosystem around it a bit better, I may move on into the business models of the extension actors. In this chapter I will demonstrate the data collected on WordPress theme developers, and analyze it. First, I am going to introduce the data and do an overall analysis of the companies. Then I will move on to analyze the business model building blocks one by one based on the collected data. After that, a pattern matching analysis will be done to find business model patterns inside the ecosystem.

5.1. Introduction to the companies

The analysis is based on a total of 64 companies which are offering WordPress theme extensions. The companies and their basic information is listed in Appendix 2. Only 53,1% of the companies declared their employee count, but the general observation was that most companies are either micro or small in size. The average employee count was 5.53, with a median at 2.50. Only five of the companies had over 10 employees, and the biggest one had a total of 30 employees.

The country of origin was available in 40.6% or 26 of the websites. 13 of these companies had operations in USA, but notably 9 of the companies had people working in several locations. Companies were based all around the world, including Indonesia, Malaysia, Nepal, Moldova, Canada, UK, Malaga, Sweden, Germany and Holland.

It can be seen that these companies are working on a global market, selling digital goods and services. The origin of the company does not matter, since majority of the companies didn't even share that information. All of the companies that shared their employee count, also had pictures and names of them on their websites, and many of the smaller firms shared some short biographies or descriptions of those people. This sets a clear division between companies that don't share anything about their backgrounds to those that try to create a more personal brand.

5.2. Analyzing the business models

To understand the business models of the 64 companies in more detail, I will analyze them using the business model canvas and its building blocks. In the following chapters I will analyze the evidence on value propositions, customer groups, customer relationships, channels and revenue channels. Also, I will be making some observations about the efficiency building blocks, representing the internal constructions of the businesses.

5.2.1. Value propositions

To analyze the value propositions in a more constructed way, I will first analyze the companies' products as part of the value proposition, and after that the services that the companies are offering.

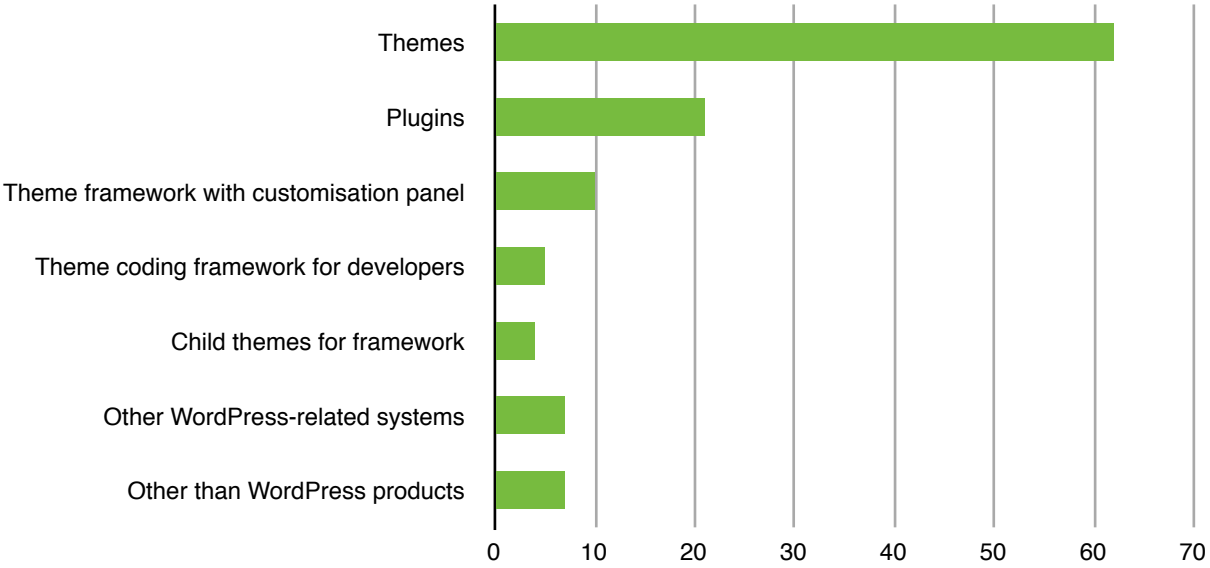

***Figure 5.1**: Product offering of the companies. Number of occurrences (n=64).*

As could be expected from a list of theme developers, *themes* were the most common product, as 96.9% of the companies offered them. The only two that did not offer themes were focused solely on providing theme development frameworks, that other themes could be built on. Complete statistics of product offering can be seen in Figure 5.1.

One third of the observed companies offered also *plugins*, either free or premium, as part of their product portfolio. Many of these companies actually used a model in which they offered plugins for free, but they worked only with the themes they were selling.

Theme frameworks are using the theme interface of WordPress, but are built to be a platform for creating various kinds of themes. They have built-in functionality that makes it easier to create different variations, easily move elements or develop different kind of extra functionality on the theme. Ten of the companies offered this kind of framework which had a customization panel for the website administrators, so website owners could modify the appearance of their website without any knowledge of code. Five companies had built a framework specifically for developers so consulting companies could speed up new theme creation process by using a platform that has supportive functionality already built in. Also, four companies offered child themes which are themes that work only on the specific framework.

StudioPress is one of the biggest companies of the study. They have a staff of 30 people and report to have over 86,000 customers. The company's offering is based on their Genesis framework, and all of their themes are child themes for this framework. The child themes can be bought separately or as a one-time lifetime payment to access to all of the themes. Working with a framework reduces the time for a developer to customize a website for their client's needs. The lifetime access to all themes allows developers to offer the themes to their customers, and work with a framework they know. This is probably the logic why StudioPress offers niche themes for a wide variety of industries.

Seven companies had products that didn’t fit the other categories. Also, seven of the companies offered other than WordPress products on their websites. For example AppThemes offer themes that turn WordPress blogs into applications such as classified or job listing websites, coupon services, business directories or issue tracking services. As another example, WooThemes has a platform called WooCommerce which turns WordPress into a web store. The platform has a lot of features which compete agains other e-commerce platforms, such as product catalogues, online payments, order handling and search tools. The tool uses WordPress's core to handle the management of the system.

