Envelopment Strategies in Platform Markets Analysis of Hewlett-Packard Company

(2006-2011)

Author: Felix Rahmede University of Twente P.O. Box 217, 7500AE Enschede The Netherlands

ABSTRACT:

Platform Markets are not a new phenomenon. However, it is companies like Google, Apple, Facebook and Amazon with their enormous growth rates and vast market capitalization that fueled the interest of today's scholars and practitioners. How do ICT platform companies, such as these, innovate their business model over time in order to maximize profit? It is expected that envelopment is one of the key aspects driving the innovation of business models in the ICT Platform industry. Eisenmann (2011) laid the foundation for such an analysis with his typology of envelopment, which distinguishes three different kinds of envelopment. However, he left open how and when which type of envelopment is best utilized in order to achieve long term financial success. In order to capture this, this study has investigated the envelopment pattern of HP from 2006 to 2011 by means of analyzing the introductions of new value propositions. This resulted in the finding of a correlation between the number of markets enveloped and financial success. However, this correlation by itself is by no means generalizable! Only after exposing the underlying envelopment strategy utilized by HP, generalizable conclusions could be drawn. After a comparison of the findings with Müller (2015), two distinctive envelopment strategies for ICT platform companies, that lead to long term financial success and sustainable envelopment, could be identified. Finally, an updated version of Müller's (2015) Envelopment Matrix has been derived, illustrating the two distinctive strategies that are expected to be valid for a wide spectrum of the ICT platform Industry.

Supervisors:

Björn Kijl

Bart Nieuwenhuis

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Business Model Innovation, Platform Markets, Value Proposition, Envelopment, ICT, Hewlett-Packard Company

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1. INTRODUCTION

1.1 Platform Markets in the 21st Century

"Uber, the world's largest taxi company, owns no vehicles. Facebook, the world's most popular media owner, creates no content. Alibaba, the most valuable retailer, has no inventory. And Airbnb, the world's largest accommodation provider, owns no real estate. Something interesting is happening" (Goodwin, 2015). What Tom Goodwin is referring to are platform dynamics and their development, which indeed is a captivating phenomenon that occupies today's scholars around the world.

Consumers around the world have long been in contact with markets identified as platform markets or two-sided markets. Prominent examples of these are gasoline stations, DVD rentals or video games. These markets have experienced increased attention in the last years due to the emergence of information communication technology, which revealed the true potential of platform markets. Google, Apple, Facebook and Amazon (GAFA) are leading examples for harvesting this enormous potential in the form of monetary value, by tapping into - and developing new markets, capitalizing on network effects and creating superior value. In January 2016 the GAFA companies had a market capitalization of \$1.7 trillion (Die Welt, 2016). The fast growth rate and vast market value of companies operating within this environment, among other factors, have shifted the academic attention of scholars towards platform markets (Sriram, et al., 2014; Gawer & Cusumano, 2008; Cennamo & Santalo, 2013).

Furthermore, with people spending twice as much time online as compared to ten years ago, with 16 to 24 year olds nearly tripling their online time (Ofcom, 2016), the importance of ICT is also growing and with it, its markets. In the last year it has become evident that large ICT companies such as GAFA are at open 'war' with each other. These four giants have initially founded their business in substantially different market segments (online search; software & hardware; social media and online retailing). However, they recently started leaving their core market using innovative approaches, strategies and business models to fight for market share and expand into each other's core markets (The Economist, 2012).

This war for dominant platforms and its underlying dynamics in the ICT industry, call for an analysis of how ICT companies innovate their business models to outcompete the other players in the ICT industry (Visnjic, 2012).

1.2 Problem Statement

Gawer & Cusumano (2008) identified two strategic options or approaches to fight for dominant platforms. Firstly, coring, which is essentially the creation of a new platform where none existed before. Secondly, and of high interest for this paper, tipping, a way to win platform wars by building market momentum. The key to this approach is to absorb and bundle features of an adjacent market. "Tipping across markets occurs when a company crosses over the boundary of its existing market to absorb technical features from an adjacent market and bundle them to extend the company's platform" (Gawer & Cusumano, 2008, p. 33). This method is called "bundling" or "tying" and has been widely acknowledged by scholars as the suitable and effective approach for attacking market share especially of platform companies (Parker & Van Alstyne, 2005; Rochet & Tirole, 2006; Rochet & Tirole, 2008; Gawer & Cusumano, 2008; Eisenmann, Parker, & Van Alstyne, 2006; Carlton & Waldman, 2002). Eisenmann et al. (2011) further

advanced this notion and developed the typology of Envelopment Attacks. "Envelopment entails entry by one platform provider into another's market by bundling its own platform's functionality with that of the target's so as to leverage shared user relationships and common components" (Eisenmann, Parker, & Van Alstyne, 2011, p. 1271). They identified three types of envelopment. The Envelopment of complements, the envelopment of weak substitutes, and functionally unrelated envelopment with three conditions for maximizing its chance of success: User overlap, price discrimination benefits and economies of scope, respectively.

This typology lays a foundation to understand with which mechanism ICT platform companies are attacking each other. However, it is little more but a start to this process of understanding. Eisenmann et al. (2011) have merely identified the 'who' and 'where', but several other aspects remain unknown. What is the essential reason for firms to start envelopment attacks i.e. why do they envelop other markets? What markets should a firm envelop? When is the right time to do so? What is the effect of envelopment on company performance? And most alluringly, how do firms envelop other markets in practice? With this in mind it is apparent, that more research in this area is required in order to gain deeper insights about the envelopment practices of platform companies (Visniic, 2012). Is envelopment the underlying quintessence behind the immense growth rate and prodigious profitability of ICT platform companies such as GAFA? If yes, can significant arguments be found that envelopment via product bundling is a best practice approach in the ICT platform industry and how substantial is the impact of the before mentioned conditions on the success of envelopment?

1.3 Research Question

With regard to these questions, it becomes evident, that little attention has been paid to the envelopment behavior in practice of rival platforms in neighboring markets (Visnjic & Cennamo, 2013). Furthermore, the theoretical know how about envelopment is still at a preliminary/infant state. In order to gain deeper insights into the envelopment practices of ICT companies acting in platform environments and in an attempt to establish a link between scholars and practitioners in this field, the following research question has been derived: How do ICT platform companies innovate their value proposition over time in the quest of maximizing profit?

