Master Thesis

How does value-in-use lead to product virality?

Author:	Max Braamhaar
Student number:	S1665898
Education:	Master of Business Administration
Institute:	University of Twente
	School of Management and Governance
	Enschede, the Netherlands
Company:	ActFact B.V.
	Business software
	Enschede, the Netherlands
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Internal Supervisors:	
1st supervisor:	Dr. Wijnhoven
2nd supervisor:	Dr. von Raesfeld-Meijer
External Supervisor:	
Supervisor ActFact:	Sjoerd-Melle van Dijk

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The development of this thesis has taken up to 5 months. I am proud of the results presented in this thesis and I hope the results can be used in further research.

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Max Braamhaar

Management summary

As consumers become more and more demanding, organizations shift from a Goods-Dominant logic towards a Service-Dominant logic. With the Service-Dominant logic, organizations consider the value-in-use of their offerings. The value-in-use of a product is how a consumer experiences the product during consumption. The IT sector is rapidly developing and more focus is on the users rather than on the products. As more organizations are focusing their efforts on offering a superior product, distinguishing a product and finding consumers for a product becomes more challenging. ActFact faces this challenge and to overcome this challenge and reaching more consumers, ActFact can employ viral marketing as a marketing tool. Viral marketing suits ActFact's needs as it has lower costs compared to other marketing methods. Viral marketing implies that a persuasive message is developed by an organization to spread within a network. This thesis tries to combine both concepts and to find out if and how the value-in-use of a software development tool is experienced in the market and how this leads to IT developers recommending the development tool. The main research question answered in this thesis is: *What value-in-use factors have an enhancing influence on a PaaS becoming viral?*

To estimate the most viral aspects of a PaaS, a more in depth research at consumer attitudes towards products has been conducted. This led to the development of a model that measures the value-in-use of consumers, which consists of three main categories: consumers' hedonic motivations, utilitarian motivations and product aspects in regard to their value-in-use. Besides measuring the value-in-use, the impact of the value-in-use with regard to the viral potential of a product has been researched. The research showed that there often is a link between value-in-use and likelihood of recommendation. But, the research showed that some aspects have barely any impact on value-in-use, but do have impact on the likelihood of recommending the product. It has also been found the other way around, that the value-in-use of a certain aspect is deemed very high, but that it has nearly any impact on the likelihood of recommending. This shows that there may be a linkage between value-in-use and viral aspects, but that other factors, such as expectations, buyer-supplier relationship and culture play an important role.

Concerning the hedonic motivations, to increase the value-in-use while using development software the IT developers need to experience more fun, humor, safety and having the ability of social interactions. To increase the likeliness of IT developers recommending the development

software, having humorous elements and the ability of social interactions need to be developed within the PaaS system. Therefore, ActFact should focus their development efforts on creating more fun, which can be done by overcoming small irritations IT developers encounter nowadays. IT developers should experience a more humorous feeling when using the PaaS, which can be achieved by implementing small Easter eggs, hidden features, movie quotes and work related statistics. To increase safety, ActFact should make sure that their PaaS feels safe for the IT developers. As other development tools already have achieved this, ActFact should look at these tools and furthermore develop a way of external testing within the PaaS to overcome a security issue other development tools often face. Lastly, ActFact should introduce more features to give the IT developers a social feeling while working with the PaaS. This can be done by integrating forums and tools such as Skype and TeamViewer in the PaaS.

Concerning the product aspect, to increase their value-in-use while using development software the IT developers prefer to have multiple options to co-create, to have more financial incentives, to have more options to share to product and to have more abilities to customize the software to his/her own preferences. To increase the likelihood to recommend ActFact's PaaS, co-creation, social desirability, financial incentives, network characteristics, share options and customizability all have a big impact. Therefore, ActFact should develop a flawless system in which IT developers can simultaneously co-create. ActFact should introduce some sort of referral marketing which reduces subscription costs to ensure that the financial incentives are optimized. Furthermore, ActFact should develop more options to share the PaaS, it is suggested to develop a very easy way of entering the platform, thus making it easy for IT developers to try the PaaS environment. Besides the ease of entrance, the developed code/applications should be easily shareable. ActFact should make their PaaS customizable in such a way that every IT developer can set it up to his/her own preferences. ActFact should implement network characteristics within their PaaS, this should be done by creating a community.

Concerning the utilitarian motivations, to increase the value-in-use while using development software the IT developers prefer to experience more convenience, to encounter more assistance, the product should be more effective and handier than the current development tools. To increase the likelihood to recommend ActFact's PaaS, the system should focus more on convenience, support options and be more effective than current offerings. To offer a more convenient way of developing, ActFact should focus on developing a test environment which can test with real-time data. The PaaS should have more support options, this could best be

implemented by creating a community or joining an existing community such as Stack Overflow. To increase the effectiveness, the PaaS should make it easier to work with end-user generated errors. To make the PaaS handier than the current offerings, ActFact should develop ways to have relevant and necessary information easily accessible through a dashboard.

Contents

1. Introduction

The evolution of cloud computing is potentially one of the biggest developments within the information technology (IT) sector in the last decade. The development of cloud computing represents a change in the way IT services are developed, deployed, invented, maintained, updated, scaled and paid for. The usage of the term 'cloud' is metaphorical and typically suggests that many usable resources such as hardware and software are accessible through the Internet (Vaquero, 2009; Vouk, 2008). Voas & Zhang (2009) identified that the characteristics of cloud computing are somewhat defined by the existing computing concepts such as grid computing, network computing, utility computing, pervasive computing and service computing. The most notable features of cloud computing are: market-oriented architecture, flexibility, and its ability to charge the customers a fee for the service (Leavitt, 2009). The flexibility of the cloud service can easily be scaled up or down for optimal utilization (Vaquero, 2009). According to Lin and Chen (2012) cloud services are typically provided on the premises of service level agreements (SLAs) and, depending on customer's needs and expectations, can meet varying levels of service criteria.

Cloud services can be categorized in four different service types: Software-as-a-Service (SaaS), a service as an application itself, Platform-as-a-Service (PaaS) and Infrastructure-as-a-Service (IaaS). Even though each of the service types serve different customers and purposes, they share a common business model. The common factor within the services is that they 'rent' the usage of their computing resources including applications, services, software, infrastructure and platforms to customers. This business model shows similarities with the Application Service Provider model (ASP), in which a service provider provides the software, infrastructure, maintenance and people to operate in a customer tailed demand (Wang et al., 2010). The main difference is that an ASP can be offered as an offline service and the different service types are, typically, online services. Furthermore, SaaS and application models can be interpreted as a variation of an ASP, an ASP where the customer has to pay, rent or subscribe to applications or services of cloud providers to use the services, such as online storage via the Internet (Leavitt, 2009). SaaS as well as service models aim to provide customers with issue free operations and allow businesses to free up their IT resources (Pearlson & Saunders, 2009). A more in depth offering of SaaS and applications can be found in PaaS and IaaS. PaaS enables a full or partial platform where developers can develop their own applications and collaborate with others online (Mathur & Nishchal, 2010). The most known PaaS solutions are: Amazon's Simple Storage Solution (S3) and Microsoft Azure Service Platform. IaaS offers even more options than PaaS as it provides customers with hardware that

can be rented as well as a platform. Some IaaS providers deliver a virtual machine to a customer to provide a computing infrastructure via the Internet. The aim of IaaS is to allow IT organizations and software developers to increase or decrease the number of virtual machines depending on the required workload thus promoting efficiency in the use of IT resources. Examples of organizations that offer IaaS solutions are; Amazon's Elastic Compute Cloud (EC2) and Mosso Hosting Cloud. All in all, it is evident that cloud computing is challenging the existing understanding of IT resources. Instead of being fixed products, IT resources are becoming products which can be rented or used as subscriptions from providers and are accessible via the Internet. For this reason, it is argued that cloud computing leads to a computing paradigm shift towards the virtualization of IT provisions and management (Armbrust et al., 2010; Buyya et al., 2008).

Cloud computing represents a convergence of two trends within the IT landscape: efficiency and agility. Efficiency, whereby the power and capabilities of computers is used more efficiently through better scaling hardware and software resources and, the second major trend, business agility, whereby IT can be used as a tool to create competitive advantage. By using cloud computing, a company could decrease its time to introduce a product, application or service to the market which may lead to an advantage over competitors (Kim, 2009).

Besides the developments in IT, the cloud market is predicted to invest more into infrastructure and services related to cloud. The market is expected to grow from 145.2$ billion in 2013 to 235.1$ billion in 2017 (IHS Technology, 2014). Even though the market is developing rapidly and more money is invested, cloud computing does face a series of challenges. One of the foremost challenges cloud computing faces is that companies are not facilitating the transition from classic enterprise IT models to cloud-based computing (Mohammed, Altmann & Hwang, 2009).

Seethamraju (2014) argues that companies are not facilitating the transition from traditional business software systems to cloud computing is due to environmental, technological and organizational factors. He states that: reputation, customer support and service, co-creation of value are key vendor-related factors in the adoption of a cloud system.

To overcome this challenge, a company may want to focus on offering service to its customers. In many cases, businesses observe a transition from the traditional Goods-Dominant (G-D) logic of customer value to the Service-Dominant (S-D) logic (Vargo & Lusch, 2004). They state that the traditional view does not take the 'value-in-use' into account for the customer but focuses on the

goods. Value-in-use implies “a customer’s outcome, purpose or objective that is achieved through service” (Macdonald, Wilson, Martinez & Toossi, 2011, p.671). Value-in-use concerns products and services that can only be assessed by the customers through usage (Vargo & Lusch, 2004). Raja, Bourne, Goffin, Çakkol & Martinez (2013) add that the value-in-use cannot be assessed at the moment of purchase. Value-in-use shares characteristics with experience goods. Klein (1998, p.196) states that experience goods are: “dominated by attributes that cannot be known until purchase and use of the product or for which information search is more costly and/or difficult than direct product experience”. Unlike experience goods, value-in-use can also be perceived in a service offering and can change over time and value-in-use can also be perceived in products that require no information search beforehand (Macdonald et al., 2011). Besides the experience goods, credence goods may also share characteristics with value-in-use, a credence good is a good of which the quality cannot be assessed beforehand and the assessment of value requires additional information (Darby & Karni, 1964). An example given by Darby & Karni (1964) is the claimed advantages of the removal of an appendix, which will be fitting if the organ is diseased. The patient will have no different experience after the operation as a difference might not be felt (Darby & Karni, 1964). Similar to a credence good, the value-in-use cannot be perceived beforehand (Raja et al., 2013), but unlike a credence good, the value-in-use can be perceived afterwards and a customer will experience the value of a product (Vargo & Lusch, 2004; Macdonald et al., 2011). The S-D logic argues that marketing is a continuous process and aims at operant resources. The aim is that organizations continuously create better value propositions than its competitors (Vargo & Lusch, 2004). A value proposition is a process in which different actors collaborate to join in service, with the objective to obtain value (Chandler & Lusch, 2014). Value-in-use is taken into account with this logic. The creation of a fitting value proposition is of great importance, but will not have the desired effect when value-in-use is neglected (Alderson, 1957; Vargo & Lusch, 2004).