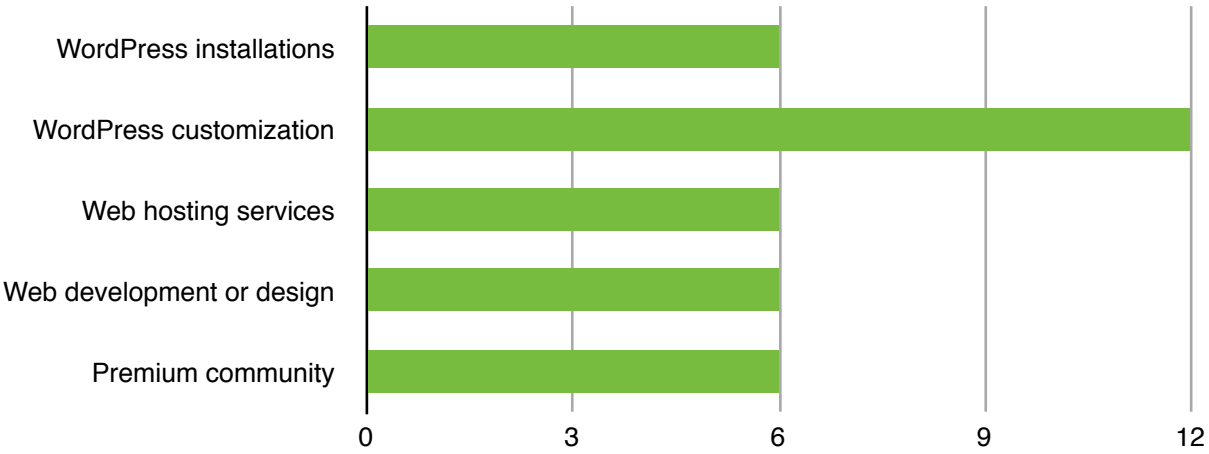

***Figure 5.2**: Services offering of the companies. Number of occurrences (n=64).*

A rather small share of the companies were willing to offer services. Many of them even explicitly stated they do not offer services related to their themes, and had a list of consulting partners. It is important to note that these value propositions don't take customer support services related to the products into account, but focus on added value and customization services. A complete list of services offering can be seen in Figure 5.2.

Although, six companies offered WordPress installation service, 12 companies were willing to do customizations, and six were also offering web development or design services not related to WordPress. Six companies offered web hosting services for blogs and websites. Another six companies also charged for some kind of premium community or full access to support forums.

As an example, ThemeFuse is heavily promoting a package pricing on top of their website. They offer a theme, hosting and a web domain registration on a package price, and without an installation fee. This is probably targeted towards people who don't already have a hosting solution, and might generate a steady cash flow for the company.

5.2.2. Customer segments

Customer segments were collected from the companies based on their offering, direct statements on the website and categorization of products. As the customer segments of theme developers, five different customer segments can be identified: consultants, personal bloggers, media sites, website owners and niche businesses.

Consultants as a customer segment consist people or companies that are buying themes mainly for their customers, installing them, and customizing them based on customers' needs. The distinctive offerings for consultants include for example license to use themes in several projects, original layout files for customization, or built-in abilities to modify theme's functionality with short codes. 19 companies (29.7%) had consultants as one of their customer segments. In most cases, consultants are referred to as developers in the theme developers' marketing.

Personal bloggers can be defined as individual people, families, or non-organized groups that want to publish a blog. They might or might not have technical skills, but their need is based on making their own blog distinctive and have a personal feeling. Theme developers have targeted them with simple to use blog themes that are suitable for publishing in a regular manner. 48.4% of the companies targeted this customer segment.

Media sites are companies or organizations that have a need to publish articles, news, or columns from many authors. These websites might be commercialized with advertising or paid content, or they can be publishing some interest groups' writings. In many cases, these themes are categorized as Magazines and they have a distinct appearance from regular blogs with a layout that resemble news websites. 19 companies (29.7%) offered theme solutions also for publishers.

Website owners can be individuals, organizations, or companies that need a website which can be updated on a web browser. In most cases, they rely on a structured website that can have several static pages and a news section. According to WordPress lead developer Matt Mullenweg, WordPress is mostly used as a content managing system for web sites, instead of a blogging tool. This fact explains that website owners are the most desirable target customer segment for theme developers, as 73.4% of the companies offered themes for them.

While themes for website owners are usually rather general and can suit any kind of industry, the *niche businesses* are served with industry-specific targeting, such as themes for restaurant, real-estate agents, or fitness professionals. These themes include images, special functionalities or templates for specific kind of content. 45.3% of theme developers had targeted some specific niche businesses in their offerings.

For example, WP Casa offers themes only for real estate agencies. They have built themes that enable building websites where visitors can search, browse and contact the agents. A lot of features specifically related to real estate business have been built, such as agent profiles, property details, map integration, or a search based on apartment features. PressCoders has themes mainly for personal trainers, gyms and other fitness professionals. The theme has built-in features such as appointment scheduling, online payments and private members area. They also offer hosting for fitness websites on their FitProSites service, that is built based on WordPress.

5.2.3. Revenue streams

The evidence of revenue streams revealed an interesting spread of different pricing models. Common with the companies is that all of them had automatized sales, meaning that the purchasing process and payments were offered on a direct web interface without any contact with sales people or customer service. Only the companies offering customizing services had a process to contact the sales before making payments.

The complete statistics of revenue streams can be seen in the Figure 5.3. The most common revenue stream for the companies is one-time payments, in which the customer selects themes that they want to buy, pay them, and get to download the theme files. 59 or 92% of the companies offered one-time payments.