In order to address the research question, this paper will use data in an inductive, content based study approach. In more detail, the press releases of Hewlett-Packard Company from 2006-2011 will be collected, and scoured for value propositions. Said value propositions will be categorized with the help of an updated layer model based on the ICT layer model of Fransman (2010). Lastly, the data will be linked to profit figures to enable an examination of the correlation between envelopment practices and company performance.

1.4 Why HP

HP originated as an original equipment manufacturer of computing hardware. However, these days are in the distant past and today HP operates in complex platform markets spread through different layers of the ICT industry. It is expected that the innovation of their business model, i.e. the introduction of new value propositions, throughout 2006-2011 is a major indicator of the company's revenue and that its effect on profitability can be measured. This paper is part of a research circle that analyses envelopment patterns and behavior of ICT platform companies. The majority of this research has been

targeting companies with a sole focus on software, applications and content. However, companies that also manufacture hardware got paid little attention so far. Nevertheless, the focus will still be laid on software introductions, to assure comparability. It is therefore assumed, that the results obtained in this paper will increase the validity of the circle research, when generalizing the results on the whole ICT industry.

1.5 Research Gap

In order to analyze the innovation of business models over time, the term business model must first be clearly differentiated, as it is often misused and falsely interpreted as a strategy or tactic (Magretta, 2002; Shafer, Smith, & Linder, 2005; Al-Debei & Avison, 2010; Casadesus-Masanell & Ricart, 2010; Teece, 2010). A clear definition of a business model, business model innovation and the distinct role value propositions play in the value creation and value capturing process will be arrived at. This will enable an isolated investigation regarding the value proposition innovation process, which is expected to serve as an indicator of envelopment practices performed by ICT companies.

Past publications on platform/two-sided markets have mainly focused on the business environment, more specifically how companies can make use of industry characteristics to their best advantage. In order to give an overview, some of the most prevailing literature in this domain is subsequently listed. The Analysis of competition in platform markets (Shankar & Bayus, 2003; Armstrong, Competition in two-sided markets, 2006). The explanation of the chicken & egg dilemma (Caillaud & Jullien, 2003). The identification of strategic trade-offs in platform markets (Cennamo & Santalo, 2013). The examination of two-sided network effects direct and indirect (Shankar & Bayus, 2003; Clements & Ohashi, 2005; Parker & Van Alstyne, 2005). A discussion about platform envelopment (Eisenmann, Parker, & Van Alstyne, 2011). Identification of strategies for two-sided markets (Eisenmann, Parker, & Van Alstyne, 2006). How companies become platform leaders (Gawer & Cusumano, 2008). Success and failure in winnertake-all markets (Schilling, 2002). How to battle for technological dominance (Suarez, 2004).

However, a specific analysis of how ICT platform companies innovate their business model via new value propositions and the isolated effect that has on company development and monetary performance over time is lacking, as little attention has been paid to competition emerging from rival platforms in neighboring markets (Visnjic & Cennamo, 2013). Hence, this analysis is expected to significantly contribute to an understanding of the envelopment practices of ICT platform companies.

1.7 Outline

The remainder of this thesis will be structured as follows. After this introduction the theoretical framework will shed light on the existing literature regarding business models, platform markets and envelopment. After this a method section will explain the gathering, organizing and coding of the data. In the following analysis part, the data will be analyzed and implications will be drawn. Lastly, a discussion section will discuss the results and implications and draw conclusions.

2. THEORETICAL FRAMEWORK

2.1 Platform Markets

In traditional manufacturing environments, markets have a bilateral structure. Merchant and customer linearly interact with each other. In contrast, platform market exchanges are trilateral. Meaning that there is not a linear relationship between parties, but one of a triangular nature. Thus, platform markets can be described as markets with triangular structure, where users interact with each other as well as with platform providers (Eisenmann, Parker, & Van Alstyne, 2011; Rochet & Tirole, 2006). Scholars refer to these markets, among others, as platform markets, two-sided markets or two-sided platforms, whereas two sided refers to the two different groups of users of a platform. However, platform markets can also be multi sided i.e. more than two distinct platform user groups (Rochet & Tirole, 2006).

The triangular structure changes the fundamental nature of business within platform markets. Identified as the academic pioneers on two-sided platforms (Evans, 2006), Rochet & Tirole later supposed "Conceptually, the theory of two-sided markets is related to the theories of network externalities and of (market or regulated) multi-product pricing" (Rochet & Tirole, 2006, p. 646).

As pricing is not of relevance for this paper, an elaboration of multi-product pricing will be relinquished. Network effects or network externalities are defined as the following: "Network externalities are "positive consumption externalities," whereby the value a user derives from a good increases with the number of other users of the same or similar good" (Schilling, 2002, p. 387). The notion that platform markets are not only related but driven and defined by network externalities is widely shared and adopted among academic scholars. Moreover, network externalities in platform markets do not only occur within one user group, but across user groups (Sriram, et al., 2014; Cennamo & Santalo, 2013; Eisenmann, Parker, & Van Alstyne, 2011; Gawer & Cusumano, 2008; Eisenmann, Parker, & Van Alstyne, 2006; Armstrong, 2006; Parker & Van Alstyne, 2005). Inferring, that one user group not only gains benefits if it is growing, but most often gains benefits if the other user group is growing. The growth of one user group is nothing else as the growth of an installed base and of the other group typically represents a form of (a) complementary good(s). Consequently, it is evident, that the notion of network externalities within platform markets is conjoined with Schilling's (2002) early emphasis on installed base and complementary goods within platform markets. Moreover, modern scholars still agree with this view. "A platform is simply more attractive the larger is the base of consumers using it" (Mohagheghzadeh & Svahn, 2015)

2.2 Envelopment & ICT Layers

2.2.1 Envelopment

As elaborated in the problem statement, the most suitable way, as identified by scholars, to fight for dominant platforms is tipping across markets by bundling or tying (Rochet & Tirole, 2008; Gawer & Cusumano, 2008; Rochet & Tirole, 2006; Eisenmann, Parker, & Van Alstyne, 2006; Parker & Van Alstyne, 2005; Carlton & Waldman, 2002). The aim of bundling is to create value that it is greater than the stand the stand alone value of your competitor's platform, as perceived by the end user. This entails absorbing technical features from another market and combine them together with features of your own, thus, creating a bundle. To create superior value a company integrates the functionality of its own platform with that of the targets by leveraging shared user relationships and common components. This act of attacking an adjacent platforms market share is called envelopment (Eisenmann, Parker, & Van Alstyne, 2011). A prominent example of envelopment, is the addition gaming functionality by the iOS

platform, swallowing the functionality of hand held gaming platforms such as the PlayStation Portable (PSP) and the Nintendo DS. Another example would be the addition of digital photography to smartphones, by which they successfully enveloped the market of digital cameras.