The combination of the growing, challenging, cloud market and the shift to S-D logic seems to be interesting to research as the S-D logic might be able to better equip organizations in overcoming the organizational-related challenges that the market possess. ActFact faces this challenge as it is developing a new Platform-as-a-Service (PaaS) system. This PaaS is capable of offering different features than a conventional business software system and would therefore offer an increased value-in-use for the IT developers (S.M. Van Dijk, personal communication, December 2015). ActFact would like its PaaS to replace business development software systems, such as SAP and Oracle, and attract IT developers with it. As ActFact is a small organization, they struggle

with reaching and attracting IT developers for their PaaS. Furthermore, they lack the financial resources to invest in marketing and to promote their product adequately. Thus, ActFact suggests that the most likely way for them to reach and attract IT developers is to make their PaaS go viral among IT developers (S.M. Van Dijk, personal communication, December 2015). With the suggestion from ActFact in mind and the possibilities within the PaaS market it will be relevant to assess the value-in-use for a PaaS software compared to conventional development tools and research how this comparison might influence its aspects to go viral amongst IT developers. This leads to the following research question: *What value-in-use factors have an enhancing influence on a PaaS becoming viral?*

To answer this question a literature review covering value-in-use, viral marketing and word-of-mouth will be conducted. The core domain where contribution will be provided is the value-in-use concept and the viral marketing domain. The empirical study in this thesis will be explorative. The reason for an explorative study is that the value-in-use concept, in itself, is rather new. Fitting the explorative study is the inductive research strategy. In this thesis, interview questions will be used to learn more about the value-in-use for a PaaS system and explore if, how and why IT developers would share a PaaS system. The interviews will be conducted in a semi-structured way. ActFact will serve as a case in this research as it is a producer of a PaaS. Lately, scholars have increasingly been paying interest to the value-in-use concept (e.g. Vargo & Lusch, 2004; Ballantyne & Varey, 2006; Macdonald et al., 2011). Even though the increased interest, the customer value area shows a lack of empirical studies on value-in-use (Macdonald et al., 2011; Raja et al., 2013). Specifically, the area lacks investigation on how buyer satisfaction is influenced by value-in-use in Business-to-Business situations (Raja et al., 2013). When looking at the development of the IT sector, further investigation is very likely to be desirable as the market is changing quickly and developing rapidly. Furthermore, this research will serve as a case in a business-to-business setting as the IT developers will work for organizations that operate in a business-to-business market. In addition, this research also will have relevance for practice. Due to the fast changing cloud computing market, companies should be keen on creating an advantage by maximizing the value-in-use concept and create a PaaS to make customers keener on having their products and more likely to communicate about the product to make it go viral.

This thesis is structured as follows: first, a literature review is conducted on the concepts that will be most valuable for this research: value-in-use, viral marketing and word-of-mouth. Secondly, the method of this research is described in more detail. The method will also include the data collection and the analysis. Thereafter, the empirical research is carried out: Interviews with IT

developers that develop business software within the Netherlands. Then, the results of the empirical research will be presented. Finally, the research finishes with a conclusion in which the key findings, discussions, limitations, practical implications and recommendations for further research will be discussed.

2. Literature review

In this chapter the literature review of this thesis will be covered. First, value-in-use will be covered, then a literature study towards viral marketing will be conducted. Thereafter, word-of-mouth will be covered. Lastly, a more in depth look towards customer' attitudes towards products will be covered and the literature review till be concluded upon with the development of a model.

2.1 Value-in-use

Value is generated by interactions between customers and sellers throughout the relational process and is measured by value-in-use (Kowalkowski, 2011). Value-in-use concerns products and services that only can be judged through its use by the end-user (Vargo & Lusch, 2004), and cannot be judged at the moment of purchase (Raja et al., 2013). Value-in-use entails "a customer's outcome, purpose or objective that is achieved through service" (Macdonald et al, 2011). Barbon, (1903, p.21) states "The Value of all Wares arises from their use". Ballantyne and Vary (2006) argue that the value-in-use concept is based on the mind-set: "things (objects or the conditions produced by actions) cannot have an embedded value," they state that a product or service can only have value to the extent that they meet the customer needs. They further, argue value is assessed in a two stage process, the first stage entails the first exchange, where the first exchange value will be assessed by a customer and thereafter, the products are 'a store of potential value', which assesses the value-in-use is its affirmation (Ballantyne and Vary, 2006). The customer's experience of the value proposition of the vendors and buyers is the value-in-use. Only the companies can build a value proposition, the buyer recognizes the value and is co-producer of this value (Vargo & Lusch, 2004). A value proposition is the overall bundle of products and services a company offers (Osterwalder, Pigneur & Tucci, 2005)

Lemke, Clark and Wilson (2011) acknowledge the relevance and importance of value-in-use for customers in Business-to-Business (B2B) markets. They expect that "value-in-use mediates between customer experience quality and relationship outcomes such as commitment, purchase, retention and word-of-mouth" (p.860).

The value-in-use concept is still a relatively new concept and thus not a lot of empirical studies have been performed. Ostrom et al. (2010), Macdonald et al. (2011) and Raja et al. (2013) stress the importance of the value-in-use concept, but recognize the lack of empirical studies on the concept. At the moment, a few empirical studies have been conducted within the value-in-use concept.

Macdonald et al. (2011) focused on the B2B market and looked at results of the value-in-use concept over time for one company. Raja et al (2013), focused on the key attributes of value-in-use in the B2B market. Kowalkowski (2008) also reckons that companies that use the value-in-use concept are better at recognizing the importance of interactions with customers that go beyond the operational level. They are better equipped to discuss lifecycle costs together and identify value-creation opportunities. Kowalkowski (2011) argues that one of the main challenges of creating value-in-use propositions is the Decision Making Unit (DMU) in which dissimilar roles are present in dissimilar purchase processes. Having a good relationship on the operational-user degree does not guarantee prospective quotes, which do have greater value-creation capability. Michel, Brown and Gallan (2008) note that users are most likely to base a decision on value-in-use while the payer's decision is more related to value-in-exchange. A buyer should try to mediate between these two. Kowalkowski (2011) also argues that value-in-use is idiosyncratic and process-oriented by nature. This holds that sellers have to be aware of the cross functionality of value-in-use and that sellers should not only focus on buying units. When a relationship between a buyer and seller is closer, the seller can emphasize the value-in-use within the value proposition (Kowalkowski, 2011). The buyers may be more attracted with value-in-use as they engage in long-term relationships with sellers. Not all long-term relationships are suitable for a more narrow focus on value-in-use as there might be contractual obligations from either party.

Macdonald et al. (2011) assessed value-in-use in the industrial maintenance sector. They used their conceptual framework and identified the value-in-use for one customer. They assessed the value-in-use in year one (after 12 months of offering) and in year four (after 37 to 48 months of offering). They chose to assess at multiple moments as they estimated that value-in-use may develop in time (Huff, 1990). They found, for example, that efficiency and asset control were the value-in-use for the customers in year one and that retention of competency and continuity of operations were the value-in-use in year four (Macdonald et al, 2011). So, they were correct in assuming that value-in-use may change over time.

Raja et al. (2013) found the “key attributes of value-in-use for integrated products and services” (p. 1131) of a large internationally operating manufacturer. They found that: “knowledge, access, relational dynamic, range of product and service offering, delivery, price and locality” (p. 1135) were the most dominant aspects in the value-in-use concept. Of these seven aspects, they found ‘relation dynamic’ and ‘access’ being the most effective on buyer satisfaction. It is important for a company to be aware of the most important aspects as it can optimize its value proposition. Providers who operate in a competitive environment will benefit if they have the value-in-use expectations of their customers identified (Pires, Dean and Rehman, 2015). They also argue that “value-in-use might be confirmed in the usage phase but must be conceived, at least, when the purchase (exchange) decision takes place” (p. 931).

Concluding, the value-in-use concept is relatively new and more literature is being added the last few years. The literature shows a lack of empirical studies towards the assessment of value-in-use. It is of key importance for companies to measure the value-in-use of their customers. As we see in the previous literature, the concept of value-in-use is well explained, but poorly measured. The difficulty with measuring value-in-use is that it cannot be measured before the customers have the products and a company needs to actively engage with its customers to learn the value-in-use of its products. Yet, many companies try to estimate the potential value of its products while they are not able to fully interpret the value it might have for its customers. As a consequence of having to actively engage with customers, many companies attribute value-in-use to product properties while it can have more value for a customer than just the properties. It might be that when a company is aware of its value-in-use it is more capable of strengthening its value propositions (Vargo & Lusch, 2004; Ballantyne & Varey, 2006; Kowalkowski, 2011; Raja et al., 2013). When a company is aware of its value-in-use and has developed fitting value propositions, they would want to spread their products. An interesting way for a company to spread its products may be by using viral marketing, this will be elaborated on in the next paragraph.

2.2 Viral marketing

Motivating clients to recommend you is the greatest challenge for marketers. Using the advantages that the Internet has to offer, a new way of communicating has submerged. Viral marketing allows and encourages the voluntarily sending of a company’s message by members of the target market in order for the product and or brand to grow. Viral marketing has been defined as: “The promotion of a company or its products and services through a persuasive message designed to spread, typically online, from person to person” (Kirby & Marsden, 2006). It is a marketing phenomenon that allows and encourages the voluntarily communicating of the

message of the target market (Rohrbacher, 2000). The first appearance of the viral marketing was by Steve Jurvetson in 1997. He described the strategy of Hotmail as viral marketing. Hotmail sent, attached at the end of each e-mail, an invitation for recipient to open a Hotmail account. In essence, the users of Hotmail unconsciously became the company's advertisers. This strategy allowed Hotmail to grow from 0 users to 12 million users in 18 months while nearly spending nothing on advertisements (Jurvetson, 2000). A few years later, Google's Gmail used a similar tactic, only referred people can use Gmail, to capture a significant part of the market. Richardson and Domingos (2002) note that viral marketing shares characteristics with word-of-mouth as it uses the customers in a market to promote a product. They state that viral marketing is more cost effective than traditional methods as the customers themselves carry out most of the promotional effort. Viral marketing is strengthened by word-of-mouth as people typically trust and act on recommendations made by people that they know rather than on a promotional message (Richardson & Domingos, 2002).

Howard (2005) defined viral marketing as: "Viral is today's electronic equivalent of old-fashioned word of mouth. It's a marketing strategy that involves creating an online message that's novel or entertaining enough to prompt consumers to pass it on to others spreading the message across the Web like a virus at no cost to the advertiser." Many markets, most notably those associated with any kind of information goods (e.g. software, media, cloud computing, telecommunication etc.), contain strong network externalities (Richardson & Domingos, 2002). Network externalities is defined by Katz & Shapiro (1985) as: 'the utility that a given user derives from the good depends upon the number of other users who are in the same "network" as is he or she.' In essence, network externalities mean that the more users a certain product or service has, the more value the product or service has for existing and new users. Companies should be aware of the importance of relationships between customers in these network externalities as ignoring these may lead to severely sub-optimal marketing plans (Richardson & Domingos, 2002). When strong network effects are present, it is crucial to consider customers' network value besides the customers' intrinsic value (value as a customer based on the product she is likely to purchase). The network value of a consumer is deemed high when he is expected to have a very positive influence on other customers' probability of purchasing (Richardson & Domingos, 2002).

When trying to assess the network value of a customer a company needs information about the relationships between them. The Internet is one of the useful media to find this information as customers might discuss their experiences on review sites, forums, knowledge-sharing web sites, social media and chat rooms. Richardson & Domingos (2002), researched within the "Kids &

Family" product category how much revenue was generated when using normal marketing, direct marketing and viral marketing. They found that when they used viral marketing, the costs of marketing were lower than direct marketing and the revenue was higher. Low marketing costs is one of the greatest advantages of viral marketing. De Pelsmacker & Van Den Bergh (2007) explain that viral marketing encourages the recipients to spread the message further without any other company effort. Another advantage with viral marketing is that when the message sent by a company is fitting, recipients might not perceive it as advertising and be willing to share it which strengthens the effect even more (Kirby & Marsden, 2006). Furthermore, consumers perceive viral marketing campaigns as attractive as the campaigns are non-interruptive, which enables consumers to interact proactively with a communication of a company/brand rather than be positively dictated to (Kirby & Marsden, 2006). One of the disadvantages of viral marketing is that instead of creating a positive reputation regarding the brand/company a negative reputation is created in the market. Recipients may get tired of receiving the same message day after day, either via a website or forwarded by people they know. Some of these situations can be countered. For example, a company specialized in email marketing can avoid that their message reaches the same customer more than once (Goldsmith, 2002). Krishnamurthy (2000), found that another disadvantage of viral marketing can be the loss of control over the message. As soon as the message is spread on the Internet, the control is lost, which may lead to a loss in brand control. Control can also be lost as a group of people a company does not necessarily wants to be associated with, picks the message up and spread it within the group. Moreover, in some cases, the messages sent by companies have been altered or changed to harm the company (Krishnamurthy, 2000). Lastly, viral marketing is hard to measure as a company cannot always keep track who receives the message and acts on it (Krishnamurthy, 2000).