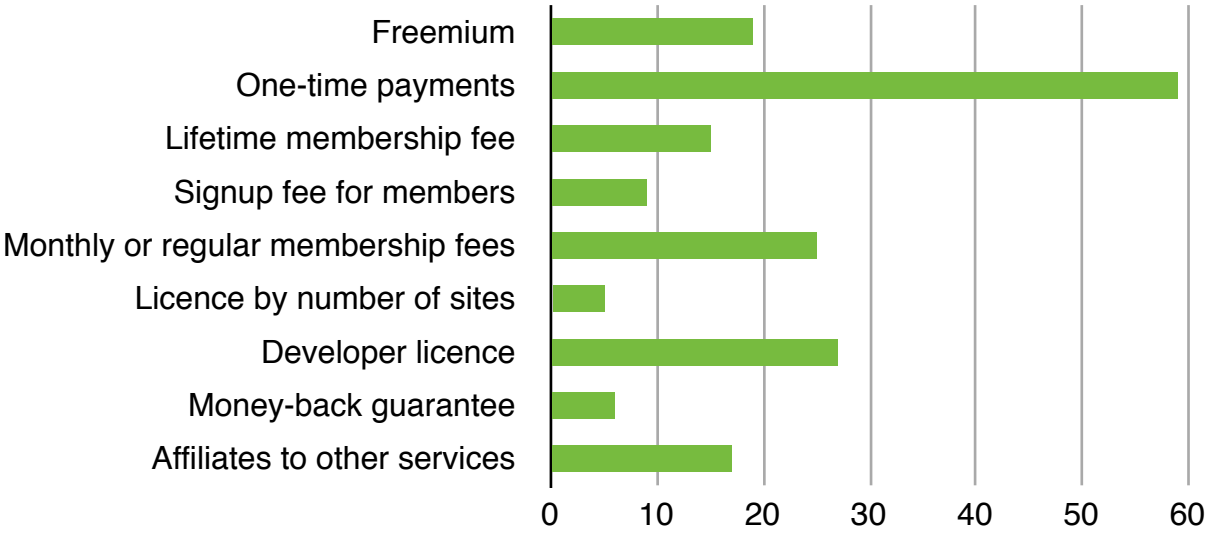

***Figure 5.3**: Revenue streams of the companies. Number of occurrences (n=64).*

Another popular revenue stream is a membership program which is offered in some form by 53% of the companies. Membership programs are monthly or annual subscriptions that grant limitless access to a pool of resources. In most cases, they included for example the availability to use any of the current and future themes, access to premium support forums, or developer features. 44% of membership companies offered one-time lifetime membership fee, 74% had regular membership fee, and 27% combined regular fees with an extra signup fee.

For example, Elegant Themes has over 80 themes and reports to have over 175,000 customers. The company does not offer one-time purchases of themes, but an affordable club membership at the lowest price level compared to other clubs. The membership grants access to all of their themes. There are three level plans of memberships: annual basic plan, annual developer plan with access to plugins and other resources, and a lifetime developer plan that offers a one-time payment access with the equal price of three years' annual developer plan. Most probable customer for them is a consultant that wants access to a pool of themes to offer to their customers' websites. Most of the themes are for website owners.

30% of the companies had a freemium model, and offered free themes or plugins, or some form of free version to use a theme without support or extra features. Six companies (9%) also offered a money-back guarantee (14 to 30 days) if the purchased themes were not satisfactory.

Developer license includes tools and licenses useful for consultants with many clients, or a need to customize the themes. 27 companies (42%) offered some form of developer licenses for one-time purchases or developer memberships. Also, five companies had a distinct policy for selling multi-site licenses.

One source of income for theme developers also seemed to be directing traffic to other companies that provide complementary services such as web hosting, and getting a share of their revenues. These affiliate links appeared on 27% of the companies' websites.

5.2.4. Customer relationships

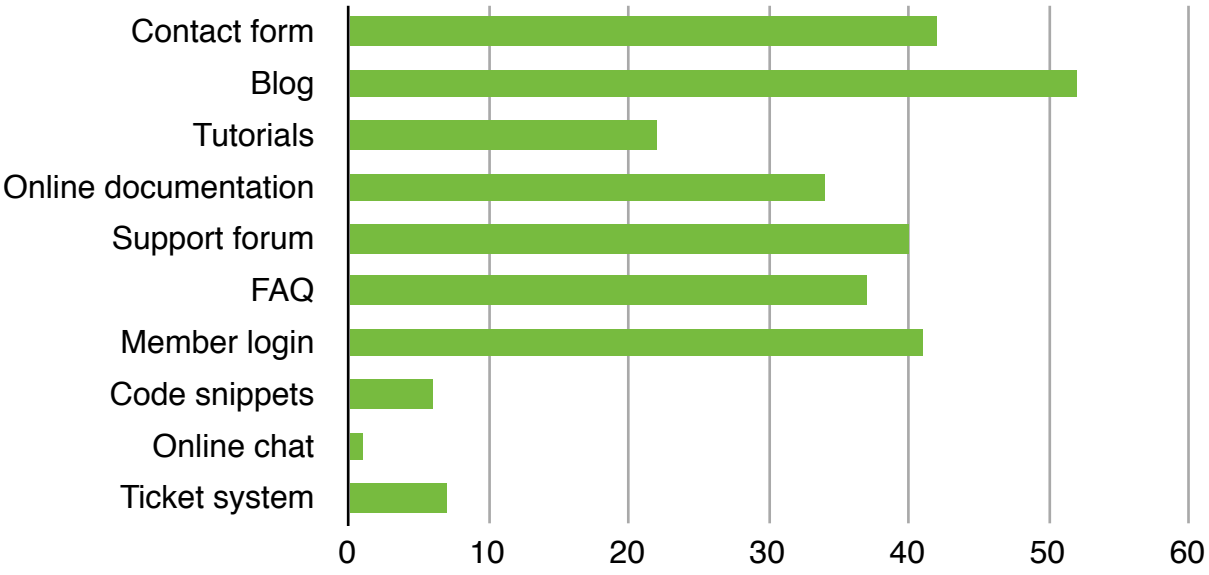

***Figure 5.4**: Customer relationships of the companies. Number of occurrences (n=64).*

Figure 5.4 demonstrates the different means that the companies use to manage their customer relationships, based on their occurrence on the websites of the companies. All of the companies relied on a web based customer relationships, as a customer service phone number was not available on any of the subjects. Also, only one company had an online chat, so immediate problem solving directly with a customer service rep is not offered on the theme developers business model.

The most common way to serve customers was a blog, which usually is used for communicating on new product releases, updates, and other product related information. Member login was also popular, mostly driven by the membership fee based companies. The members area is in most cases meant for managing subscription details and accessing restricted support features. Contact form or a special ticket system was available on most of the websites.

Online documentation of the products, FAQ or frequently asked questions, tutorials and support forums were also present on many websites – usually complementing each others. A handful of companies offered prewritten code snippets that help consultants modify the products by themselves to suit different needs. These companies were without exception offering their products to consultants.

5.2.5. Channels

Channels proved to be difficult to research, since the evidence was collected only from the company websites. Therefore, for example advertisements, referrals or appearances in different directories were difficult to prove. Active PR was apparent only for one company that quoted the articles about its services.

Obviously, the common channel for all the companies was the source where they were found, WordPress official website's list of commercial theme developers. Three companies declared they are offering WordPress.com themes, but the statistic cannot be taken as accurate since they were not checked within WordPress.com and the WordPress.com theme directory had insufficient search capabilities based on companies.