2.2.2 ICT Layers

When regarding ICT products, it becomes evident that they occur at different levels (e.g. Hardware & Software). Thus, one cannot simply categorize them as product or service like in traditional market sectors but a more differentiated categorization is required. Fransman (2010) developed a taxonomy of ICT products categorizing them into different layers enabling a more distinct analysis.

The four layers of the new ICT ecosystem

Layer 1: Networked elements (including switches, routers, servers, PCs, phones, etc.)
Layer 2: Converged communication and content distribution networks (including mobile, fibre, copper, cable, satellite)
Layer 3: Platforms, content and applications (including ICAPs)
Layer 4: Final consumers

Exhibit 1: Fransman (2010); p.9

The four layers of the new ICT ecosystem are ordered in a hierarchical manner. The first layer entails networked elements, i.e. hardware/devices. The second layer is called "Converged communication and content distribution networks", which is essentially the connecting layer between hardware and software. The third layer includes platforms, content and applications, i.e. software. The fourth layer represents the final consumer. The first and second layer are made up of physical goods, necessary for the third layer to function and operate. Yet, it is the third layer in which content is provided to the final consumer. Therefore, it is no surprise that the third layer is the focus and base for most envelopment attacks. In regard to Zahavi & Lavie (2009), who created an extensive software product classification (Appendix 1), and the importance the third layer has for envelopment, it has been decided to further subdivide the third layer into subcategories. This will enable a more detailed and focused analysis of value propositions later on.

| Category | Specification |
|-----------------------|---|
| 1 | Device |
| 2 | OS |
| 3 | Network |
| 4a) b) c) d) | Platform Content Application Service |
| 5 | Consumer |

Exhibit 2: Updated Layer Model Based on Fransman (2010)

2.2.3 Envelopment Typology

This updated layer model with subcategorization enables a deeper understanding of envelopment. However, before a more thorough insight on envelopment can be gained, it is of importance to first understand the nature of relationships between platforms. Eisenmann et al. (2011) determined that any two platforms have to be related in one of the following three ways. They must be complements, substitutes or

functionally unrelated. Based on this, Eisenmann et al. (2011) distinguished three different types of envelopment.

Platforms are usually organized in layers (Sangiovanni-Vincentelli & Martin, 2001; Eisenmann, Parker, & Van Alstyne, 2011). A single firm often dominates one layer on the foundation of economies of scope. In order to gain a greater share of the industry, a dominant firm in a layer oftentimes launches envelopment attacks against adjacent layers. This is called the envelopment of complementary goods and will forth be referred to as type I envelopment. Type I envelopment is most likely to succeed with a high overlap in user base of the different layers (Eisenmann, Parker, & Van Alstyne, 2011).

Theoretically, the willingness to pay for a bundle of two perfect substitutes would equal the price of either one of the substitutes separately. In contrast to bundling perfect substitutes, the bundling of weak substitutes creates value. This is because weak substitutes serve an equal broad purpose but address different kinds of specific user needs. With a small part of consumers having both specific needs, an overlap to some extend will be given. Consequently, a fraction of users will be utilizing both substitutes. However, with only moderate overlap of user bases, bundling by itself will not produce relevant gains. The level at which a user values a bundle of weak substitutes will only surpass the value of the preferred product if the other product offers distinctive functionality. Therefore, it will be required to vastly discount the bundle, offer distinctive functionality or optimally both in order to sell it. This is called the envelopment of weak subsites and will forth be referred to as type II envelopment. To be able to realize these vast discounts, the attacker has to realize significant economies of scope. Accordingly, type II envelopment is most likely to succeed when the attacker can realize significant economies of scope (Eisenmann, Parker, & Van Alstyne, 2011).

Even with fundamentally differing purposes, such as mobile phones and hand held gaming devices, two separate platforms may still share common components and user overlap. Leveraging these, the envelopment of such a fundamentally different platform fuels convergence. This combines functions of previously separate products into a single product, just as the former example of iOS envelopment of hand held gaming devices. This type of envelopment is called the envelopment of unrelated platforms and forth will be referred to as type III envelopment. If both platforms share a significant user base overlap, there are ought to be opportunities for share gains by bundling both platforms at a price that approximates the price for the platforms sold separately. Usually functionally unrelated platforms do not share common components. Some however, e.g. phone and internet, do share common components. In that case economies of scope can be realized. Correspondingly, type III envelopment is most likely to succeed when the platforms have significant user overlap and when economies of scope are high (Eisenmann, Parker, & Van Alstyne, 2011).

Eisenmann et al. (2011) defines conditions for each type of envelopment, yet key questions for practitioners remain unanswered. When is the right time to launch an envelopment attack, or under which circumstances what type of envelopment should be used? How does a growth strategy need to be structured and incorporate envelopment in order to create long term financial success and sustainable envelopment?

2.3 Business Model

There is lack of consensus between scholars about the boundaries of business models. Besides, the concept of the

business model itself is oftentimes used wrongly in literature and moreover, interchangeably used with terms such as strategy or tactic (Al-Debei & Avison, 2010; Casadesus-Masanell & Ricart, 2010; Teece, 2010; Shafer, Smith, & Linder, 2005; Magretta, 2002). This calls for a clarification of the concept of a business model in order to set way for an isolated analysis of business model innovation and its effect on company revenue. A reason for this lack of consensus is because business models are briskly updated and renewed in order to cope with today's fast moving business environment (Al-Debei & Avison, 2010). At its core however, scholars reached consensus on the matter that a business models is based on three main aspects. These are value creation, value delivery and value capturing (Teece, 2010; Chesbrough & Rosenbloom, 2002; Amit & Zott, 2001).