There are two types of viral marketing, active and passive (Subramani & Rajagopalan, 2003). In active viral marketing, the receiver needs to participate. One example of active viral marketing is MSN, a program which let people communicate with each other through instant messaging. MSN needs both persons to install its software to work. A company forces both people to use a product for it to function, which is strengthened by network externalities. In passive viral marketing, customers 'spread' the message when he or she uses the product (Subramani & Rajagopalan, 2003). The example about Hotmail/Gmail given earlier illustrates a passive viral marketing strategy. All in all, viral marketing is about creating the right message to active people sharing the message actively. Within this thesis, the most viral aspects of a PaaS have to be identified and this differs from traditional viral marketing as this focuses a products aspects and attitudes towards a product, rather than a message. Thus, the term product virality has been defined: The

promotion of a company's products and services through a customer driven product development designed to spread the product from person to person. In the next chapter, word-of-mouth will be covered to find out if that adds to the product virality concept.

2.3 Word-of-mouth:

Word-of-mouth (Wom) describes the act of face-to-face communications between people about products and/or companies without commercial intentions. Litvin, Goldsmith & Pan (2008, p. 454) state that Wom is: 'the communication between consumers about a product, service, or a company in which the sources are considered independent of commercial influence'. Arndt (1967, p. 295) defined Wom broader and states that Wom is: 'seeking social support for adoption or non-adoption'. Both statements acknowledge the necessity of Wom which is reducing uncertainty amongst products/companies for customers. Lee & Youn (2009, p. 473) described word-of-mouth as typically being "independent of marketers' selling intents and is thus considered to be more trustworthy and credible".

Besides the conventional word-of-mouth described above, the rise of the Internet has partially shifted the communication to the online world where people can easily talk about their brand, product and company experience on, for example, forums, review websites and social media. This type of communication resulted into a different type of word-of-mouth namely electronic word-of-mouth (eWom). The main difference besides the online aspect is that in offline word-of-mouth, consumers usually know the person with whom they are discussing their experiences, while online, it is easier for complete strangers to discuss about their experiences. In this thesis, we will first look at the conventional word-of-mouth and then at the electronic word-of-mouth.

2.3.1 Conventional word-of-mouth

The importance of word-of-mouth is widely recognized. According to Godes and Mayzlin (2004) word-of-mouth might be the most important and influential way of communicating as an organization and thus outperforms other kinds of communications. This means that it is very important to capture these types of conversations as they can be used to increase value. Katz and Lazarsfeld (1955) conducted a research to the different communications a company can do within grocery shopping. They found that Wom had a stronger impact on brand preference than other sources such as newspapers, magazines and radio commercials. Herr, Kardes and Ki (1991) agreed and found that face-to-face communication is perceived as being more convincing than written down information mostly due to the vividness of the information. Arndt (1967) adds that an effect of positive Wom increases the probability of purchase because the sense of risk

amongst customers reduces. This reduction in risk happens as consumers tend to trust peer consumers more than they do trust marketers (Sen & Lerman, 2007).

As mentioned before, with the rise of the Internet, people do not only talk about their experiences with products in real-life, but they also use the Internet as a source or platform to tell about brand experiences resulting in a different type of Wom, namely eWom, a broader, but unknown, source of information, found online.

2.3.2 Electronic word-of-mouth

The influence of the Internet on marketing has been rapidly developing and becoming more apparent. Deighton and Kornfeld (2009) describe this influence of the Internet as a shift of power in marketing, as the Internet gives the customers more possibilities, interactions and power than ever before. It was predicted that the role of the marketers would become stronger as the Internet gives them more tools to use intrusive direct marketing. Although marketers gained this power, customers gained more power by being able to communicate with companies directly as well as communicate with other customers, meaning that customers are more capable of sharing experiences, preferences and recommendations through the Internet. In the literature different terms have surfaced describing electronic word-of-mouth (eWom), terms such as: 'Internet word of mouth' and 'word of mouse'. Litvin et al. (2008, p. 9) summarized the phenomenon as: 'all informal communications directed at consumers through Internet-based technology related to the usage or characteristics of particular goods and services, or their sellers.' As discussed earlier, word-of-mouth is two or more customers discussing their experiences and preferences in face-to-face communication. Electronic word-of-mouth refers to 'brand-talking' on the Internet, which makes it possible for people to write, discuss and advise other possible customers about their experiences practically everywhere and at every time (Sen & Lerman, 2007). However, reviews on the Internet are usually written anonymously by a person, the possible customers have no relationship with the reviewer and has a so-called 'weak-tie' (Sen & Lerman, 2007; Lee et al., 2009). This change in reviews leads to a newer definition of word-of-mouth. Arndt (1967) and Schiffman & Kanuk (1995) defined word-of-mouth as a form of marketing communication dominated by consumer as the consumer was described as the independent sender of the market. With the introduction of eWom, this definition has altered. Due to the possibilities the Internet offers, companies are capable of interacting while customers are interacting about a product and or company, for example, by promising a discount on the next visit to a spa, if the customers reviews their product or service. Besides interfering between the interacting customers, companies also write reviews of their own about their products to generate a positive

image towards the consumers (Chatterjee, 2001; Werde 2003). This does negatively influence the credibility of reviews as they might not all be from real customers. In these cases it is apparent that the reviewer is not independent of the market anymore as they are influenced by the offering company. To overcome this problem, researches are trying to develop a model to filter company-made reviews (Mukherjee, Liu & Glance, 2012). Being aware of the existence of false reviews, and thus the possible influence of marketers online, combined with the anonymous characteristics of the Internet, it is more challenging for consumers to determine the quality and credibility of electronic word-of-mouth. One way consumers do determine the credibility and quality of reviews is by, for example the reputation of the website, or look at the feedback the review has received from other consumers (Greer, 2003), website features such as design or content, depth of content and site complexity (Flanagin & Metzger, 2007). Brown, Broderick and Lee (2007) researched how suggestions online influence consumers' attitude formation and their decision making. Their research found strong evidence that consumers who act online "behave as if Websites themselves are primary 'actors' in online social networks and that online communities can act as a social proxy for individual identification". Within their research they look at the variables homophily, tie strength and source credibility and how it can help to persuade people online. Homophily differs in the offline world from the online world as it offline describes similarities among people like gender and age (Schacter, 1959; Ruef, Aldrich & Carter, 2003). Online homophily describes equal interests and likewise mind-sets as there is less interpersonal contact (Brown et al., 2007). Nearly the same goes for source credibility where the absence of personal contact exists online as well. Brown et al., (2007) found that source credibility is negatively affected if a site is complex to navigate. Online, tie strength, which refers to the closeness of a social relationship between an information seeker and a source, shows a lack of individual-to-individual ties as the online world is anonymous, the source on the Internet is a stranger. 80% of the respondents described feeling connected to the website instead of to a person (Brown et al., 2007). Bansal & Voyer (2000) found that if a tie is strong, for example between two friends in the offline world, word-of-mouth information will have a significant effect on the receiver's purchase decision online. All in all, word-of-mouth does discuss a few aspects about product virality, but does not hand a guideline for a possible product development. Therefore, a model will be developed to find how a product can go viral by using value-in-use.

2.4 Model development

As the value-in-use concept is relatively new, this thesis aims to provide a different perspective in how to estimate consumers' value-in-use. This is done by looking at consumer' attitudes

towards products and estimate how these play a role in the value-in-use of consumers. To do this, a framework developed by Voss & Spangenberg (2003) is used. They developed a framework by using the dimensions hedonic and utilitarian motivations. These dimensions are defined as followed: *'The first dimension is a hedonic dimension resulting from sensations derived from the experience of using products, and the second is a utilitarian dimension derived from functions performed by products.'* (Voss & Spangenberg, p.310). As value-in-use is perceived through usage of a product (Vargo & Lusch, 2004; Raja et al., 2013), the link between value-in-use, hedonic and utilitarian motivations seems to be evident. Therefore, this research will focus on using the hedonic and utilitarian motivations of consumers to estimate the value-in-use. Voss & Spangenberg (2003) defined variables within both hedonic and utilitarian motivations, they derived these pairs of variables from published research and a pretest of 608 students and professionals. They defined the following pairs of variables for the hedonic and utilitarian motivation:

Hedonic motivation	Utilitarian motivation
Not fun/fun	Effective/ineffective
Dull/exciting	Helpful/unhelpful
Not delightful/delightful	Functional/not functional
Not thrilling/thrilling	Necessary/unnecessary
Enjoyable/unenjoyable	Practical/impractical
Not happy/happy	Beneficial/harmful
Unpleasant/pleasant	Useful/useless
Not playful/playful	Sensible/not sensible
Cheerful/not cheerful	Efficient/inefficient
Amusing/not amusing	Unproductive/productive
Not sensuous/sensuous	Handy/not handy
Not funny/funny	Problem solving/not problem solving

Table 1: hedonic and utilitarian motivation defined by Voss & Spangenberg (2003).

As this research focuses on a B2B setting and tries to estimate the value-in-use and find which aspects may lead to product virality, alterations have been made. Rather than focusing on pairs of motivations, only one motivation has been listed. Some motivations seem to imply the same, motivations such as thrilling and exciting, and, effective, productive and problem solving, seem very similar and have been merged to one motivation. Besides merging motivations, some motivations have been disregarded. Motivations such as sensuous and necessary have been

disregarded as they do not fit a B2B setting or are deemed required. Furthermore, some motivations have been redefined. Motivations such as funny and playful have been merged into humorous as they seem to share the same characteristics. Lastly, a few motivations have been added to complete the hedonic and utilitarian motivation. The added hedonic motivations are: Adventurous, Safety and Social. Adventurous tries to capture how adventurous a customer feels when he uses a product, this differs from exciting as consumers may have a more positive feeling towards adventurous and a rather negative view of exciting. As this research focuses on the IT sector, data security seems very relevant, therefore safety has been added. Social has been added as it captures a different motivation than all the other hedonic motivations described and fits with the variable network externalities and network characteristics described below. The added utilitarian motivations are: Cost saving and Convenience. Cost saving has been added as it may be very relevant in B2B settings for a company when they purchase for a product. Convenience has been added as it is a good addition to the developed model and captures a different motivation.

As this research tries to capture more than the customers' attitudes towards products, product aspects should be taken into account. These product aspects are a key part within the experience while using a product (Barbon, 1903; Vargo & Lusch, 2004; Ballantyne & Vary, 2006; Raja et al., 2013). Product aspects are part of the product itself, the aspects are generalized and should be applicable to all sorts of products. As this model tries to predict product virality, the aspects network externalities and network characteristics have been added. These two variables were found within the viral marketing literature and should be taken into account. Besides these two variables, other aspects of products have to be taken into account. The aspects social desirable, co-creation, financial incentives, share options and customizability have been added as they are relevant to find value-in-use and have not been researched yet. Social desirable was added as it fits the network characteristics and the social motivation. When a product is social desirable, it may be easier to spread within a network. Furthermore, when the network adds value to social characteristics, it may be easier to spread the product amongst possible customers. Co-creation has been actively linked in creating value (Prahalad & Ramaswamy, 2004; Vargo, Maglio & Akaka, 2008; Payne, Storbacka & Frow, 2008; Gronroos, 2011; Seethamraju, 2014). As many researchers have linked co-creation to the creation of value, it may well have vital importance to leading to value-in-use. Financial incentives shares similarities with the cost saving motivation, but may lead to value-in-use from a different perspective. Share options are researched as they may have impact on how the product can go viral, thus by providing a consumer with options to share a product, and it may lead to more viral behavior of a product. Customizability of products

also seems to have drawn the attention of researchers and is linked to creating more value for customers (Tu, Conderembse & Ragu-Nathan, 2001; Jiao & Tseng, 2003; Frank & Keinz, 2009). They find that when a product is customizable towards the consumers' preference more value may be perceived. Therefore, the link between customizability of a product and its value-in-use has to be taken into account. The three main categories, hedonic motivations, product aspects and utilitarian motivations and their variables can be found in Figure 1. This model estimates the value-in-use of the variables and how and if these factors influence the virality of a product. The link between the value-in-use and product virality is new. But, as researchers have researched how emotions such as entertaining, informative, educational, titillating and memorable (Watts, Peretti & Frumin, 2007; Taylor, Strutton & Thompson, 2012; Zernigah & Sohail, 2012) affect the success of viral marketing, the link between the hedonic and utilitarian motivations and the emotions found in viral marketing literature seems evident. To expand on this literature, this study combines both concepts and tries to find how value-in-use influences product virality.