Newsletter was available on 28.1% of the subjects, and other observations were made on even larger spread of social media channels used, such as Facebook page or Twitter account. 34.4% of companies had customer testimonials or recommendations from their users. A surprising finding was that nearly 60% of the companies had an affiliate program which offers a fair share of the sales price, usually 20-30% per a referred customer.

Even though the analysis of channels proved difficult and insufficient, it can be said that affiliate programs are a significant channel for the companies, among directing traffic with advertising, returning customers from blog, newsletters and social media, or presence in theme directories.

5.2.6. The efficiency building blocks

The evidence was collected only from the public information generated for marketing purposes by the companies themselves. This is why collecting clear and non-biased data about the internal building blocks, such as key assets, key activities, key partnerships, or cost structure, proved difficult. Only observations on the publicly demonstrated issues could have been done, such as number of themes and plugins, distinctive partnerships with third party companies, or other resources.

A clear distinction can be drawn between those with a big number of themes in their offering and those with small numbers. In many cases, the membership revenue model was supported by a large pool of themes, counted in 50-100. The smaller catalogues consisted usually of less than 10 themes. Another key asset can be defined on those companies offering customizing services or competed on customer service, since they usually had a highly specialized staff. On the other hand, the number of observations was too low to make any further conclusions.

Cautious assumptions of key activities and cost structure can be made based on the offering, channels and customer relationships. It can be said that theme development is one of the common main activities, followed by customer support related activities. Deductively, development is labour intensive and most expenses relate to work force.

5.3. Conclusions from the business model analysis

In the business model analysis, I have collected evidence on 64 companies that offer WordPress theme extensions. I collected the data from their websites and focused mainly on the value creation building blocks. Altogether, the companies are regularly small and employ

only a few people, in many cases spread around the globe. The businesses work nearly entirely in digital world, not paying much attention to their origin.

The offering of the studied companies consists mostly on digital products, and only few offer services. The extension providers serve five distinctive customer groups: personal bloggers, website owners, niche businesses, consultants, and media sites. There is a wide variety of revenue streams, but they can be categorized in two classes: one-time payments with several levels of licenses, and membership programs. The evidence shows a heavy emphasis on automized and community-driven customer relationships. This includes the use of online documentation, support forums, tutorials, and blogs. Against expectations, the evidence collection on channels was difficult due to the source of data, which only represented the target of the channels probably used. Some careful assumptions on the key activities, resources, and partnerships could be done based on the value propositions, but they were not the main focus of this research.

These findings offer a good understanding on the businesses of the extension providers in general level. Together with the case study database, they provide a good platform for business model pattern analysis. In the next chapter, I will demonstrate the pattern matching which was done on the evidence after the initial analysis.

6. Business model patterns

Based on the business model analysis and its findings, I have made a pattern analysis of the business models of WordPress theme extensions providers. This analysis should provide an understanding of the business models which exist in FOSS extension ecosystems. In this chapter, I will demonstrate the findings of the pattern analysis and put them into context. Before that, the basis of the pattern analysis is explained.

6.1. Matching patterns

While making the research, I started noticing patterns in the business models of the WordPress theme extension developers. There are similar features that could be noted and firms that can be easily comparable, while as some businesses are not even competing the others with their distinctive offering. I noticed that the most differences occur between the relationships of the target customers, value propositions and revenue streams. Some businesses clearly have two or even three business models in use, but this is usually in cases in which they serve several customer groups based on the shared key assets.

The first clear business model pattern found when I was looking at the value propositions and revenue streams that were targeted to personal bloggers and website owners. These companies offer one-time purchases from a large selection of themes for them. Another business model pattern was obvious when I observed the companies that targeted consultants. Their value proposition is based on either a large selection of themes or a development framework, and they offer a membership to access all the resources. In many cases, these two business models are combined and use the same key resources. In contrary, there also exists companies that target only consultants with their offering while the business model has the same revenue model and value proposition.

The third business model patter found when I was inspecting the companies which targeted niche businesses. Their solutions are highly specialized, and have less selection in their offering. The products are also priced higher than those offered generally to website owners. Also distinctively to the first pattern, these companies are willing to offer services related to

their products. Yet, the fourth business model pattern was based widely on personal service. They clearly targeted also to serve very special customer needs with customized services for extension development.

All in all, I have found four distinctive business model patterns that exist in the ecosystem, and novel to the literature: Publishers, Clubs, Turnkeys, and Boutiques. Publishers sell licenses for extensions, while Clubs provide themes, development tools and resources for Consulting companies. Turnkeys provide ready-made extension solutions and related services for niche customers, and Boutiques develop extensions based on individual customer needs. I will describe these patterns in the following chapters, put them in the context of the ecosystem, and compare the findings with the literature. The complete list of companies and their matched business model patterns can be seen in Appendix 2.

6.2. Publishers

Publishers are the department stores of extensions. They offer a great variety of themes and plugins for various kinds of needs, and try their best to be a one-stop shop for WordPress users in need of a value adding extension. In total, there were 48 companies that applied the Publisher business model, representing 75% of the companies. The Publisher model is in many cases combined with other models. 41% of Publishers are also applying the Club business model. Two companies combines Publisher model with Turnkey and three with Boutique model.

They serve three kinds of customers: personal bloggers, website owners and consulting companies. Personal bloggers value the large selection of high-quality themes that make their blog look good and distinctive from others. Website owners will also find a selection of themes and plugins that satisfy the requirements for their web presence. In the combination with the Club model, Consulting companies value the discounted selection they can offer to their clients and a development framework that they are used to work with.

Publishers' margin costs of sales are close to zero, so they have to add a lot of customers. The revenue comes from one-time purchases of personal bloggers and website owners, and

developer licenses or access everything memberships from Consulting companies. Publishers might have free themes or plugins that also work as a marketing channel. Since many of their customers will need hosting services, they are also recommending hosting services through affiliate programs, which give them a share of the referred purchases.

<table>
<tr><td rowspan="2">Key Partnerships</td><td>Key Activities

Theme development or acquisition

Generate traffic to the website</td><td rowspan="2">Value Propositions

Large selection of extensions</td><td>Customer Relationships

As automated customer service as possible: FAQ, tutorials, forums, online docs</td><td rowspan="2">Customer Segments

Personal bloggers and website owners</td></tr>
<tr><td>Key Resources

Large pool of themes in many niches or categories

Theme framework</td><td>Channels

Affiliate program

Theme listings</td></tr>
<tr><td colspan="3">Cost Structure

Development and customer service</td><td colspan="2">Revenue Streams

One-time purchases
Dual or multi-licensing</td></tr>
</table>

Figure 6.1*: The business model canvas of a Publisher*

The customer service of a Publisher is highly automized, with clear documentation for each extension, online forums, tutorials and FAQs. They require a lot of traffic to generate business, so channels used to reach customers include advertising, search engine optimization and affiliate programs.