First of all, the differentiation between a business model, strategy and tactic is to be determined. "Business Model refers to the logic of the firm, the way it operates and how it creates value for its stakeholders; and Strategy refers to the choice of business model through which the firm will compete in the marketplace; while Tactics refers to the residual choices open to a firm by virtue of the business model it chooses to employ" (Casadesus-Masanell & Ricart, 2010, p. 196). This clear cut differentiation is ought to dismantle any further confusion between the terms. However, the definition of a business model by Casadesus-Masanell & Ricart may differentiate it from tactics and strategy, but does not give a clear cut of what the business model actually is. Chesbrough & Rosenbloom, in one of the most cited articles on business models, define a business model as following: "In the most basic sense, a business model is the method of doing business by which a company can sustain itself-that is, generate revenue. The business model spells out how a company makes money by specifying where it is positioned in the value chain" (Chesbrough & Rosenbloom, 2002, p. 533). This definition provides a solid foundation but is not yet concrete enough for the purpose of this paper, as platform companies often operate in value networks rather than value chains. Zott & Amit provide an on point but yet comprehensive definition of a business model that is seen as suitable and appropriate for this paper: "A business model is geared toward total value creation for all parties involved. It lays the foundations for the focal firm's value capture by codefining (along with the firm's products and services) the overall 'size of the value pie,' or the total value created in transactions, which can be considered the upper limit of the firm's value capture potential" (Zott & Amit, 2010, p. 218).

2.4 Business Model Innovation

As Zott & Amit's (2010) definition of a business model has been used and seen as appropriate for this paper, it is expedient to also rely on them for a definition for business model innovation. They defined business model innovations as: "[D]esigning a modified or new activity system, rely[ing] on recombining the existing resources of a firm and its partners, and does not require significant investments in R&D" (Amit & Zott, 2010, p. 2). At the core of this definition lies the recombination of existing resources. That is fundamentally the same core as envelopment, which at its essence also uses the recombination of resources in order to attack adjacent platforms (Eisenmann, Parker, & Van Alstyne, 2011). Hence, it is concluded that envelopment is a specific form of business model innovation used by platform companies, with value propositions as a subset of business models. This reinforces the procedure of this paper to analyze the envelopment behavior of ICT platform companies by examining their value propositions over time and thus, shed light on the way these companies innovate their business model over time in pursuit of maximizing profit.

3. METHODOLOGY

The objective of this paper is to shed light on the phenomena of platform envelopment by ICT companies in practice and hence, reveal how these companies innovate their value propositions over time in pursuit of maximizing their profit. In order to do this, an inductive, content based case study has been conducted. The chosen company in this setting is Hewlett-Packard Company. The following section will elaborate the reasons why the given company have been chosen and give insight into background, growth and profitability.

3.1 Case Company HP

HP tells a fairy-tale story of entrepreneurship. It all started out with a one car garage in Palo Alto, two electrical engineers and an initial investment of \$538. Initially HP produced a line of electronic test equipment, today HP has revolutionized the personal computer industry and is the second largest personal computer vendor with 18.2 % market share in 2015. As one of the only companies alongside apple in a comparative research circle that is not solely focused on software, HP is expected to gain valuable insights to enhance the understanding of company's envelopment practice that were active in platform environments between 2006 and 2011.

As of 2011 HP was an ICT giant, operating in platform environments, accumulating double figure billion-dollar gross profit. HP posted a revenue growth of 38.7% from 2006 to 2011 with a gross profit growth of 33.8%. HP's return on capital invested ranged from 10.7% in 2010 to 16.8% in 2008. Key figures for HP can be found in appendix 2.

It is expected that the fluctuations in profitability and growth figures can be partly accounted for by differences in envelopment behavior. As mentioned before this will be tested by analyzing value propositions, i.e. product introductions, in the given time frame. Concerning, external validity it has to be admitted that by itself, this case study does not yield high external validity. However, it is assumed that the chosen company is highly representative for personal computer vendors. As this study is part of a larger research circle, analyzing envelopment in ICT platform environments, it will however, substantially increase the generalizability of this envelopment research. Henceforth, this paper will substantially increase the external validity of the research circle.

3.2 Data Collection

In an attempt to capture the value created by HP between 2006 and 2011, a total of 566 new product introductions have been analyzed and categorized. This includes new versions of existing products. The required information has been deducted from 2988 press releases. The primary source for these press releases was the official company websites of HP. These include external press releases but also news articles that are published only on the company website. However, for some time spans during the time of study, official website articles were not available. In that case Factiva has been used as a second source of information. Factiva is an online source of information, that provides all press releases which are sent to wires. Due to the fact that the press releases were gathered from official company websites and Factiva, it is assumed that there are no flaws in the data, which assures a high reliability for this study.

3.3 Data Analysis

To enable a thorough analysis of the gathered data, it first had to be categorized. This was conducted in a four step process. Firstly, basic at hand information about the new value propositions have been directly extracted from press releases and blog posts. Among this information was launch date, company name, product name, product type and customer classification. A table of this can be found in appendix 3.

Secondly, a product category has been determined. In this step new value propositions will be classified as a product launch or a new version of an existing product. Moreover, each new value proposition has been categorized as one of the following: Launched with partners, launched in a bundle or platform. This is intended to verify that it was in fact envelopment, by which HP attempted to maximize profit. An overview of this can be found in appendix 3.

Thirdly, the new value propositions have been investigated according to the updated layer model (see Exhibit 2) based on Fransman (2010). This enabled a more elaborate understanding of the ecosystem in which HP operates.

Fourthly, the software product classification of Zahavi & Lavie (2009) has been used to further subcategorize software products (see appendix 2). This was done to enable a retracement of the markets these new products were ought to envelop.

Lastly, it is worth mentioning that all papers in the before mentioned research circle have and will be ought to use this or an almost identical four step process to classify new value propositions. This will assure methodical rigor and thus, a high external validity when combining research results to draw generalized conclusions about the envelopment practices of ICT platform companies.

3.4 Testing for Growth and Profitability

As mentioned earlier the envelopment behavior of HP will be examined through the lens of value proposition innovation over time. Furthermore, to determine how envelopment effects the growth and the profitability of HP the following measures have been taken. Revenue and gross profit serve as an indicator for growth. While revenue would be enough to determine growth, it has been decided that adding gross profit as an indicator increases accuracy and together with revenue provides a more comprehensive overview of company growth. Return on capital invested will serve as an indicator for profitability. Exhibit 3 displays the development of HP's revenue, gross profit and return on capital from 2006 until 2011.



Exhibit 3: Revenue, Gross Profit and Return on Capital of HP from 2006-2011

The graph illustrates what has already been indicated in part 3.1. HP grew their revenue and gross profit relatively steadily over the given time. Simultaneously HP's return on capital, i.e. profitability, fluctuated minorly with a maximum deviation of 3.6% from the starting value in 2006.