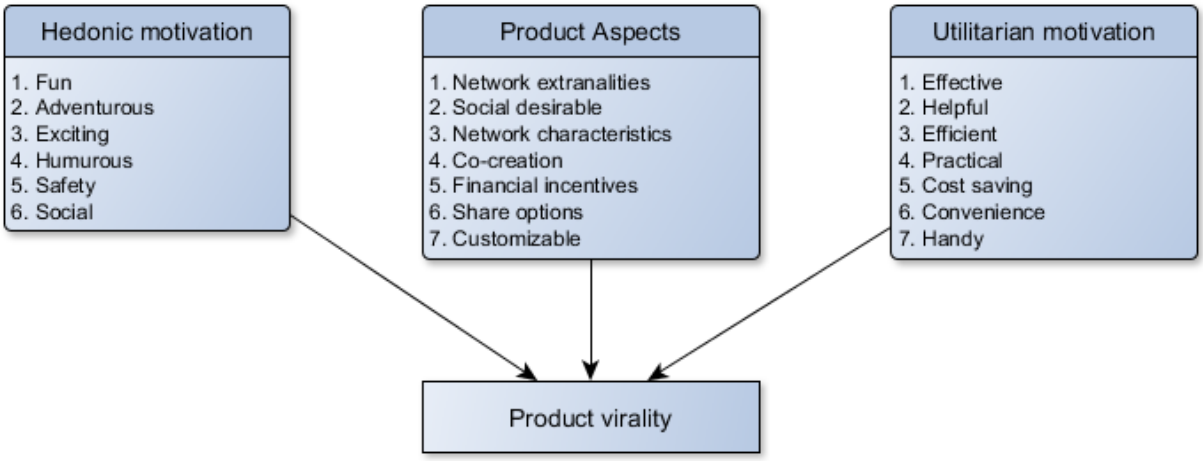

Figure 1. Model for estimating value-in-use and how it may lead to product virality.

Within the three categories, the motivations and products aspects are estimating value-in-use. The motivations and products aspects are defined below.

Hedonic motivation

Fun – How much fun one experiences when using a certain product.
Adventurous – How much adventure one experiences when using a product.
Exciting – How exciting one experiences using a certain product.
Humorous – How much humor one experiences when using a product.

Safety – How much safety one experiences when using a product.
Social – How social one feels when using a product.

Product aspects

Network externalities – "the utility that a given user derives from the good depends upon the number of other users who are in the same "network" as is he or she." (Katz & Shapiro, 1985)
Social desirable – When a product is social desirable in the market.
Network characteristics – When a product can be used to strengthen a person's network.
Co-creation – When a product can be used to co-create (e.g. with other IT developers).
Financial incentives – When a product has financial benefits when it is being used by a person.
Share options – When a product has many options to be shared.
Customizable – Whether a product is customizable as the user desires.

Utilitarian motivation

Effective – How effective a product is for a person who is using it.
Helpful – How helpful a product is for person who is using it.
Efficient – How efficient a product is for a person who is using it.
Practical – How practical a product is for a person who is using it.
Cost saving – How a product can save costs for the person who is using it.
Convenience – How convenient the product is for the person who is using it.
Handy – How handy a product is for a person who is using it.

The literature review showed that the viral marketing concept did not focus on how a product itself can go viral. The aim of this research is to gather data for the developed model and find if and how value-in-use and product virality align. Furthermore, the developed model should be applicable with different products and should be usable later as well to monitor the possible changes in value-in-use and product virality.

3. Methodology

In this chapter the methodology of this research is discussed. First, the research design will be covered, then the case selection will be discussed. After that, the sample will be discussed. Then, there will be explained how the data will be collected. Then, the data analysis will be discussed. After that, the criteria for evaluating qualitative research will be discussed. Lastly, the research context will be discussed.

3.1 Research Design

The research design is based on the literature review which showed that there is little knowledge concerning how to make a product have viral characteristics. This research will try to find how value-in-use can be used to assess the most viral aspects of a PaaS system. To find this, the value-in-use of the model's motivations and products aspects need to be researched. Furthermore, when the value-in-use of the variables is known, there needs to be researched how this value-in-use may possibly influence the likeliness of the product going viral. As this research needs to uncover very specific data, interviews seem most applicable. According to Miles and Huberman (1994) qualitative research has a number of advantages: The researcher has close contact with the field, can "gather data from inside" and "understand, account for, and act on people's behavior". Furthermore, ActFact suggests interviews are more adequate as the data can be sensitive (S.M. van Dijk, personal communication, January 2016).

ActFact will serve as the case in this research. ActFact is a developer of PaaS system. To familiarize myself with the company and product, a number of activities have been carried out:

1. Interviews with directors, employees and advisors of ActFact to familiarize myself with ActFact's methods, products and markets;
2. Describing a list of core aspects of the PaaS;
3. Identifying the target group for interviews

The impact of the model will be estimated within this research to assess which motivations/product aspects have the most impact on the value-in-use of IT developers and how the value-in-use may impact the product virality of a PaaS system. The product virality will be measured by how likely an IT developer is to recommend/share the PaaS system when the value-in-use of development software changes. Based on the data gathered in the empirical research, the relationship between value-in-use and viral marketing is discussed. The outcome may also

give input for further research and development of the value-in-use of ActFact's PaaS. ActFact, and other products, could use a similar research strategy in the future when their product is launched to monitor the value-in-use and improve its product virality.

3.2 Case selection

As ActFact is developing the new PaaS it requires input on how this product can differentiate from its competitors. ActFact is certain that more companies are developing a PaaS system (S.M. Van Dijk, personal communication, December 2015), such as Microsoft's Escher and SalesForce. Thus, ActFact wants its product to appeal more to the market and wants to know how the value-in-use of its PaaS system can motivate the IT developers within the market to choose their product and make the IT developers recommend/share ActFact's PaaS system. To do this, ActFact needs insights on how the value-in-use of the IT developers is perceived when they use a development tool. ActFact needs to know the preferred value-in-use of IT developers to be able to differentiate their PaaS system from the other offerors such as Microsoft and Salesforce. Essentially, ActFact would require the preferred value-in-use of the IT developers of a PaaS which helps them develop, for example, an application for the IT developers' customers. By this development, the current competitors of ActFact, could become ActFact's customers in the future. As the PaaS system wants to appeal to all sorts of IT developers, the research focuses on IT developers of different age, different work experience and different usage of their software. Besides IT developers, an IT consultant is interviewed to verify if a consultant experiences the value-in-use of a PaaS system similar as the IT developers.

3.3 Sample

In total, nine interviews are conducted with ten respondents. Eight of these interviews are conducted with IT developers, IT managers and a Chief Technology Officer. The sample is diverse as the interviewees work in different organizations which develop tailor-made solutions for their specific market in the Netherlands. The IT developers used different ERP systems such as SAP, Oracle, Navision, but also development tools such as Makes, Dias and Eclipse. Besides the usages of different development environments, the IT developers work in organizations who differ in size (expressed in number of employees in total and in the IT department) and different in functions within the organization. The characteristics of the interviewees can be found in table 1. One interview is conducted with an IT consultant to better understand the need of the final users and to understand the more general consensus of organizations that are orientating on different development/ERP software.

IT developer	Contact	Software	Function in organization	Organization market	Number of employees	Number of IT employees	Experience in IT
1	Real life	Compiere	IT developer	IT development market	10	10	> 15 years
2	Real life	Eclipse	IT developer	IT development market	25	15	< 5 years
3	Real life	Navision	IT manager	Energy market	200	10	> 10 years
4	Real life	Navision	IT developer	Energy market	200	10	< 5 years
5	Real life	SAP	IT manager	Cleaning market	10.000	50	> 15 years
6	Real life	Oracle	IT manager	Education	3.000	50	> 15 years
7	Real life	Makes	IT manager	Finance market	200	2	> 10 years
8	Real life	Eclipse	CTO	IT development market	1000	100	> 20 years
9	Skype	Escher	IT Manager	Chemical market	45.000	250	> 10 years
10	Real life	-	IT consultant	Construction market	-	-	> 20 years

Table 2: Characteristics interviewees

3.4. Data collection

In the field of qualitative research, over 30 different methods can be conducted (Cassell & Symon, 2004). As value-in-use might be personal, the preference to interviews is given. Focus groups may have an impact on the views of the interviewees as people may influence one and another. In addition, it might be vital to speak to the 'unit of analysis' directly and notice their body language, as is not the case in an electronic interview. One interview was conducted through Skype, while the other interviews were conducted in real life. As the product virality concept still is in its infancy, this research will be explorative which will have influence on the structure of the interviews. The central question within these interviews will be:

In what way can a newly developed PaaS increase the value-in-use of IT developers and lead to product recommendations?

This is measured by having the following sub-questions answered:

What role do hedonic motivations play in the value-in-use of IT developers in the development tool they currently use, how can this be improved and how do these motivations influence possible recommendations?

What role do product aspects play in the value-in-use of IT developers in the development tool they currently use, how can this be improved and how do these aspects influence possible recommendations?

What role do utilitarian motivations play in the value-in-use of IT developers in the development tool they currently use, how can this be improved and how do these motivations influence possible recommendations?

For example, the questions for the variable humorous are asked as follows:

In what way do you perceive a humorous feeling in your current development tool?

Would you prefer to feel a more humorous feeling in a development tool, and if so, how?

If the development tool gives you a more humorous feeling, how would that influence your willingness to recommending the product?

For the interview template, see Appendix I.

The goal of the research is to find how the PaaS system of ActFact should be developed to increase the value-in-use of IT developers and how this increased value-in-use leads to product recommendations. As this research is explorative, the interviews are semi-structured. The aim of the semi-structured interviews is that the interviewee will have the freedom to freely discuss the concepts to reveal how the interviewee experiences both concepts. To assure that the data collected is reliable, Conway, Jako & Goodman (1995) suggest, by performing a meta-analysis, that the more structured the interview is, the more reliable the outcome. As this research aims to find value-in-use, a completely structured interview is not fitting, as people have more freedom to discuss their experiences in a semi-structured interview. Arvey & Campion (1982) add that to increase reliability, the interviewer's appearance, accents and the candidate's and interviewer's experience can all have a significant impact upon the outcome of the interview. To verify this, a pilot interview was conducted within ActFact to find if the semi-structured interview yields the results it intends to. To ensure that the interviews are valid, the questions within the interviews should be job-related and situational, should have structure and be carried out by one person (McDaniel, Whetzel, Schmidt & Maurer, 1994).

3.5 Data analysis

All interviews are recorded and transcribed. The transcription occurred as soon as possible after the interview as the interview was still a fresh memory. As the data that emerges from unstructured interviews is 'raw data' (Corbin & Strauss, 1990), it will be analyzed by an open coding process and based on the variables mentioned in Figure 1 (see Appendix II for the open coding process). Afterwards, the interviews are read and key-words will be used as codes. These key-words are selected based on the research question, value-in-use theory, viral marketing theory and the list of aspects. In this research three different types of coding are applicable: in vivo coding, summarizing coding and axial coding (Baarda, de Goede & Teunissen, 2013). In vivo coding means that the words which are used in the interview are used as codes. Summarizing coding means that in which a part of the transcribed interviews is summarized into a code. After the conducting of the interviews, the specification phase begins. In this phases the codes will be categorized and codes that are similar will be merged into a category. Baarda et al., (2013) call this process axial coding, for an example of the axial coding process, see Appendix III. After the categories are made, the reduction phase begins, all categories and codes that submerged after this phase are shown in Appendix IV. In this final phase, all non-relevant materials will be eliminated. After the possible elimination, the analysis of the data can begin and conclusions/recommendations can be made. By coding it this way validity is increased (Baarda et al., 2013). Besides the coding process, other ways have been identified to increase validity. Campion, Palmer & Campion (1997) conducted a meta-analysis and found that validity was significantly higher when: the answers of the respondents were rated separately on multiple scales, when interviewers took detailed notes of candidate performance and used rating scales that had clearly defined rating scales, when overall evaluations of the candidates were determined by summing the scores obtained in the interview rather than allowing interviewers determine the overall ratings by their own scores. These measures restrict the impact of human-biases which is favorable for the reliability and validity (Campion et al., 1997). These measures will be taken into account and used to score the interviewees in the data collection.