Key resources of Publisher include the large selection (over 50) of themes and a brand awareness that generates traffic to the website. All of the biggest Publishers also have their

own theme framework that helps to both develop new themes but also maintain Consulting companies loyal to the Publisher. Key activities include developing or acquiring new themes and generating traffic to the website. Because the business model is based on automized customer service, most of the Publishers have partnered up with Consulting companies they recommend to offer customizing services to their themes. The business model canvas of a Publisher is described in Figure 6.1.

As an example, WooThemes combines the business models of Publisher into Club and Turnkey. It has a selection of 75 themes and six plugins. The themes are categorized under apps, business websites, online magazines, multimedia sites, personal blogs, portfolio websites for photographers or designers, responsive websites, and e-commerce. A single theme costs $70 and includes 2 bonus themes. They also offer developer licenses with premium features and a membership subscription to access all themes. The customer support is highly automatized, including online documentation, video tutorials, FAQs and community forums. They also offer a distinctive Turnkey solution for web stores, called WooCommerce. The solution is a development framework, and the company sells also themes and plugins developed only to be used with it.

6.3. Turnkeys

Turnkeys are very selective on their clients. They serve a niche industry or business, and offer a complete solution for specific web presence needs. Turnkeys' customer relationships are driven with premium personal service, that is able to help on implementing the solution. The revenues come from one-time purchases or annual fees to access premium services. Customers find the solutions through Turnkey's own affiliate program, advertising in niche media, or search engine optimization. The complete business model canvas is described in Figure 6.2.

In total, 9 companies applied the Turnkey business model (n=64). As an example, AppThemes offers complete business solution themes for job listing sites, coupon sites, quality control services, and business directories. The solutions include the layouts, administration tools,

payment systems, and all the supporting processes required to run the business for $99 each, or with AppTheme Club developer license for $349 signup and $79 annual fee.

<table>
<tr><td rowspan="2">Key Partnerships</td><td>Key Activities

Development

Customer service</td><td rowspan="2">Value Propositions

Complete solution for a niche industry web presence needs</td><td>Customer Relationships

Premium personal customer service

Documentation</td><td rowspan="2">Customer Segments

Niche businesses with industry specific needs</td></tr>
<tr><td>Key Resources</td><td>Channels

Affiliate program</td></tr>
<tr><td colspan="2">Cost Structure

Development and customer service</td><td colspan="3">Revenue Streams

One time purchases
Annual fees for premium service</td></tr>
</table>

***Figure 6.2**: The business model canvas of a Turnkey*

As another example, HermesThemes offers WordPress themes for hotels. They have five designs suitable for different kinds of hotels. The solutions include photo galleries, features for room displays, and testimonials management. All of the themes cost $199 each, and include theme installation and personal customer service, including an expert that is available to talk about the best-practices used by other customers.

6.4. Clubs

Clubs are members only companies that provide tools and resources for WordPress Consulting companies. Their offering might include development frameworks, themes, plugins, premium community, code libraries, or learning materials. This offering is so technical in nature, thus not even suitable for a regular end-user of WordPress. The clubs are based on subscription fees, and sometimes offer a lifetime fee that equals around three to four

years' subscription fee. The complete business model canvas of a Club is described in Figure 6.3.

<table>
<tr><td rowspan="2">Key Partnerships</td><td>Key Activities</td><td rowspan="2">Value Propositions

Tools for WordPress development

Improved efficiency

Better offering for end-customers</td><td>Customer Relationships

Good amount of resources

Code snippets

Online community</td><td rowspan="2">Customer Segments

Consulting companies</td></tr>
<tr><td>Key Resources

Theme development framework or a set of other resources</td><td>Channels

Affiliate program</td></tr>
<tr><td colspan="2">Cost Structure</td><td colspan="3">Revenue Streams

Membership program</td></tr>
</table>

***Figure 6.3**: The business model canvas of a Club*

Clubs were the second most popular business model among the sample. 29 companies (n=64) applied this model, out of which 20 combined it with the Publisher model. As an example, iThemes offers a package called *The WordPress Designer's Toolkit* that includes 180 themes, a development framework, 20 plugins, and 500 hours of video training. The package costs $590 for a year. This kind of a set would enable a Consulting company to access a wide variety of themes, premium features through plugins and learn to improve their customizing capabilities through the video trainings. This gives a set of tools for learning and offers a wide selection of ready solutions for the customers of a Consulting company.

6.5. Boutiques

Boutiques are service companies that work directly with a customer to build customized extension solutions on WordPress. The customers are usually website owners that have certain functionality or design requirements for their web presence. The nature of the business is personal, and customer relationships rely heavily on face-to-face meetings, alongside online documentation and customer service systems. The companies usually have some free or premium themes or plugins available to prove their competence, and drive traffic to their website. They also reach customers through advertising and direct sales. Their revenue streams are based mostly on consulting and maintenance services, and generate some income from premium themes and plugins.

The most important asset of a Boutique is experienced staff that can solve individual business needs. This staff is also expensive and correlates with the prices of the service. To provide maintenance contracts for recurring cash flows, it is also beneficial to partner with hosting companies that can provide an infrastructure for the business. The business model canvas of a Boutique is described in Figure 6.4.

<table>
<tr><td rowspan="2">Key Partnerships</td><td>Key Activities

Development activities</td><td rowspan="2">Value Propositions

Custom plugins, themes and integrations</td><td>Customer Relationships

Personal relationships</td><td rowspan="2">Customer Segments

Website owners with business critical needs for customized web services</td></tr>
<tr><td>Key Resources

Expert staff</td><td>Channels

Direct sales</td></tr>
<tr><td colspan="2">Cost Structure

Expert staff wages
Office costs</td><td colspan="3">Revenue Streams

Consulting & maintenance services</td></tr>
</table>

***Figure 6.4**: The business model canvas of a Boutique*

As an example, CrowdFavorite, founded by one of original WordPress contributors Alex King, provides consulting and web development services and is specialized in WordPress solutions. They have a service portfolio including web application design and development, integrations to other systems or services, and mobile development. They also have a set of WordPress plugins and themes that provide improved administration tools, maintenance functions, and a development framework. Their products represent higher price range, starting from $149 to $999, and their projects range from $5,000 to $100,000 based on the cost estimator available on their website.