4. ANALYSIS

How do ICT platform companies innovate their business model over time in order to maximize profit? In order address this question this paper attempts to grasp the underlying logic of value creation through new value propositions and thereby further our understanding of platform envelopment.

The analysis of 2988 press releases published by HP revealed a total of 566 new value propositions, 439 of which were new versions, in the timeframe from 2006 until 2011. 240 of these 566 new value propositions have been classified as categorizeable according to Zahavie and Lavie's taxonomy (2009). At this point it is important to be noted, that the following analysis is solely based on this subset of 240. This approach assures comparability to solely software based companies in the given research circle. Nevertheless, it has to be considered, that the financial data in exhibit 3 and all subsequent sections of this paper is of HP as whole, i.e. not just HP's software business.

4.1 Markets Served

Firstly, to better understand the way in which HP creates value, a look will be taken at customer classification and ICT layers in which HP was active. Of the total 240 value propositions, 203 were aimed at the business to business (B2B) market, 21 at the business to consumer (B2C) market and 16 were aimed at both. Illustrated over the given time frame this looks as follows.





When regarding exhibit 4 it quickly becomes apparent, that HP's software portfolio is not consumer focused, as 85% of software related value propositions were aimed at the B2B market. Furthermore, with 72% of new value propositions located on 4c (Application) in the ICT layer model (exhibit 2), it can be identified as HP's key focus. Mentionable are also 4d (Service) with 11% and new value propositions ranging across multiple layers including layer 1 (Device) at 12%. Thus, it is concluded that HP's software business is focused on applications for the B2B market. Now that a better understanding of how and for whom HP created value is reached, the foundation for a more comprehensive analysis is given.

4.1 Market Presence

Exhibit 5 illustrates the market presence of HP over time, additionally displaying the number of core markets and the number of markets enveloped.



Exhibit 5: Market Presence of HP

Core markets are markets with a market presence of five or more value propositions (Zahavi & Lavie, 2009). Markets that have between two and four value propositions are forth classified as intermediate markets. In exhibit 5, it is clearly visible that while only having two core markets in 2006, HP was active in a total of 12 markets. Moreover, out of 24 new value propositions in 2006, 11 were located in two markets. The remaining 13 value proposition were spread across 10 markets, with eight markets only having one value proposition. These markets with only one value proposition are forth classified as experimental markets. Consequently, it can be said that HP had a dispersed portfolio in 2006.

With six new markets entered, 2007 marks the year with the highest rate of envelopment for HP. Three new markets were enveloped as new experimental markets and one was immediately enveloped with 6 value propositions as a new core market. Out of the eight experimental markets in 2006, only three remained experimental, as new value propositions were introduced in the other five in 2007, strengthening HP's presence in these markets.

In 2008, HP further penetrated five of the six experimental markets it had in 2007 advancing them to intermediate markets. The other market has been dropped, as no new value propositions were introduced over the time of study. Additionally, one new market was enveloped on an experimental basis. However, this marked was later dropped. Envelopment behavior in 2008 was low, which is assumed to have been a preparation for 2009.

Building up to this, it was 2009 in which the most growth, in terms of market presence, can be seen. In this year HP not only expanded its market presence by penetrating four markets with increased number of value propositions and thus, making them core markets, but also enveloping four new markets. Three of these markets were enveloped on an experimental basis.

Another observable phenomenon in exhibit 5 is the percentage of total markets being core markets. In 2006 only 17% of HP's markets were core markets. In contrast, 2011 a formidable 50% of HP's markets were core markets. Furthermore, only two of the 12 markets HP was active in 2006 did not become core markets until 2011. Both of these markets were experimental markets in 2006.

In 2010 and 2011 a strong deceleration of HP's envelopment behavior can be observed. In the two years combined HP only enveloped a total of 3 new markets and only strengthen two of its markets to core markets. Simultaneously, HP introduced 45% of its new value propositions in only three markets, further leveraging their strongest markets. It is believed, that this ad hoc change in envelopment behavior is ought to have been caused by external factors. In order to understand the reason behind this change of envelopment behavior, and assess if it was in fact a consequence of external factors, this paper will compare HP's financial data with its envelopment data. It is expected that this will enable a more thorough analysis of events and macroeconomic factors that influenced HP in the given time.

4.2 Envelopment and Financial Data

The financial data in exhibit 4 points out, that in 2009 all of the three chosen financial indicators experienced a downturn. This by itself is nothing anomalistic. When plotted against HP's envelopment data however, something eccentric becomes apparent.



Exhibit 6: Markets Presence & Revenue

Apparent at first sight, it is evident that HP's revenue and envelopment are positively correlated. A strong envelopment behavior in 2007 is associated with a solid gain in revenue in 2007. Another strong envelopment phase took place in 2009, this time however, the before declared positive correlation did not cause revenue to increase. In fact, it is the only year in the timeframe that revenue fell compared to the year before. This is assumed to have an underlying cause. In order to confirm this observation, HP's market presence was also plotted against the gross profit figures and against the profitability indicator return on capital invested.



Exhibit 7: Market Presence & Gross Profit

In exhibit 7, the same phenomena as in exhibit 6 is evident. A positive correlation between markets enveloped and gross profit is apparent, however does not hold up for the year 2009.



Exhibit 8: Market Presence & Return on Capital

The positive correlation between return on capital and envelopment is weak compared to the other financial indicators. Nevertheless, it can be seen that the same phenomena occurred along all financial indicators in 2009. So why did financial results drop although an otherwise positive correlation would suggest them to increase. The underlying reason behind this are macroeconomic factors. 2009 was year the global financial crisis hit and the world saw the S&P 500 index plunge by 18.6% between January 1st and the 27nd of February, the worst start to a year in its history (Wikipedia, 2016). As previously mentioned, it is assumed that HP planned a big expansion in 2009, like indicated by the envelopment data. It is expected that this expansion turned out to be on a lot smaller scale than planned by HP, due to this crisis. Nevertheless, the increased envelopment positively impacted the financial data, as the positive correlation would indicate. It is expected that without this expansion, i.e. the largest number of value propositions introduced in the time of study, the dip in revenue, gross profit and return on capital would have been a lot bigger.