3.6 Criteria for evaluating qualitative research

As this research is a qualitative study, quantitative methods, such as internal and external reliability and validity, cannot be applied. Guba and Lincoln (1994) have proposed alternative methods to assess qualitative research methods. They propose that qualitative research can be assessed based on trustworthiness and authenticity.

3.6.1 Trustworthiness

To increase credibility, the transcripts of the interviews were sent to the respondents. This gave the respondents the opportunity to check and correct the transcripts. Also, at the end of the research a summary of the findings was sent to all the respondents giving them insights in the findings of the research. Although the respondents have different jobs and work at different organizations, the transferability of the data seems to be applicable to diverse settings.
In order to comply with the dependability of this research, all the steps during the research are described and recorded precisely. If an auditor will check the research, these steps facilitate the auditor to verify the data collection method into the data analysis. To check the confirmability of a study, Bryman & Bell (2011) suggest that the researcher should have acted in good faith. As far as possible, personal opinions and value of the researcher are disregarded in this research.

3.6.2 Authenticity

To maintain authenticity in a qualitative research setting, the sample will be checked. The sample of a research includes to which extent different actors in the market are involved in the research. In this research, different actors are interviewed, IT managers, IT developers, a CTO and an IT consultant. As these actors all have similar characteristics small variation emerges from the sample.

3.7 Research context

ActFact was founded in Enschede, The Netherlands. The company is situated in Enschede and employs nearly up to 10 people. ActFact develops business software and uses a product called Compiere to offer business software to companies. ActFact is developing a new PaaS system to offer their clients a new way of using and developing business software. This research focuses on this new PaaS system.

3.7.1. PaaS system

The PaaS system which is being developed is a system that would enable IT developers to build their application in an online platform and have its users in the same platform, rather than having a stand-alone business software which develops applications. Also, the platform will most likely have some sort of store in which IT developers can buy and sell applications. Furthermore, as ActFact develops the platform, IT developers will not have to worry about the maintenance and keeping the software up-to-date. ActFact thinks that many IT developers eventually spend most of their time on maintenance and bug fixing the core platform rather than developing (S.M. Van Dijk, personal communication, May 2016).

3.7.2 IT developers

IT developers are people that develop any kind of business software. ActFact's platform facilitates IT developer's wishes for less maintenance and bug fixing and tries to offer increased value-in-use compared to other PaaS offerors. Therefore, the IT developers can make more applications for their end users, which may be beneficial as they can increase their service offering for lower prices, thus making it more interesting for end users. The IT developers are capable of offering more value for the end users.

3.7.3 End users

End users are anyone who is in need in some form of business software. As the economy is changing and more and more is becoming digital, the demand from smaller organizations for business software is growing, but as business software systems usually are expensive, IT developers are not capable of facilitating end users in their needs. The development of a PaaS platform should reduce the costs of business software for the smaller end user as investing in more traditional business software options seems to be more costly (S.M. Van Dijk, personal communication, May 2016). The PaaS should also increase the value for end users as IT developers are capable of developing tailor made applications more effectively and for a lower price.

4. Findings

This chapter discusses the findings of the relation between the value-in-use and the product virality.

4.1 How can product virality be understood from a value-in-use perspective?

The central question during the interviews was: *In what way can a newly developed PaaS increase the value-in-use of IT developers and lead to product recommendations?* After the interviews, the interviews were transcribed and the coding process was completed. The codes that emerged from the raw data were put into nine categories. These categories can be found in Table 2 and Appendix IV.

Value-in-use hedonic motivation	Value-in-use product aspects	Value-in-use utilitarian motivation
Recommendations for development hedonic motivation	Recommendations for development product aspects	Recommendations for development utilitarian motivation
Likelihood of recommendation hedonic motivation	Likelihood of recommendation product aspects	Likelihood of recommendation utilitarian motivations

Table 3: Codes emerged from coding process

The IT developers discussed how they experienced value-in-use in their current development software and what could be changed to improve their experienced value-in-use. Aside from the preferred changes in value-in-use they also discussed how development software should be developed and what it should do so that they would recommend the product and therefore create product virality.

4.2 Hedonic motivation

The first category resulting from the coding process is the hedonic motivation of the customer. The hedonic motivation of a customer is a close monitor of a customers' sensations derived from the experience the customer has when using a product (Voss & Spangenberg, 2003). The interviews showed that all customers experienced the hedonic motivations and how it affected their value-in-use. The interviewees also noted how these hedonic motivations can be altered to benefit the value-in-use and the product virality. Most interviewees also gave practical examples of how these hedonic motivations can be influenced to benefit value-in-use and product virality. The list of codes within the hedonic motivations is as followed: fun, adventurous, exciting, humorous, safety and social. Each of these motivators are discussed in depth and practical suggestions are discussed in depth.

4.2.1 Fun

Nine of the interviewees agreed that when they experience more fun using their development tool, they experience a better value-in-use. Six of the ten interviewees concluded that it would be beneficial for their recommendations when they would experience more fun in their development software. The most notable argument for not recommending the software is that development software should be focused on more functional goals and therefore fulfilling the end-users demands rather than the IT developers' personal enjoyment of the product. The following quote describes how an IT developer experiences fun in his value-in-use:

"[…] for me personally, maybe it would, but I would never make a consideration based on my personal enjoyment, that depends on the company I work for."

And when asked about how fun would affect their recommendation for a product:

"[…] No, I do not believe that, the way I look at it, I will recommend software when my personal enjoyment when developing is better than it is now. I really look at functional characteristics of a software tool."

Other IT developers noted that the level of fun does matter, but that it is derived from the enjoyment that end-users have when the product the IT developers develop is fulfilling its expectations. To improve the fun IT developers experience when working with a development tool, small irritations in development programs have to be overcome. A better debugger, faster deployment possibilities and possibly implementing an Artificial Intelligence that studies the behavior of the IT developers and assists on tasks accordingly are specific improvements suggested by the developers to increase the level of fun.

4.2.2 Adventurous

One interviewee has an adventurous feeling when using his development software. Three of the interviewees would like the development software to give them a more adventurous feeling. All these three interviewees also noted that they would recommend the development software when it gives them an adventurous feeling.

The most noted argument against an adventurous feeling is that the development software is used for professional ends. Most interviewees noted that adventurous was associated with risk and risk is not something they would like in their development software. One interviewee described this as follows:

"[…] Well, adventurous goes hand in hand with risk. And risks are not something we are waiting for while developing software." "[…] because you do not want to have this risks in your development tool, it may well earlier work dissatisfying rather than beneficial for a recommendation."

4.2.3 Exciting

None of the interviewees wanted their software development to give an exciting feeling. They all said that the risks they associated with adventurous are even more prevalent with an exciting experience and that when they feel more excited when using a development tool, it will negatively influence their value-in-use and definitely will not encourage them to recommend the product.

Three interviewees stated that they felt a bit excited when using the development software they use as, especially older tools, may have unwanted results. One of the interviewees described this as follows:

"[…] I think everything with business software is related to an excited feeling and especially when looking at the older development software. They deliver an exciting feeling because everything you want to do takes a lot of time and the execution often is not only within your software. So, by letting someone else doing that, you can never be sure of the results."

4.2.4 Humorous

All interviewees acknowledged that the development software they use nowadays is not humorous and does not give them a humorous feeling. But, seven interviewees stated that having more humorous features would increase their value-in-use and that they would be very likely to share the humorous experiences with other IT developers. The other three developers were less keen on having a humorous experience as they believe that development software should only be used for business ends only. One of the interviewees described it as follows:

"[...]I am very serious with my work, I do not enjoy surprises, but when I type a certain line of code and say a plane shows up in my screen that flies through my code for a few seconds, those are funny jokes yes."

And when asked if the jokes would motivate to share the software, the interviewee replied:

"[…] Yes, then I will definitely share it, I consider myself the type that shares a lot. And I can see myself saying, hey, have you seen this? You haven't seen that! Have you? Hahaha."

Other interviewees also referred to similar such as Easter eggs (hidden jokes), quotes of movies and references to stories. They all note that it should be subtle and not a gimmick.

4.2.5 Safety

All interviewees state that safety is one of the most important aspects in their software development. Most interviewees also state that all applications that they work with are safe and they feel that their data is protected from outside attacks. All interviewees say that safety plays a big part in their value-in-use experience, but it rarely plays a role in a possible recommendation. This is because the IT developers expect software to be safe. All interviewees did note that if they would ever try a different software tool and it would have only one incident regarding safety they would never again use that software and negatively speak about it to other IT developers.

One interviewee illustrated a negative experience as followed:

"We have an application that handles vacations and absenteeism. I think the safety of that application is minimalistic and if we could find an application that feels safer, yes, I would recommend that. I would not recommend the application we use to anyone ever."

One interviewee explained how safety issues occur in the current software:

"Sometimes you want to be more in control, certainly when you develop on the web, on certain ports. Sometimes you have develop and test externally rather than internally. Then it would be great if you can be certain that no-one can reach your test environment. That someone types the wrong URL and reaches the test environment that is something that can happen nowadays."

Noticing the importance of safety and how IT developers expect the system to be safe, a completely safe system will be beneficial for the value-in-use, but is not beneficial for the product virality as such.

4.2.6 Social

Six interviewees mentioned that they have a social feeling when they are using their current development tools. They note that they use software to track issues, planning and bugs and that they interact with co-workers to solve problems, to review each other's work and to receive feedback. Eight of the ten interviewees state that they would prefer it if the PaaS system to be more 'social' and they state that it will improve their value-in-use and increase the likelihood to recommend the product. One developer and the consultant stated that did not want to feel more social as they do not like the idea of interacting too much and say that it will drive them away from their work. To make the platform more social, one interviewee said the following:

"[…] Well, look, it depends, if the people I work with are not in my direct surroundings and I cannot ask them to review my code, then a social aspect within the platform is of great value. But when you are working within the same platform and you are sitting next to each other, then its neglicble."

Another interviewee suggested a few features which may be beneficial to the social feeling of a PaaS:

"[…] If the platform would have some sort of TeamViewer, and easy support access, click here to contact me, that sort of thing, all built within the same platform.. Yes, I see possibilities there."

4.3 Product aspects

The second category of the coding process is the product aspects which plays a role in the value-in-use of the IT developers. The interviewees made clear how these product aspects influenced all the IT developers' value-in-use and how these aspects need to be developed in order to create product virality. Furthermore, the interviewees gave practical notions on which product aspects a PaaS system should have developed to ensure they give more recommendations on the product. The list of codes within the products aspect category are: network externalities, social desirable, network characteristics, co-creation, financial incentives, share options, and customizable. Each of these product aspects are discussed in depth.

4.3.1 Network externalities

Katz & Shapiro (1985) defined network externalities as: 'the utility that a given user derives from the good depends upon the number of other users who are in the same "network" as is he or she.' None of the interviewees stated that network externalities added to their value-in-use. The interviewees noted the following:

"[…] I can't think of it this directly. You do not handle it so consciously."

&

"[…] I am not really sure that I would recommend something to make my product value grow."

Five of the interviewees noted that they would recommend the product to make it grow. They state that the product benefits from having more developers and that they indirectly benefit themselves when there are more developers on the same developing tool as they use.

4.3.2 Social desirable

None of the interviewees think that when the PaaS system is social desirable it adds to their value-in-use, they do state that it will be easier to share. Furthermore, all of the interviewees think that they would more likely recommend the PaaS system when it is social desirable. While this may be common sense, one interviewee, who works in the energy business, explained how social desirability can impact the choice of a new ERP system.

"[…] the module that we use is developed for us and cannot be used in different markets. We try, together with other energy organizations in the Netherlands, to work on the same release so that we have a stronger negotiation position with the supplier. To stimulate the price, the supplier is not supplying for 100 people, but for 7000-8000." "[…] when a different energy

organizations want to use the same module and be compliant with our systems, then yes, there is no better reference for that company that other companies in the same business use a certain software. Making it very social desirable and easy to share within our market."