In this study, I found three (n=64) representatives of Boutiques. They might compete with Consulting companies, but distinctively they are making custom extensions, therefore they need to be counted in the categorization of extension ecosystem business models.

6.6. Putting the patterns in context

Compared to Figure 4.4 (WordPress business ecosystem in chapter 4.7) the business models found in this research describe a more variant ecosystem and supplementing roles of the actors in it. As was found in the survey done for the WordPress community, Consulting companies that are installing and customizing single installs of the product for the end users, represent the majority of the business ecosystem. Therefore, there are also business models that support their work through the extension system.

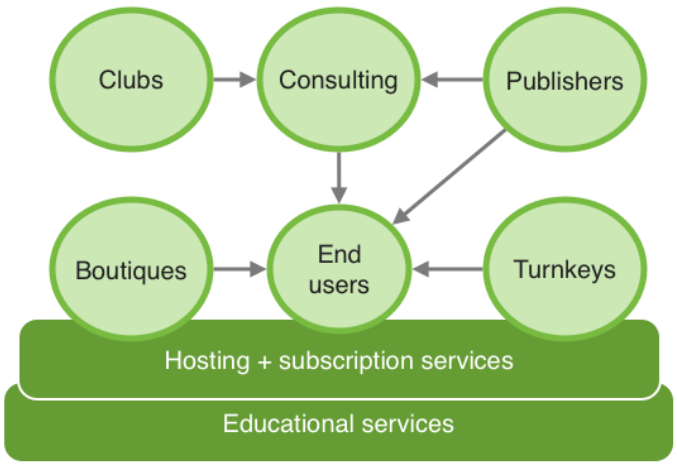

***Figure 6.5**: The actors and their relationships in the WordPress business ecosystem.*

The four business model patterns found in this research can be mapped out in the ecosystem picture as described in Figure 6.5. It demonstrates the customer relationships between the actors. Publishers serve both end users and consulting companies that want to offer a selection of ready solutions for their customers. Clubs serve only consulting companies with their development tools and resources that make customizing work more convenient. Sometimes Publishers can utilize the club business model also in their added value services for Consulting companies. Turnkeys and Boutiques target their services directly to end users and therefore compete with the Consulting companies. They might also compete with Hosting companies by providing a complete package including hosting and maintenance for the end users. Publishers may also have some solutions that utilize the Turnkey business model, but can't compete with the industry-specific knowledge with highly specialized companies.

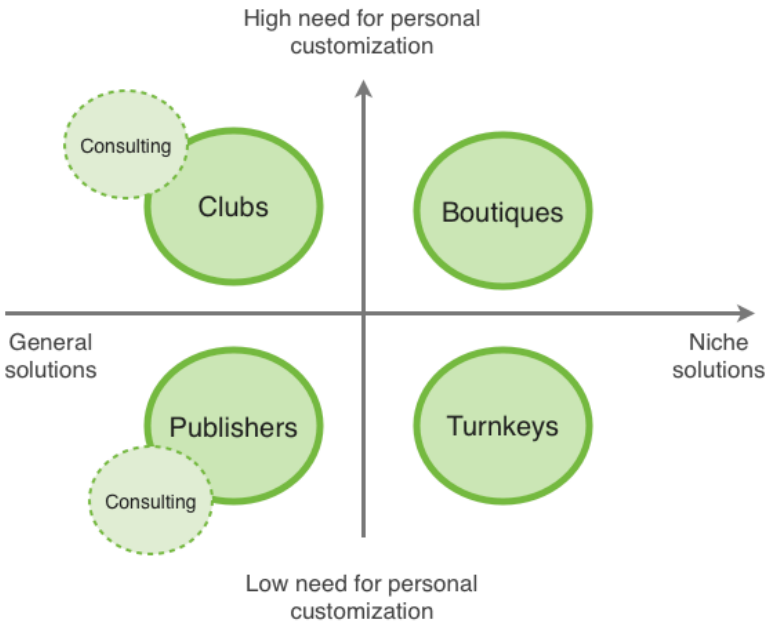

***Figure 6.6**: Comparison of the the business models based on end-user's needs.*

To understand the differentiating factors of these actors in business ecosystem we can map them out as described in Figure 6.6 through the end customer needs. On the x-axis I place the type of solution from general to niche, based on the required knowledge of the end users' industry and individual business needs. On the y-axis I place the need for personal

customization case-by-case, ranging from low to high customization. This maps the business models distinctively to the figure.

When the end user requires a general solution, meaning a situation when their website solution is not business critical nor industry specific, they can choose between a ready solution from a Publisher's selection or hire a Consulting company to find and customize a solution for them. The Consulting company can then utilize the selections of Publishers or use the resources provided by Clubs to customize a solution. The higher the need for personal customization, the more there is a need for the resources provided by a club, which the Consulting company uses.

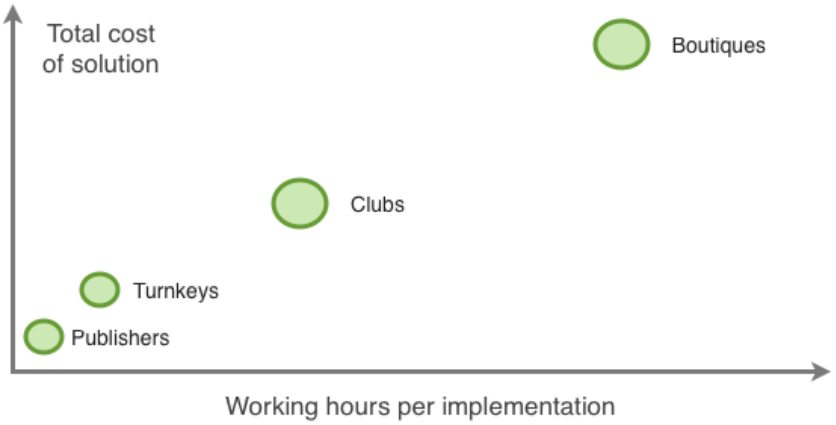

***Figure 6.7**: Comparing the total costs and working hours per implementation of the solutions of business models.*

It is also possible to compare the business models by placing working hours required by implementing the solution for end user on x-axis, and costs of that solution on y-axis. The Publisher and Turnkey solutions are based on buying a one-time license or paying a low subscription fee. The working hours required to develop these solutions are divided between all the buyers so labour costs get closer to zero every time a new purchase is made. In addition to the development costs, the installation and implementation of the solution requires some working hours, either performed by the end user, a Consulting company or as an additional service by the Turnkey. The costs of Publisher solutions range from $12 to $80 per

product and Turnkeys from $100 to $300. Adding some working hours for implementation valued at the $55/hour level, the cost of these solutions is at the range from $100 to $500.