This explanation of events goes hand in hand with HP's envelopment behavior in the two subsequent years. As mentioned earlier, in 2010 and 2011 HP cut back on its envelopment and really focused on its strongest markets, with 45% of new value propositions appearing in only 3 market segments. In regard to the events in 2009 this seems very feasible. HP recognized the crisis and its risks, and tried to mitigate its consequences. This was done by cutting cost and leveraging their strongest markets for maximum revenue and profit. Mark V. Hurd, CEO of HP at the time acknowledged this in his CEO letter to the shareholders in the annual report for 2009. "In 2009, the global economy experienced the worst recession in a generation...Beginning in our first fiscal quarter, we had to address a rapidly deteriorating demand environment across our product portfolio" (Hewlett-Packard Company, 2010, p. 2).

Nevertheless, the vast drop in return on capital invested i.e. profitability, in 2011 is yet to be accounted for. This time however, it is not a consequence of macroeconomic factors but rather internal reasons that caused this disruption. Effective as of 1st November 2015, Hewlett-Packard Company was split into two publicly traded companies: HP Inc. and Hewlett Packard Enterprise. Though this seems to be highly irrelevant for HP's profitability in 2011 at first sight, it did in fact have a major impact on it. Jessica Scanlon, a writer for techradar, identified that it was in fact 2011 in which the first inklings of a possible split of HP occurred. Apotheker, CEO of HP at the time, talked about the potential spin-off of HP's personal computer business, sending 'ripples' through the market (Scanlon, 2015).

These occurrences ultimately resulted in a deterioration of HP's return on capital by almost a third from 15.4% in 2010 to 10.7% in 2011.

In the subsequent section, this paper is going to analyze what envelopment approach HP has taken and compare that to the envelopment approach of other ICT platform companies. Before the discussion part of this paper begins, the following is to be acknowledged. The financial crisis was a macroeconomic incident and therefore, affected the vast majority of large companies in the western world and forced them to adapt. Hence, it is only logical that these factors have also affected the companies who HP will be compared to in the subsequent section. Consequently, no more specific attention will be paid to factors being the consequence of the financial crisis.

5. ENVELOPMENT MATRIX

The envelopment behavior of HP has been reviewed in detail in section 4.1. By itself however, these insights hold a limited value for scholars and practitioners. This is why the results of this paper will be compared and analyzed against the findings of Christoph Müller (2015) using the envelopment typology developed by Eisenmann (2011). This will uplift the small external validity of this single case study analysis and enable a more thorough analysis based on a comparative case study approach. With this modus operandi this paper assures, that the latter drawn conclusions are valid for a wider spectrum of the ICT industry.

5.1 Comparison of Envelopment Strategies

Müller (2015) analyzed the envelopment approach of Google and Yahoo. He has split his analysis in two phases labelled p1 and p2. P1 ranges from the firm's inception until 2005 and p2 from 2006 until 2011. Even though the timeframe of this paper only covers p2, it is believed that there are still valuable insights to be gained from a comparison.

In 2006 HP's software portfolio consisted of 24 new value propositions in a total of 12 markets, with 2 core markets and 8 experimental markets. Accordingly, HP's value portfolio was dispersed and characterized by weak market presence. In contrast, according to Müller (2015) Google's value portfolio in p1 was focused and characterized by increasing market presence, while Yahoo also had a dispersed value portfolio with weak market presence.

By 2010-2011 HP's value portfolio was dispersed and characterized by strong market presence, as their value propositions stretched over 26 software markets by 2011 with as many as 13 core markets. Yahoo however, had a focused value portfolio in p2 with relatively strong market presence, while Google's value portfolio in p2 was dispersed and characterized by strong market presence (Müller, 2015). At this point the careful reader will have realized, that HP's value portfolio in 2006 was similar to Yahoo's in p1. Nonetheless, in 2010-2011 HP's value portfolio is fundamentally different than Yahoo's in p2. In order to illustrate this, the Envelopment Matrix of Müller (2015) was used, and the growth trajectories of the three companies compared. The different growth paths can be seen in exhibit 9.



Exhibit 9: Envelopment Matrix based on Müller (2015) – Illustrating Growth Trajectories of Google, Yahoo & HP

Müller (2015) concluded that the path taken by Google i.e. Google's envelopment strategy based on envelopment type I & II, can be considered as a role model for the ICT platform market. Moreover, the path taken by Yahoo initially based on envelopment type III was considered to be 'not sustainable', not resulting in revenue growth on the long term. Exhibit 9 however, tells a different story. The path taken by HP, and therefore their envelopment strategy, is very similar to the one intended by Yahoo, also relying in type III envelopment, yet yielded comparable results to Google's. The subsequent section will investigate the underlying reasons behind HP's success with a strategy that was otherwise considered to not be successful.

5.2 Success Factors for Envelopment

Yahoo started with a dispersed market portfolio and weak market presence. Thereafter, Yahoo failed to increase its market presence in its experimental markets leading to the big drop visible in exhibit 9. HP started off in a very similar way. Following this start HP did manage to increase its market presence in its experimental markets, gaining market presence while still having a dispersed value portfolio. How was this possible for one but not the other? What were the underlying factors? In order to gain these insights, a look will be taken for the reason of Yahoo's failure.

5.2.1 Reasons for Yahoo's Failure

Extracted from Müller (2015) the three main reasons for Yahoo's failure have been identified. Firstly, Yahoo enveloped unrelated markets with envelopment type III, by licensing core technology from partners and bundling them with their own service. While this saved Yahoo costs in terms of research and development it had a major pitfall. It prevented Yahoo from learning and developing competitive technology themselves. This later caused them major difficulties to gain a substantial foothold in these experimental markets. Secondly, Yahoo did not have any strong markets. This created two problems for them. They could not leverage user base and common components from strong markets to experimental markets. Additionally, it made Yahoo rely on their experimental markets to produce profit. Thirdly, Yahoo has lost their core competencies through a too high amount of unrelated envelopment. By relying on third party technology to enter these unrelated markets, Yahoo shifted too much of its focus on services with which to bundle this third party technology, neglecting their own capabilities in software development. These led to the failure of Yahoo's envelopment approach that was based on the envelopment of unrelated markets and resulted in a major strategy change that involved the dropping of a majority of their markets. However, at this point the direct competition from Google was already too strong. With a lack

of core competencies yahoo subsequently grew few core markets and enveloped few markets. It is safe to say, that at this point Yahoo had already lost to Google.