4.3.3 Network characteristics

None of the interviewees work with development software which has network characteristics. One of the interviewees explained this as following:

"[…] I am a member of some communities about support. The Internet made the world so small that you can ask your question to an IT developer on the other side of the planet. Stack exchange, stack overflow, experts exchange, those are all semi-social networks for which you have to pay to be a part off, but they aren't part of the product itself."

Adequately, the software itself does not offer a network for the developers to build, but they try to find such networks if they need support or want someone to assist them. Therefore, there currently is no value-in-use of the network characteristics. Six interviewees state that a PaaS has more value when it has possibilities to grow/maintain the IT developer's network. Furthermore, the same six interviewees would also be more likely to recommend the PaaS if it facilitates these network characteristics.

4.3.4 Co-creation

According to the interviews, co-creation amongst IT developers is something that nowadays happens mostly intern, with co-workers. All interviewees state that being able to co-create software within the same application will increase the value-in-use. They also all agree that, when co-creation is implemented adequately, they would be keener on recommending it to other IT developers. Even though the IT developers agree that they like co-creation a lot, trust in external parties is seen as a boundary.

"[…] I would not really be willing to work with external parties. But, I would prefer to be able to co-create with my colleagues as we can work in the same software in different places."

Some IT developers have experience with developing together with external parties and mention that 'a platform' has benefits:

"Yes. Yes I would co-create with someone who works externally, in fact, we already do that with our current software. But, with a platform, that would be very useful. Especially when it becomes apparent how different components in our software differ in different versions."

One IT developer suggested to implement more co-creation options than just between IT developers:

"Co-creation is definitely an important aspect and more then definitely a reason to recommend. I know, that in my team, when I let multiple people work on one product the quality increases. Then 1+1 is more than 2. I am aware that it costs more hours, but it delivers more value. I would even recommend to allow co-creation between IT developers, graphical designers, user interface designers and such for even more value."

4.3.5 Financial incentives

All interviewees noted that their current development environments do not facilitate financial incentives. They only offer 'incentives' with different level of service packages. Seven interviewees stated that their value-in-use would increase with different financial incentives. Three interviewees noted that financial incentives do not make a difference for their organization, but would when they would use a PaaS system for private purposes. One interviewee gave a detailed idea on how financial incentives may work:

"[…] in this business (software business) it is very hard to start your career. Starters have a difficult time choosing what programming language to learn and develop. You do not learn how to code in packages such as SAP and Oracle in school, and you also do not learn how those packages work if you do not find a job related to them. But, if, I as an experienced IT developer, would be incentivized with like, credits, for helping young IT developers developing their programming wishes, yes, that would appeal to me."

Seven interviewees stated that financial incentives would have a positive impact on their recommendations. Besides the seven who would recommend it, one other responded said that, if it were for his own start-up, he would also be willing to recommend the PaaS because of financial incentives.

4.3.6 Share options

All interviewees reckon that their current software does not have any share options. Six IT developers state that their value-in-use would increase when the PaaS system can easily be shared. They also state that when it is easy to share, they will be more likely to share their applications and developments, thus recommending the product. The interviewees described it as following:

"[…] I would make the promotion of the applications you develop very thorough and easily shareable. Then, when I develop something I can easily share it through communication channels and shows people what I built and how it works. If I, then, would automatically share the platform, I would be okay with that."

"[…] the fact that you do not even have to install anything attracts me. It should be very easy to make a small test environment and the platform should be approachable as a whole. Preferably online with an e-mail or something and send a link to someone who can then just make his own account."

4.3.7 Customizability

Six interviewees state that customizability is an important factor within their value-in-use and for their recommendation. They want to have the freedom to alter their development tools in such a way as they prefer.

"[…] every company has its own process and preferences, and if a development system can facilitate that, yea that works. Customizable to your process."

The other IT developers state that they expect the customizability to be sufficient and that it adds no value for them nor will they use it for a possible recommendation.

"[…] it's not very important in a possible recommendation. It's more important that the platform owner has put thought into the customizable options and that it works. It's useful, but not very essential."

"[…] Customizability is a demand in any development tool, but it's actually common in newer development tools. So, I do not think you can differentiate yourself on customizability from other organizations."

Four of the interviewees also stated that they would not be very keen on giving the end-users the possibilities to customize the applications in any way. None of the interviewees thinks this will benefit their recommendation.

"[…] mark my words, end-users are not capable of doing that. Yes, it needs to be approachable for anyone, so that end-users do not have to wait a year for a new release and see their small fixes, but they should not be able to do those 'fixes' themselves."

4.4 Utilitarian motivation

The third and final category of the coding process is the utilitarian motivation and how those motivations affect the value-in-use of the IT developer. The interviews show how these motivations not only affect value-in-use but also how they influence the product virality. Furthermore, the interviews give guidance in how to practically increase the value-in-use and the product virality when focusing on the utilitarian motivations. The list of codes within the utilitarian motivation category are: effective, helpful, efficient, practical, cost saving, convenience, and handy. All codes are discussed in depth.

4.4.1 Effective

All interviewees state that effectiveness is an important part of their work. The more effective they can develop, the quicker and better applications they can make. They see development software as a tool to facilitate effectiveness. But, they also state that experience plays an important role in how effective an IT developer is.

"[…] I am developing software for more than 15 years and the way I develop now is much more effective than 15 years ago. Then my developing was clumsy and I used less patterns in my developing. That is a skill that depends on experience mostly."

Three of the interviewees, all three being IT manager, state that it would be beneficial for them if the system allows more effective working:

"[...] Yes, 100% yes. With my job, if people can do twice the amount of work in the same time, that is 100% yes. That would make me very happy."

To facilitate an increase in effectiveness one interviewee noted the following:

"[…] when customers run into problems than it can be very effective if the customer can send something like a short movie, or a data dump of the issue, or maybe even view directly what the customer is experiencing. If that would work, then you could develop and correct way more effective than you can now."

Eight of the interviewees state that they would be more likely to recommend the product when it is more effective for their usage.

4.4.2 Helpful

All interviewees state that nowadays most support is found through Google, communities, or through service packages. Some of the interviewees use Internet fora such as Stack overflow

for their support questions. All interviewees state that it is important to receive quick and correct support when they require it. One interviewee, who uses Oracle and has their most expensive support package, said the following:

"[…] we have gold level contracts, which mean that we have 24/7 around the globe support, but even those are not fulfilling our demands. Even then we receive answers such as: have you upgraded to the latest version? When those upgrades are impossible to implement in such a big organization as ourselves. The support is really bad."

Responses as such are more common and show why other communities such as Stack overflow are big and growing. IT developers around the world face similar problems with similar systems and help each other. Eight interviewees state that the support can and should be better and that it will increase their value-in-use and likelihood of recommending the system. As to how to make support better interviewees said the following:

"[…] it would be great if the platform is designed in such a way that every user can use it and that it can ask help from other users when needed."

"[…] some sort of documentation would be greatly appreciated, but is hard to develop. It may even be possible that IT developers themselves write the tutorials and earn credits for sharing them."

"[…] Consultancy always works, in many of the existing networks you have a soft reward for assisting developers. The soft reward is just a sense of honor, someone who asks me for help with their problem. Yes, that is recognition I would like to receive. Besides the recognition, it may also make myself more intelligent, or at least, increase my knowledge."

Thus, a community of sorts, where developers can ask each other for support seems viable and will increase the value-in-use and lead to more product virality.

4.4.3 Efficient

Three interviewees think that a more efficient system would add to their value-in-use. The others state that they do not really think software can be more efficient and it is more about the developers' skills rather than the software. Thus, only three of the IT developers would be more likely to recommend the software when it is more efficient. One interviewee noted the following about working with an online development tool:

"[…] if a system, that is installed locally, is not capable of compiling quicker than the one we use now, how can a system that works online be quicker than one of our super computers? The Internet delay alone would already make it less efficient."

4.4.4 Practical

Six interviewees state that the development software they use feels practical. The say that it feels practical because they can alter settings and interfaces as they prefer. Only three interviewees state that their value would increase when it becomes more practical. One interviewee said:

"[…] we use Oracle and to replace it in our organization would cost around 30 million euro. So it is a lot cheaper to build an application for it to improve it in a practical way. But, the more applications you build around Oracle, the harder it is to replace. We are completely sold to Oracle and we will never replace it. It is horrendous."

Four interviewees think that making a development tool more practical increases the likelihood of recommending. One interviewee gave a practical idea on how to make a development software more practical:

"[…] when developing an application, it would be smart to introduce recognition point such as the hamburger menu with the three dashes. Everyone knows that menu. A menu like that is called a control. The owner of the platform should make sure that the last set of controls are available within the platform."

4.4.5 Cost saving

Five interviewees did not really pay attention towards the price of the development tool. One, for example, stated:

"[…] No, saving costs does not play a role. If we find a good tool, then we do not really look at price. The price is rarely the bottleneck. We buy systems on functionality and added value for us, not on price."

The five interviewees that did not focus on price worked with bigger software packages such as SAP/Oracle in bigger organizations. They did say the following:

"[…] I can imagine it will make a difference for smaller organizations, but not for an organization of our size."

This seems true, as the other five interviewees that state that cost savings influences their value-in-use and recommendation, work in smaller organizations. They think saving costs by choosing a different package is just as vital as functionality. In the end, saving costs, to increase value-in-use and product virality would be mostly relevant for smaller organizations, but not as important for bigger organizations.

4.4.6 Convenience

Convenience in the usage of development software is rather low, mostly because many of the system are old and slowly develop. All interviewees state that convenience can be improved a lot. As convenience increases, the value-in-use will increase which will have a positive impact on the possible recommendation made by IT developers. The developers have a few suggestions to increase the convenience of the development software:

"[…] if you could test your developed product against real-time data without altering the real-time data, that would be very beneficial. As you can show your customers exactly what you are doing on data that is relevant at this moment, rather than with older data."

One IT developer noted that the convenience should not be too great as he feels that it might make 'real' IT developers unnecessary.

"[…] it should not be too easy, if a business analyst is capable of building applications within the platform, then I do not need any IT developers anymore. But then I would miss a group of people who are capable of doing a lot more than building a small application. So yes, more convenient is great, but do not make it too convenient."

4.4.7 Handy

Seven interviewees state that the value-in-use can be increased by making the development software handier. Furthermore, six of these seven are more likely to recommend it because it is handier. One of the interviewees described the current situation as follows:

"[…] I will be honest with you, the first time that I saw our ERP system. I had never seen such a user unfriendly system. There is not one feature you could even consider handy. You learn to work with the system yes, but there are many improvements that may improve our ERP system."

The interviewees also gave a few practical solutions to make development software handier:

"[…] if I want to install a new development environment on a computer, that will take nearly half a day. It would be handy if someone developed a certain environment, it can be deployed on all computers within the organization instantly."

"[…] when you are looking for a website on a phone and you would compare them. And you see that one of the website builder has put in the effort to make the website compatible for your phone. Then, whatever way you look at it, that is handier than the website that is not compatible for your phone. If the PaaS can facilitate that the applications work on all devices and give an overview of all the possible devices it works for, yes, that is really handy."

4.5 Other findings

Concluding this chapter, the other findings are presented. Within the interviews a few of the respondents named limitations in their value-in-use. Two interviewees named that company culture may be a limitation in their adoption of a PaaS system, one said the following:

[…] you should not forget, the company was founded in 1955 and many people in this company are older than 45. These older people just see IT as ballast as a whole. They do not want to change and they are deciding within the firm."

Besides culture, storing data outside company boundaries seems to be a limitation. Three interviewees do not think that their firms will be keen on storing their data on external servers, which the companies do when they use a PaaS. One interviewee described this as follows:

"[…] within our firm, it is company policy to keep the servers intern. I am aware that there have been major developments within data security in the last five years, but we still are dealing with sensitive consumer data and we cannot afford it to have such vital data compromised."

5. Conclusions and discussion

This is the final chapter of this thesis. First, there is a conclusion based on the findings of this thesis. Then the central research question is answered based on the findings of this thesis. Thereafter, the discussion of the findings in comparison to the literature is discussed. Thirdly, the limitations of this thesis are discussed. Thereafter, the recommendations for further research are discussed. To finalize this section, the practical implementations are presented, which may offer a guidance for the management of ActFact.