Hiring a Consulting company to develop a solution based on frameworks or tools by a Club requires direct labour, therefore increasing the time spent and the total cost of solution. At the Consulting basic rate and with a minimum one day of work, the total cost of solution starts from the range of $500. In case the needed solution is business critical, and therefore needs custom design and extension development work, a Boutique will be the solution provider in this case. In most cases, Boutiques work in teams of expertise and involve personal working with the client, so the labour costs are dramatically higher than those of Consulting companies.

6.7. Conclusions from the pattern analysis

The business model patterns of the WordPress theme extension providers were analyzed using a pattern matching technique on the business model evidence collected from 64 companies. Based on this analysis, I found four distinctive business models: Publishers, Turnkeys, Clubs and Boutiques. Each of the business models serve the needs of the end-users, and support varying needs on the level of customization and niche solution. These businesses together with other actors in the ecosystem support each others, and sometimes compete against each other, which reinforces the business ecosystem.

In this research, I was set out to map the business models of the FOSS extension ecosystem. Chesbrough (2007) presents the taxonomy of Hybridization models in Table 2.2. These business models were Proprietary Extensions and Dual Licensing. In the analysis of this research, I found out that the variety of business models exceed this categorization, while the Proprietary Extensions provide a platform for the ecosystem of business models. Thus, all of the business models I found sell proprietary extensions, but it is only a part of their value proposition. Also, many of these models actually use the Dual Licensing as part of their pricing mechanisms, such as freemiums and various levels of licenses for developers or for multiple websites. Therefore, I would suggest to replace the Hybridization taxonomy with the four business model patterns found in this study, as described in Table 6.1.

Category	Model	Description	Example
Hybridization	Publisher	Sells licenses for extensions.	WooThemes
	Turnkey	Provides ready-made extension solutions and related services for niche customers.	AppThemes
	Club	Provides extensions, development tools and resources for Consulting companies.	iThemes
	Boutique	Develops extensions based on individual customer needs.	Crowd Favorite

***Table 6.1**: Replacing the business model categorization suggested by Chesbrough (2007).*

7. Conclusions and discussion

In my research, I have tried to define the business models that exist in extension ecosystem of FOSS products. The current literature has explained how business is possible through building proprietary licensed software on top of GPL licensed FOSS product. The architecture of a modular product enables developing extensions, which also distributes the development of FOSS product more widely, helping contributions from a wider community. These extension can also be commercial, and provide a sustainable business model. I have also reviewed the current literature on business models and categorization of FOSS business models. I selected to use the business model canvas introduced by Osterwalder and Pigneur (2010), and decided to reflect my findings against Chesbrough's (2007) taxonomy of FOSS hybridization business models.

I used WordPress as the case product of this thesis because it has succeeded to overcome many of the pitfalls that cause the death of FOSS development projects. In 10 years, a vivid business ecosystem has emerged around the freely available product, and it is driven by a keystone company Automattic – which anyway does not have a controlling role over the product. There are also several niche players in the ecosystem, supporting the work of each others and responding to end-customer needs by building knowledge, hosting knowledge-sharing communities, providing infrastructure, customizing the product to individual needs of end-users, and developing extensions that offer extra functionality for the product.

Currently, several business models have been identified in FOSS business ecosystems, and the business models enabled by the extension system are called hybridization models. Based on the research of WordPress theme developers, I suggest as my key finding that there are four distinctive business models in the extension ecosystem, novel to the literature. I have named these business models as Publishers, Turnkeys, Clubs and Boutiques.

Another important finding of this research is that the current categorization of business models represent merely the business opportunities made possible by the structure and licensing of FOSS. The actual business models are more variant with very distinctive logics and customer groups, serving the needs of the business ecosystem as a whole. This supports

the view that in literature the term business model is often used only describing a part of the business model building blocks.

This research may be one of many that contribute to the discussion on business models, and clarifies the more various possibilities in business model innovation. In many cases, the concept of business model is used loosely, without defining it more thoroughly, and describing only a part of the nine building blocks like revenue streams, or merely the business opportunity. It is important to understand that the business opportunities can be turned into a variety of business models, and sources of differentiation may exist in finding one's place within a business ecosystem rather than at a competitive position.

I would see my thesis as a step forward in understanding the business models enabled by extension ecosystems. To actually build theory on the subject, I would suggest that other successful modular FOSS ecosystems, such as Android or Drupal, would be researched through the same objectives as I did this study: finding out the business models that exist in FOSS extension ecosystems. Also, it would be important to add some information of the actual success and generation of revenues from these business models. The findings inside the FOSS context might also have relevance in closed ecosystems, which enable the building of extensions through application programming interfaces. Examples of such ecosystems are probably most notably the app ecosystems, for example Apple's iPhone AppStore or Facebook apps.

Encouraged by the example of the battlefront soldier house I used in the introduction of this research, there might be applications of extension business models even in non-software cases. The FOSS development model has proven to be beneficial in responding big problems or shared needs, creating general solutions which can be modified to suit individual needs.

Being an idealist, I would really hope to see the learnings from FOSS and extension ecosystems to be spread also outside of software for solving the wicked problems we face, for example in the contexts of climate change, renewing energy, aging population, and healthcare.