5.2.2 HP's Way of Success

Now that the reasons for Yahoo's failure have been identified, it is to be determined if and how HP avoided these. Firstly, HP also enveloped unrelated markets based on envelopment type III. On the contrary to Yahoo though, HP enveloped these markets with value propositions based on their own technology. This set up HP to learn and further develop their own technology, which in turn improved the competitiveness of their technology. This enabled HP to further penetrate their experimental markets with subsequent value propositions based on the technology used to enter the market. Thus, strengthening their market presence. Secondly, HP did not have strong markets either, which means they also could not leverage user bases and common components. If one however, broadens its scope of analysis, something quickly becomes apparent. While not having strong markets related to their software business. HP did have other business units collecting revenue and profit through the sales of Hardware, such as their personal computer business. This has two major implications. HP did not have to rely on their experimental markets to quickly generate profit. Additionally, HP had capital to invest in research and development for their own technology, which enabled them to envelop unrelated markets with their own technology. An example of this would be HP's envelopment of the personal life style market with 'mscape' in 2007. Thirdly, even though HP had a high amount of unrelated envelopment, they did so based on their core competencies. What is meant by this, is that contrary to Yahoo, HP did not envelop unrelated markets based on third party technology but rather based on their own. Thus, building their envelopment attacks on their core competencies in innovation technology and research & development capabilities. Innovation technology and research & development capabilities have been identified as two of the core competencies of HP (Jafri, Saxena, & Joshi, 2013). This further strengthened the before mentioned core competencies. Subsequently, this enabled them to grow more core markets and envelop more markets.

This by no means discredits the statement by Müller (2015), that Google's envelopment strategy can be seen as a role model path for the ICT industry. It does however, show that it is not necessarily best practice and that there is another feasible envelopment strategy coupled to a set of conditions.

5.2.3 Conditions for an Envelopment Strategy

based on the Envelopment of Unrelated Markets Based on the envelopment path of HP, the following set conditions have been identified for an envelopment strategy characterized by a dispersed value portfolio and the envelopment of unrelated markets i.e. type III envelopment. In order to envelop unrelated markets with the outlook of long term financial success a company has to:

 Enter existing or new unrelated markets based on their own technology. This enables learning trajectories and the development of technology to increase its competitiveness and allows the company to further penetrate the unrelated market with subsequent value propositions. Thus, strengthening market presence. Two advantageous approaches for this are coring and tipping, where coring refers to the creation of new platforms and the latter to tipping a market towards your company's platform.

- 2) Have one or both of the following. A strong market from which it can leverage user base and/or common components. An unrelated business unit from which it can leverage profit to finance research and development and not be reliant on new markets to generate profit.
- 3) At all-time be aware about its core competencies, strengthen and develop them. Furthermore, to envelop its unrelated markets with subsequent value proposition to gradually move to a value portfolio that is characterized by strong market presence.

It is not said that if fulfilled these conditions will guarantee a given company success with an envelopment strategy based on the envelopment of unrelated markets. There is a collection of other factors influencing the success on an envelopment strategy, which have been discussed in section 2. Though, it does show, that an alternative path to that of Google can yield long term financial success. Furthermore, it is expected that this alternative path is a lot less time demanding, because a company does not have to build its core markets for several years on this path, as Google did in theirs.



5.3 The Updated Envelopment Matrix

Exhibit 10: Updated Generic Envelopment Matrix Based on Müller (2015)

The Updated Envelopment Matrix (exhibit 10) illustrates the two identified strategies an ICT platform company can utilize in order to generate long term financial success and possibly achieve supra-platform envelopment. In the subsequent section the two strategies will be explained.

Strategy I is based on the envelopment strategy utilized by Google. It is centered around envelopment type I & II i.e. the envelopment of complementary goods and weak substitutes. In the beginning, this strategy is aimed at creating strong core markets. From these markets the company will later be able to leverage user base and common components. With the core markets producing a substantial amount of profit, new adjacent markets are enveloped. This is done by leveraging markets with strong presence to further expand the core market base by means of type I & II envelopment. An in depth fragmented description of this strategy can be found in Müller (2015, p. 11).

Strategy II is based on the envelopment strategy utilized by HP. It is centered around envelopment type III i.e. the envelopment of unrelated markets. This strategy is characterized by a quick aggressive approach that emphasizes the envelopment of numerous experimental markets via type III envelopment. The guiding principle in this first phase of strategy II is prompt expansion. The cost for this diffusion based expansion are ought to be carried by other business units or other profitable market segments. In this way the company is not dependent on their newly enveloped experimental markets to rapidly generate profit.

With a dispersed market presence and lot of experimental markets, the facing challenge is to gain foothold in these markets. Potential markets are now tried for their suitability towards platforms dynamics e.g. the degree to which the company could capitalize on network externalities and create superior value. This phase is characterized by type I & II envelopment. Experimental markets are further enveloped with complementary goods and weak substitutes, making them to intermediate markets. Simultaneously, markets that are related to the newly enveloped unrelated markets, are enveloped using envelopment type I & II. The guiding principle in this phase is consolidation.

At this point, the company will have gained a distinctive idea which markets are suitable for a platform strategy based on long term success. These markets are now penetrated with a number of subsequent value propositions, i.e. product introductions, based one envelopment type I & II. Thus, strengthening the company's market presence. The guiding principle in this third phase is strengthen. The underlying principle behind this is to establish oneself as the leader of a given platform by market dominance. Following is further expansion of the ecosystem based on envelopment type I & II and the establishment of coalitions, which will accelerate growth. Furthermore, it will enable the company to leverage complementary platforms towards the entrance of adjacent ICT layers with the ultimate goal of supra-platform creation.

6. CONCLUSION

Based on the three envelopment types identified by Eisenmann (2011), two distinctive strategic approaches with the goal of long term financial stability and success have been identified. Categorization and Analysis of HP's new value propositions in the timeframe 2006-2011 revealed insights about the markets HP serves, their market presence in these markets, their degree of dispersion and ultimately their envelopment behavior over time. Plotted against revenue, gross profit and return on capital, a correlation between number of markets enveloped and financial success became apparent. However, this is not assumed to be a general correlation, but one that is highly dependent on the trajectory of a firm's envelopment approach. To validate this, HP's results i.e. the trajectory of their envelopment strategy, has been compared to the findings of Müller (2015), which is considered highly acclaimed in this research circle about the innovation of business models in the ICT platform industry. HP's envelopment trajectory was graphed against those of Yahoo and Google, by the means of the envelopment matrix developed by Müller (2015). The findings evinced two distinctive strategies that lead to long term financial success and sustainable development.