5.1 Conclusion

Within markets, shifts from the G-D logic to the S-D logic can be observed. The cloud computing sector shows a similar trend. Central to the S-D logic lies the value-in-use concept. This research focuses on this, new, understudied concept. It was attempted to learn more about this subject and see how it influences a product going viral.

The central research question addressed in this research is: "*How can a PaaS monitor and improve its value-in-use to find its most viral aspects?"*

This question tries to combine the value-in-use concept with viral marketing. The literature review showed that the viral marketing concept lacked clear guidance on how to make a product go viral. Therefore, this research linked the value-in-use concept with the viral marketing concept by finding 'common ground'. Value-in-use is a process in which the IT developers uses a product and then can judge the value of the product. Value-in-use is about experiences, attitudes, feelings and thoughts about a product. On the other hand, viral marketing is keen on spreading its message and tries to reach influential persons within a targeted network. The messages typically are designed to make the target group feel certain emotions, such as entertained, informed, and humored.

By combining both concepts, the focus shifted to consumer attitudes towards products. As most behaviors and experiences are formed after purchase, which links with value-in-use, and a developed attitude may lead to a consumer recommending a product, thus making it go viral within the customer's network. Therefore, this research addresses how an IT developer should experience the value-in-use of a PaaS system to be willing to recommend the product to other IT developers.

To assess how the IT developers experience value-in-use, the hedonic motivation, utilitarian motivation and product aspects, based of Voss & Spangenberg's (2003) framework and the literature review, have been researched in the interviews. The developed model deemed applicable for finding the value-in-use for IT developers and predicts how the PaaS system should be developed to be most likely recommended when IT developers use it. This framework should also be applicable to other research settings.

The findings on hedonic motivations show that developing a system that offers the IT developers more of a fun experience, a system that offers subtle humorous jokes, a safe system and a system that offers more social interactions is a system that leads to increased value-in-use. The value-in-use for IT developers will decrease when the PaaS system gives an exciting

and/or adventurous feeling. IT developers associate the exciting and adventurous feelings both with risks and they do not want to experience risks in their development software. To increase the product virality, a PaaS system which gives IT developers a humorous feeling and which has more social interactions seem to have the strongest impact. Even though safety has a strong impact on the value-in-use, it has no impact on potentially sharing the product. This is because the interviewees expect the software to be safe. Also, the exciting and adventurous feelings have a negative effect on the likelihood of recommending the PaaS system.

The findings on the product aspects show that the PaaS system should focus on developing co-creation options, financial incentives, share options and customizable to increase the value-in-use for the IT developers. The experienced value-in-use will not change when the PaaS system is social desirable or because of network externalities. No negative effects on value-in-use have been observed within product aspects. To improve product virality, co-creation, social desirability, financial incentives, network characteristics and sharing options have the strongest impact. Especially the social desirability stands out, while it has no impact on value-in-use, it has a strong impact on product virality. This may be explained as the boundaries on sharing may be extremely low when a product is social desirable. The variables that have the least impact on product virality are customizability and network externalities.

The findings on the utilitarian motivations show that, to increase the value-in-use, the PaaS development should focus on developing more convenience, should offer more support options, should be more effective and handier than the current software offerings. If the PaaS software saves the IT developers costs, or if it is more practical than the current offerings, this seems to have a lower impact on the value-in-use. To improve the PaaS system's virality, development efforts should focus on convenience, helpfulness and effectiveness. By optimizing those, the odds of IT developers recommending/sharing the PaaS system increases. The least impact on product virality are cost savings, practicality and handiness. While these do add to the product virality, they have less impact than the other variables.

5.2 Discussion

The interviews made clear that IT developers, while sharing similar characteristics, experience value-in-use and product virality differently. The different responses were categorized to make it easier to compare the interviews. Found was that, besides the value-in-use and product virality, culture may play an important role within the companies. Some companies were less likely to adapt to a new development system as the employees and the DMU may be not ready for

changing development tools. The relationship with the supplier seems to be vital for bigger organizations to overcome this change. As Kowalkowski (2011) states, a good relationship on the operational-user degree does not guarantee prospective quotes. Besides value-in-use, the viral marketing concept usually focuses on a ‘persuasive message’. This research did not focus on a message but rather on how to develop a product that has viral characteristics of itself based on customer attitudes. A message would be a commercial or a video which is normally shared with viral marketing.

The research also encountered a few boundary conditions. These conditions, circumstances and/or incidents have to be taken into account when developing a value proposition for the PaaS system. As noted before, cultural circumstances have to be taken into account when to approach organizations with this rather new way of developing software. Besides the cultural boundaries, company boundaries also play a role. As a PaaS system is a cloud based system, companies will need to store their data online rather than in their own servers. In the interviews, multiple IT developers stated that they felt uncomfortable storing personal data, such as wages, pension and address records in the cloud. Furthermore, as many established organizations already have forms of IT implemented within their organization, it can be hard to implement with existing software, due to vendor lock-in, or, might even be unwanted due to a customer-supplier relationship the organization already has. These boundaries have to be taken into account when developing value propositions for organizations. And, that even when the product offers superior value-in-use and IT developers want to recommend it to other people in their network, it can be that the willingness to implement a different system can be very low.

5.3 Limitations

As nearly in all empirical studies, this study also has a few limitations. First off all, as in all qualitative studies, this study is hard to generalize to the population as only a small sample of the population is researched. Within this study, IT developers of different organizations, with different characteristics were interviewed but, no end-users (customers of the IT developers) were interviewed. When creating a system, it, of course, is beneficial to increase the value-in-use for the IT developers, but the end-users, the users that use the applications developed by the IT developers, rather than developing them, should not be disregarded in this matter. Secondly, as the PaaS system is still being developed, the questions were more subjective than one might prefer. Due to this, the interviewees were not able to try a product and experience the value-in-use, but rather discuss how they would like an ideal system to be. Thirdly, the DMU within an organization plays a big role in the decision process of which development tool to

purchase. It may occur that the IT developer would like to implement the PaaS system while the decision makers decide differently. Fourthly, as this research tries to combine the viral market concept and value-in-use concept with customer attitudes, it enters new terrain. Due to this, there is no complementary literature to back up the findings and recommendations. Fifthly, due to the method in this research, the sample is not that diverse as desired. Only IT developers situated in the Netherlands were interviewed. Thus, results may not be applicable in different countries. Sixthly, no research has been conducted to find the most influential persons within a network. Lastly, due to the nature of this thesis, it was not possible to conduct the research again, as did the research of Macdonald et al. (2011). So it was not possible to see how the value-in-use develops over time, the model does imply that it can be used to measure changes in value-in-use and its influence on the product virality over time. According to Prahalad and Hamel (1994), the expectations and perceptions of buyer's may alter over time, as also was found by Macdonald et al. (2011), strengthening the importance of testing the model more than once. The above mentioned limitations may be interesting to look into in future research.

5.4 Recommendations for future research

A wider research may be advisable to conduct and more IT developers should be interviewed. Furthermore, a different approach towards this study could be that the same study can be conducted focused on end-users to find their value-in-use preferences and how/when they would recommend a PaaS system. When the focus is on the end-user, they would push the IT developers to use the system, rather than the IT developers bring the end-users. Thirdly, the DMU of companies have not been taken into account while they do influence the possible adaption of a new system. Fourthly, it is interesting to see how the value-in-use and how it affects recommendations develop over time, certainly when the PaaS system is launched and being used by IT developers. Lastly, the model has been developed to test the value-in-use and most viral aspects for multiple products. Thus, testing the model in a different research setting with different specifications is recommended for future research.

5.5 Practical recommendations

This thesis has given us a lot of insights about the value-in-use concept and how it links to product virality. In this part, theoretical recommendations will be given on how to implement the findings to develop a PaaS system that has an increased value-in-use for IT developers and makes them most likely to recommend the PaaS system when they are using it. As the model introduced three different categories, the recommendations will be categorized accordingly.

For the hedonic motivations, it is recommended to focus development efforts on:

- Creating a more fun experience for the IT developers while they are developing. This can be achieved by overcoming small irritations IT developers encounter. It might even be worthwhile to implement an artificial intelligence tool that measures were IT developers struggle and give ActFact feedback to develop accordingly.
- Developing a humorous environment. IT developers seem interested in having humor elements within the software itself. The humor should be unexpected and unobtrusive. Finding small movie quotes, referring to key features, in a fun way may warrant a greater value-in-use and will definitely lead to more recommendations as IT developers are very keen on sharing something they consider funny. Besides the humorous features, statistics have been named in the same sense, examples like, how many rules of code have I typed yesterday, or how many bugs have I squashed last week, seem very beneficial for the fun and humorous aspects within hedonic motivations of IT developers.
- The interviewees named the need for a more social experience to be beneficial for their value-in-use and their likelihood of recommending. To adhere to this in a development manner, it may be wise to create a community around the platform. It is advised to integrate this with existing communities such as Stack overflow and Experts Exchange. Besides the community, interaction possibilities such as a chat box, Skype calls, WhatsApp and the integration of TeamViewer seems beneficial as it would make it more likely that IT developers communicate with each other.
- The safety aspect is a very important factor for the value-in-use of IT developers. Development efforts should ensure that this aspect is at least on par with other software development tools as, when it is less than other development tools, it will ensure that the IT developers will leave the PaaS system and negatively communicate about it. If the safety is better developed than other systems, it will not directly lead to more recommendations as the IT developers expect it to be safe and their data to be protected the best way possible. A possible way safety could be improved is that when an IT developer is testing its application online, it has to create a website that accidentally can be accessed by a third party. By keeping such a test environment enclosed within the PaaS system and making it inaccessible for anyone else, this safety threat is dealt with.
- The PaaS environment should not have an adventurous and/or exciting feeling. This feeling will, naturally, occur the adoption stages of the IT developers, which is deemed acceptable by the interviewees as they experience something new and find it intriguing.

But, that feeling should not stay a constant factor as they keep on using the PaaS system as both feelings are linked to risks. And, as the safety factor already implied, risks are unwanted within a development tool. Development should ensure that the IT developers do not feel an exciting/adventurous feeling when they are using the PaaS development tool. This may be facilitated by the introduction of tools the IT developers are known with, such as the hamburger menu, or toolbars similar to which other development tools use.

For the product aspects, it is recommended to focus development efforts on the following aspects:

- Co-creation options should be developed very well, as this is one of the strongest influencers of value-in-use and product recommendations. To develop this correctly, a set of variables should be combined. The social aspect of the platform should be flawless as the co-creators might need to communicate while using the platform. The safety of the co-created applications should be guaranteed and legally protected. And the development process itself should be convenient in such a way that the co-creators find no hindrance of each other in the development process. For the legal safeguards and increase in safety, it is advised to hire a person who knows about online data protection to create terms of service that cover the rights of co-created applications. Besides the legal safe guards, it is advised to actively develop communication tools and develop a convenient way of having multiple developers work in the same application at the same time. It might be wise to look at examples such as Google Docs that share similarities by working on the same documents, in real-time, online.
- Financial incentives seem to be more relevant for smaller organizations. To increase the value-in-use, financial incentives, to an extent, should be integrated in the software. The interviewees stated that they would prefer some sort of consultancy option within the PaaS but that the recognition of some asking for your expert opinion is a reward in itself. Besides this, it is advised to have some sort of referral marketing, so that when an IT developer recommends the product he or she is rewarded in a fitting manner. The most fitting manner seems to be a reduction in subscription costs but also a ‘soft reward’ such a community rank/badge may be worthwhile to give to people who actively recommend the software. It is also advised to incentivize developers for helping/recommending/paying to have their applications promoted within the platform itself.