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Appendix 1: Case study questions

<table>
<tr>
<td rowspan="2">Key Partnerships

Open observations, hard to define without explicit declaration</td>
<td>Key Activities

Open observations, hard to define without explicit declaration</td>
<td rowspan="2">Value Propositions

Products
☐ Themes
☐ Plugins
☐ Theme framework with customization panel
☐ Theme coding framework for developers
☐ Child themes for framework
☐ Other WordPress-related systems
☐ Other than WordPress products

Services
☐ WP installation
☐ WP customization
☐ Web hosting
☐ Web development
☐ Premium community</td>
<td>Customer Relationships

☐ Tutorials
☐ Blog
☐ Online documentation
☐ Support forums
☐ Member login
☐ FAQ
☐ Code snippets
☐ Online chat with customer service
☐ Contact form
☐ Support ticket system</td>
<td rowspan="2">Customer Segments

☐ Consultants
☐ Personal bloggers
☐ Media
☐ Website owners
☐ Niche businesses</td>
</tr>
<tr>
<td>Key Resources

Open observations, hard to define without explicit declaration</td>
<td>Channels

☐ Affiliate program
☐ WordPress.com themes
☐ WordPress Theme listings
☐ Active PR
☐ Recommendations from users
☐ Newsletter</td>
</tr>
<tr>
<td colspan="3">Cost Structure

Open observations, hard to define without explicit declaration</td>
<td colspan="3">Revenue Streams

☐ Freemium
☐ One-time payments
☐ Lifetime membership fee
☐ Signup fee for members
☐ Monthly or regular membership fees
☐ License by number of sites
☐ Developer license
☐ Money-back guarantee
☐ Affiliates to other services (hosting etc.)</td>
</tr>
</table>

Appendix 2: List of study companies

Basic information				Business model patterns			
Company	**Company website**	**Employees**	**Country**	**Publisher**	**Turnkey**	**Club**	**Boutique**
Aloha Themes	alohathemes.com			x			
Anariel Design	www.anarieldesign.com	2				x	
AppThemes	www.appthemes.com	12	USA + Global		x		
Band Themer	www.bandthemer.com				x		
Bavotasan	themes.bavotasan.com	1	Canaba	x			
Business WordPress T	bizzthemes.com	1		x		x	
Cabfire Themes	www.gabfirethemes.com	5	USA + Europe	x			x
Catch Themes	catchthemes.com	1		x			
Chimera Themes	www.chimerathemes.com					x	
Color Labs	colorlabsproject.com	9		x		x	
Crowd Favorite	crowdfavorite.com	17	USA	x			x
CyberChimps	cyberchimps.com	3	USA	x			
Dev4Press	www.dev4press.com			x		x	
Dolce Pixel	dolcepixel.com	3	Holland	x			
Elegant Themes	www.elegantthemes.com					x	
Elmastudio	www.elmastudio.de	2	Germany	x		x	
FlexiThemes	flexithemes.com			x		x	
Foxnet Themes	foxnet-themes.fi	1	Finland	x			
Gorilla Themes	gorillathemes.com			x			
Gradient Pixels	www.gradientpixels.com			x			
Graph Paper Press	graphpaperpress.com	8	USA + Global	x		x	
Headway Themes	headwaythemes.com					x	
HeatMap Theme	heatmaptheme.com				x		
Hermes Themes	www.hermesthemes.com				x		
iThemes	ithemes.com	20	USA	x		x	
Kreative Themes	www.kreativethemes.com	2	Malaysia	x			
MintThemes	mintthemes.com	4		x			
Museum Themes	museumthemes.com	2		x		x	
MyThemeShop	mythemeshop.com			x		x	
Nice Themes	nicethemes.com	1		x			
Obox Design	www.obox-design.com		USA	x		x	

Basic information				Business model patterns			
Company	**Company website**	**Employees**	**Country**	**Publisher**	**Turnkey**	**Club**	**Boutique**
Organic Themes	www.organicthemes.com	5	USA	x			
PageLines	www.pagelines.com	5	USA+Global			x	
Press Coders	www.presscoders.com	2	UK/New Zealand	x	x		
Press75	press75.com	2	USA			x	
Pro Theme Design	prothemedesign.com	2	USA+UK	x			
RichWP.com	richwp.com	1	Canada	x		x	
Simple Themes	www.simplethemes.com			x		x	
Skematik	skematiktheme.com	1				x	
SkyThemes	skythemes.com			x			
Standard Theme	standardtheme.com				x		
Storefront Themes	storefrontthemes.com				x		
StudioPress	www.studiopress.com	30		x		x	
Styled Themes	www.styledthemes.com			x		x	
The Theme Foundry	thethemefoundry.com	4	USA	x			
Theme Furnace	themefurnace.com		England	x		x	
Theme Hybrid	themehybrid.com					x	
Theme Kraft	themekraft.com			x		x	
Theme Loom	themeloom.com			x			
Theme Shift	themeshift.com	3	Germany + Malag	x			
Theme Trust	themetrust.com			x			
Theme Warrior	www.themewarrior.com	3	Indonesia	x			
Theme Weaver	www.themeweaver.net	1		x			
ThemeFuse	themefuse.com			x		x	
Themes Zen	themeszen.com			x			
Themify	themify.me			x		x	
Viva Themes	www.vivathemes.com			x			x
WooThemes	www.woothemes.com	28	Global	x	x	x	
Working Wireframes	workingwireframes.com					x	
WP Casa	wpcasa.com				x		
WP Champ	www.wpchamp.com			x			
WPBrandit	wpbandit.com	2	USA + Sweden	x			
WPshoppe	www.wpshoppe.com	1	Nepal	x			
WPZoom	www.wpzoom.com	4	Moldova	x		x	

Appendix 3: Interview with Mr. Mullenweg

Theme 1: Matt Mullenweg
- Who are you and what are you doing?
- What is your role in developing Wordpress?
- What was your background before Wordpress?
- Why did you choose blogging?

Theme 2: Wordpress
- What is the story of Wordpress? Why did you started developing on it? What was your main motivation to make it open source?
- Tell about the developing team? Hired vs. volunteers?
- Tell about the developing process? How do you decide on the features?
- The most important development chooses made?
- What's the story of the choices made related to modularity?
- Has the in-tool updating services and plugin and theme install increased the use of add-ons?
- The tipping points of Wordpress becoming the biggest blogging tool?
- Your view on the use of Wordpress as a CMS? Does WP want to be that?

Theme 3: Automattic
- Basic facts? People, turnover, growth, business areas, financing, profitability?
- Your role in Automattic?
- The business model of Automattic?
- The role of added value services? (e.g. Akismet, Gravatar, VideoPress)

Theme 4: Community
- What kind of developer community do you have?
- How do you facilitate the community?
- What kind of choices have you made to boost the community?
- Do you think documentation is important for the ecosystem?
- How do you develop the documentation?

Theme 5: Ecosystem
- How does the ecosystem seem to you? Is it viral and are there many companies?
- What do you think are the main success factors of Wordpress community?
- How does Automattic take care of the community? Do you take the ecosystem into account?
- What kind of actors have you seen? Interesting startups?
- How are you planning to continue with the ecosystem?