Firstly, the strategy based on the envelopment strategy utilized by Google centered around the envelopment of weak substitutes and complementary goods, as already identified and distinguished by Müller (2015). Secondly, a strategy based on the attempted approach by Yahoo and utilized envelopment strategy by HP. This newly identified envelopment strategy is based on the envelopment of unrelated markets and is, just as the first strategy, able to create long term financial success and sustainable envelopment. However, there is a set of conditions that need to be taken into account and are subsequently summarized in short. A company is required to: 1) Envelop unrelated markets based on their own technology. 2) Be able to leverage capital from other business units/market segments. 3) Work in coherence with its core competencies.

Strategy I, i.e. the strategy based on Google, can be seen and described as a role model strategy for the ICT platform industry. Yet, it can no longer be acknowledged as sole best practice. HP's success with a fundamentally different strategy, strategy II, based on a different kind of envelopment proved its feasibility. However, it is to be taken into account that strategy II is highly resource intensive. It is therefore concluded, that strategy I is best suited for recently founded companies with limited resources and limited access to capital. While strategy II is better suited for conglomerates entering new market segments, as it is expected to lead to long term financial success more rapidly.

7. LIMITATIONS

The chosen research design of a single case study analysis has been subject to a number of criticisms and bears a common set of limitations, that are going to be discussed it this section.

Firstly, single case study analysis often lacks significant methodological rigor. In the case of this paper, this fact can be disregarded as the methodological framework used, is one that has been established in 2015 and is adopted by the whole research circle. Secondly, the most prominent critique of a single case study analysis, is the issue of external validity or generalizability. While the results from this paper alone hold a low generalizability towards the whole ICT platform industry, the comparison with other studies, and ultimately the comparison with the whole research circle will yield high external validity based on a variety case studies. Thirdly, the aspect of researcher subjectivity. In a single case study analysis researcher subjectivity is almost always an issue. Accordingly, researcher subjectivity also threatens the reliability and replicability of this study. Additionally, a last limitation specific to the case company has to be mentioned. Only 240 out of 566 new value propositions from 2006 to 2011 launched by HP have been taken into account in this case study. The financial data these were compared to however, was not corrected for that, as there is no specific financial data of HP's software business. This is a possible threat to the validity of this study.

8. FUTURE RESEARCH

To further improve the generalizability, i.e. external validity, of the results of this paper, this study could be repeated using different case companies.

Furthermore, it would be of high interest to illustrate the envelopment path of other ICT platform companies on the Envelopment Matrix and compare that to the two identified envelopment strategies.

Finally, the future will show companies simultaneously enveloping into each other's markets. The described phenomena are supra platform environments, which will see the erosion of market boundaries. How are companies going to innovate their business model in this new kind of competitive environment? What role will envelopment play in this?

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APPENDIX

Appendix 1:

Software Product Classification by Zahvie & Lavie (2009) "Level of Detail used in Paper: xx (Original xx x)

2 System infrastructure

2 System infrastructure 2.1 Network management (logical) 230 2.2 Network management (physical) 240 2.3 Data structuring, acc. & manipulation 250 2.4 Integrated development environment 275 2.5 Software application design 270 2.6 Software application design 270 2.8 Storage 300 2.9 Security 310 2.10 Distributed computing 320 2.11 Middleware 340

2.11 Middleware 340 2.12 IT system management software 350

4 Business applications 4.1 Enterprise resource planning 555 4.2 Accounting 560 4.3 Factory/facility management 580 4.4 Financial analysis & management 590 4.5 Manufacturing 600 4.6 Sales & marketing 610 4.7 Product design & development 620 4.8 Logistics 630 4.9 Collaborative applications 640 4.10 Human resource management 650 4.11 Data analysis 660 4.12 Decision support systems(DSS) 670

5 Packages 5.1 Integrated development environment 275 5.2 Enterprise resource planning 555 5.3 Office Suite 1700 5.4 Integrated accounting 7900 5.5 Manufacturing resource planning 8600 5.6 Customer relationship management 8800 5.7 Supply chain management 9380 5.8 Human resource management 9700

1 Personal applications

- 1 Personal applications 1.1 Educational/training 110 1.2 Reference 120 1.3 Games 130 1.4 Entertainment 140 1.5 Life style 150 1.6 Personal productivity 160 1.7 Personal multimedia productivity170 1.8 Personal multimedia productivity170 1.9 Business productivity 190 1.10 Utility systems 200 1.11 Operating system enhancements 210 1.21 Internet communications 220

- 3 Vertical applications 3.1 Banking 360 3.2 Government 370 3.3 Healthcare services and medicine 380 3.4 Insurance 390 3.5 Legal 400 3.6 Entertainment and media communications 410 3.7 Real estate 420
- 3.7 Real estate 420

- 3.7 Real estate 420 3.8 Aerospace and aviation 430 3.9 Agriculture and farming 440 3.10 Apparel and fashion 450 3.11 Automotive 460 3.12 E-learning/education 470 3.13 Food service and beverage 480 3.14 Hospitality/travel 490 4.15 Mapping 500

- 3.14 Hospitality/travel 490 3.15 Mapping 500 3.16 Not-for-profit 510 3.17 Telecommunications 520 3.18 Energy/utilities 530 3.19 Retail & wholesale 540 3.20 Science & engineering 550

Appendix 2:

Key Figures for HP

| Company Name | Hewlett-Packard Company |
|--------------------------------|---------------------------|
| Founded | 1939 |
| | Palo Alto, California |
| Founders | William Redington Hewlett |
| | & |
| | David Packard |
| Headquarters | Palo Alto, California |
| Employees 2013 | 317,500 |
| Revenue (in billion US\$) | |
| 2006 | 91.7 |
| 2011 | 127.2 |
| Gross Profit (in billion US\$) | |
| 2006 | 22.2 |
| 2011 | 29.7 |
| Return on Invested | |
| Capital in % (Min. – Max., | 10.7 - 16.8 |
| 2006-20011) | |

Appendix 3:

Elements of the Analysis Scheme

Direct Extract Launch Date Company Product Name Product Type Customer Classification

Appendix 4:

Elements of the Analysis Scheme

Product Launch New Version Launch with Partners Bundling Platform