- Share options seem to be rather impactful on the value-in-use and the willingness to recommend. To facilitate this, development efforts should focus on making it very easy for new IT developers to enter the platform. So easy that they can join with an easy sign-up through e-mail. In the early stages, it is advised to make the platform free of charge for a brief period, e.g. a trial month. This is advised to make the entry barriers very low and have IT developers try out the platform. Besides the low entry barriers, the applications, questions and codes should easily be shareable. An IT developer should be able to demo its application to others very easily. Furthermore, if an IT developer runs into any issues, it should be relatively easy to ask support on the subject within the community. Lastly, it is advised that an IT developer can share its lines of code, or developed applications easily within the platform, either for access and support, or by selling them to other developers.
- By making the platform functionally customizable to the IT developers' wishes, the value-in-use will increase. This is as every IT developer has his or her own preferences in development. For example, the bar with quick access should be customizable in such a way that every IT developer can change it to its own liking.
- Network characteristics seems to have a strong impact on the likelihood of recommending, by adhering to the social demands and creating a community, IT developers can meet and expand their existing network. The introduction of a community in combination with co-creation ensures strong network characteristics which lead to more recommendations of IT developers.

For the utilitarian motivations, it is recommended to focus development efforts on:

- As a recommendation on the utilitarian motivation, developing a more convenient development environment stands out the most. Developing a more convenient way of software development leads to increased value-in-use and increased likelihood of recommending. To make the software more convenient than others, it is advised to focus development efforts on trying to make it possible to have a test environment test with real-time data rather than with older data. It is also advised to implement a way of tracking the errors and bugs an end-user encounters. By automatically adding a string of data, or a data log of what the end-users did when they encountered the error/bug will greatly increase the response speed of the IT developers to solve the errors.
- Besides the added convenience, the PaaS should have more extensive, responsive and accurate support. To achieve this, the community that surrounds the PaaS needs to be

implemented well. As IT developers usually require a quick answer on their questions, the community could be very well capable of offering this quicker than a support offering ActFact has, can. Besides the community, some sort of, ask an expert option should be implemented. IT developers can help each other by marking themselves as experts. Incentives, soft, in the form of reputation and recognition or feasible, such as monetary compensations should be implemented to increase the likelihood of people offering to mark themselves as experts. By implementing these two factors correctly and offering a good support/service as a PaaS host, the value-in-use and willingness to recommend of IT developers increases.

- When the product is deemed more effective than the current offerings, IT developers will experience more value-in-use and are more willing to recommend the PaaS system. To increase effectiveness, it is wise to develop easier ways of working with end-user reported errors. Furthermore, it is advised to make the development language within the platform the same as an existing language to make IT developers that are already more capable of using their experience within that language within the platform.
- The PaaS system should be handier than the business software development tools nowadays. To achieve this it is advised to develop easy ways of having the necessary information available. Develop customizable dashboards, easy access to data, a good function bug tracker, a tool that shows on which devices the developed app is displayed well and an easy way to copy settings of one user to other users so that an organization works with the same settings within the platform are all ways that can increase the handiness of the platform, which in turn leads to an increased value-in-use for IT developers.

Important challenges not to forget:

- Within organizations, cultural barriers may exist when adopting a new system. People are having difficulties in using IT products. By introducing a new system that operates in the cloud, barriers to change, fear of data off site and data migration processes may be challenging.
- As this research is based upon a product that has not yet been developed, differences may occur when IT developers will use a PaaS system. The IT developers described how they would prefer to see such a system, but it might be hard to develop it exactly as they envision.

- The value-in-use concept has to be translated to value propositions to be feasible for the customers. The value propositions should be built on the value-in-use, but should not forget the competitors. The value proposition should stand out in the market.
- As this research did not look at the DMU, the value propositions may need to be tailor-made for the decision makers, rather than the IT developers.
- As this research focuses on IT developers, the end-users of the product are paid little regard to. It may be that end-users play a very big role in the decision which IT system to use and their value-in-use may differ a lot from the value-in-use of IT developers.
- Many organizations that already have some sort of business software may have a relationship with their supplier. These relationships may hinder organizations in adopting a new business software development tool.

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Appendix I Interview questions

1. After explaining PaaS system: Do you think there is a demand for a PaaS system?
2. Have you ever recommended the current development software you use? And why/why not?
3. How do you currently experience <variable> in your software?
4. What could be improved for <variable>?
5. If this is improved, would you then be more likely to recommend the whole PaaS to other IT developers? Why/why not?
6. After all variables have been discussed: Which variables do you consider the most important for the development of the platform?
7. Do you have any suggestions for the development of the platform?

The variables can be replaced with any of the variables mentioned in the table below.

Hedonic motivation	**Product aspects**	**Utilitarian motivation**
Adventurous	Network externalities	Effective
Exciting	Social desirable	Helpful
Fun	Network characteristics	Efficient
Humorous	Co-creation	Practical
Safety	Financial incentives	Cost saving
Social	Share options	Convenience
	Customizable	Handy

Appendix II Open coding process

Codes found through the open coding process:

1. Recommendation business software now
2. Likelihood to recommend
3. Preferred way of paying for business software
4. Likeliness to consume applications developed by others
5. Likeliness to developed applications to sell to others
6. Likeliness to develop code to sell to others
7. Suggestions for development platform
8. Views on storing data in cloud
9. Culture
10. General need for a PaaS system

The other codes were based on the model:

1. Value-in-use adventurous now
2. Recommendations for development adventurous
3. Likelihood of recommending adventurous
4. Value-in-use now exciting
5. Recommendations for development exciting
6. Likelihood of recommending exciting
7. Value-in-use now fun
8. Recommendations for development fun
9. Likelihood of recommending fun
10. Value-in-use now humorous
11. Recommendations for development humorous
12. Likelihood of recommending humorous
13. Value-in-use now safety
14. Recommendations for development safety
15. Likelihood of recommending safety
16. Value-in-use now social
17. Recommendations for development social
18. Likelihood of recommending social
19. Value-in-use now network externalities

20. Recommendations for development network externalities
21. Likelihood of recommending network externalities
22. Value-in-use now social desirable
23. Recommendations for development social desirable
24. Likelihood of recommending social desirable
25. Value-in-use now network characteristics
26. Recommendations for development network characteristics
27. Likelihood of recommending network characteristics
28. Value-in-use now co-creation
29. Recommendations for development co-creation
30. Likelihood of recommending co-creation
31. Value-in-use now financial incentives
32. Recommendations for development financial incentives
33. Likelihood of recommending financial incentives
34. Value-in-use now share options
35. Recommendations for development share options
36. Likelihood of recommending share options
37. Value-in-use now customizable
38. Recommendations for development customizable
39. Likelihood of recommending customizable
40. Value-in-use now effective
41. Recommendations for development effective
42. Likelihood of recommending effective
43. Value-in-use now helpful
44. Recommendations for development helpful
45. Likelihood of recommending helpful
46. Value-in-use now efficient
47. Recommendations for development efficient
48. Likelihood of recommending efficient
49. Value-in-use now practical
50. Recommendations for development practical
51. Likelihood of recommending practical
52. Value-in-use now cost saving
53. Recommendations for development cost saving

54. Likelihood of recommending cost saving
55. Value-in-use now cost convenience
56. Recommendations for development convenience
57. Likelihood of recommending convenience
58. Value-in-use now handy
59. Recommendations for development handy
60. Likelihood of recommending handy

These codes are obtained from the 1st interview with an IT developer.

Appendix III Axial coding process

Codes without category:

Recommendation business software now	Likeliness to develop code to sell to others
Likelihood to recommend	Suggestions for development platform
Preferred way of paying for business software	Views on storing data in cloud
Likeliness to consume applications developed by others	Culture
Likeliness to developed applications to sell to others	General need for a PaaS system

Codes associated with hedonic motivation:

Value-in-use adventurous now	Recommendations for development adventurous	Likelihood of recommending adventurous
Value-in-use now exciting	Recommendations for development exciting	Likelihood of recommending exciting
Value-in-use now fun	Recommendations for development fun	Likelihood of recommending fun
Value-in-use now humorous	Recommendations for development humorous	Likelihood of recommending humorous
Value-in-use now safety	Recommendations for development safety	Likelihood of recommending safety
Value-in-use now social	Recommendations for development social	Likelihood of recommending social

Codes associated with product aspects:

Value-in-use now network externalities	Recommendations for development network externalities	Likelihood of recommending network externalities
Value-in-use now social desirable	Recommendations for development social desirable	Likelihood of recommending social desirable

Value-in-use now network characteristics	Recommendations for development network characteristics	Likelihood of recommending network characteristics
Value-in-use now co-creation	Recommendations for development co-creation	Likelihood of recommending co-creation
Value-in-use now financial incentives	Recommendations for development financial incentives	Likelihood of recommending financial incentives
Value-in-use now share options	Recommendations for development share options	Likelihood of recommending share options
Value-in-use now customizable	Recommendations for development customizable	Likelihood of recommending customizable

Codes associated with utilitarian motivations:

Value-in-use now effective	Recommendations for development effective	Likelihood of recommending effective
Value-in-use now helpful	Recommendations for development helpful	Likelihood of recommending helpful
Value-in-use now efficient	Recommendations for development efficient	Likelihood of recommending efficient
Value-in-use now practical	Recommendations for development practical	Likelihood of recommending practical
Value-in-use now cost saving	Recommendations for development cost saving	Likelihood of recommending cost saving
Value-in-use now cost convenience	Recommendations for development convenience	Likelihood of recommending convenience
Value-in-use now handy	Recommendations for development handy	Likelihood of recommending handy

The codes that do not have a color, are not relevant input for the model and have been disregarded during the research.

Appendix IV All categories and codes summarized

The times observed show many times, in positive or negative regard, all interviewees discussed about the matching code.

Category: Value-in-use hedonic motivation

Codes:	Times observed:
Value-in-use adventurous now	10x
Value-in-use now exciting	9x
Value-in-use now fun	10x
Value-in-use now humorous	10x
Value-in-use now safety	10x
Value-in-use now social	10x

Category: Recommendations for development hedonic

Codes:	Times observed:
Recommendations for development adventurous	2x
Recommendations for development exciting	0x
Recommendations for development fun	8x
Recommendations for development humorous	10x
Recommendations for development safety	4x
Recommendations for development social	6x

Category: Likelihood of recommendation hedonic

Codes:	Time observed
Likelihood of recommending adventurous	10x
Likelihood of recommending exciting	7x
Likelihood of recommending fun	8x
Likelihood of recommending humorous	10x

Likelihood of recommending safety	9x
Likelihood of recommending social	10x

Category: Value-in-use product aspects

Codes:	Times observed:
Value-in-use now network externalities	9x
Value-in-use now social desirable	6x
Value-in-use now network characteristics	9x
Value-in-use now co-creation	10x
Value-in-use now financial incentives	8x
Value-in-use now share options	7x
Value-in-use now customizable	9x

Category: Recommendations for development product aspects

Codes:	Times observed:
Recommendations for development network externalities	3x
Recommendations for development social desirable	2x
Recommendations for development network characteristics	7x
Recommendations for development co-creation	10x
Recommendations for development financial incentives	7x
Recommendations for development share options	4x
Recommendations for development customizable	8x

Category: Likelihood of recommendation product aspects

Codes:	Times observed:
Likelihood of recommending network externalities	9x

Likelihood of recommending social desirable	6x
Likelihood of recommending network characteristics	9x
Likelihood of recommending co-creation	10x
Likelihood of recommending financial incentives	8x
Likelihood of recommending share options	7x
Likelihood of recommending customizable	9x

Category: Value-in-use utilitarian motivation

Codes:	Times observed:
Value-in-use now effective	8x
Value-in-use now helpful	12x
Value-in-use now efficient	7x
Value-in-use now practical	8x
Value-in-use now cost saving	8x
Value-in-use now cost convenience	9x
Value-in-use now handy	10x

Category: Recommendations for development product aspects

Codes:	Times observed:
Recommendations for development effective	6x
Recommendations for development helpful	12x
Recommendations for development efficient	4x
Recommendations for development practical	8x
Recommendations for development cost saving	7x
Recommendations for development convenience	8x
Recommendations for development handy	6x

Category: Likelihood of recommendation utilitarian motivation

Codes:	Times observed:
Likelihood of recommending effective	10x
Likelihood of recommending helpful	10x
Likelihood of recommending efficient	7x

Likelihood of recommending practical	8x
Likelihood of recommending cost saving	10x
Likelihood of recommending convenience	10x
Likelihood of recommending handy	10x