Value Networks for Developing Mobile Innovations: The Case of Apple iPhone

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Abstract—This paper intuitively utilizes a methodical approach (i.e. VNM Model) to analyze the success of Apple iPhone mobile innovation from a value network perspective. The paper demonstrates, through the case of iPhone, how a powerful and well-designed value network is a critical enabler of innovations in the mobile telecommunications industry. Retrospectively, the paper also discusses key value drivers of successful value networks.

Keywords-Mobile Data Artifacts, Value Network, Innovation, Telecommunications Industry, Apple iPhone.

I. INTRODUCTION

The Mobile telecommunications business is undergoing a revolution on the move, driven primarily by innovative technologies and other related environmental factors such as globalization and deregulation. This noteworthy revolution is touching our intimate sphere; changing personal life styles as well as business functions and practices.

The mobile business is changing from one that was all about voice calls to one that is almost about data transmissions such as MMS, email and Internet surfing, just to name few. This shift is not surprising given the saturation of the voice market as well as the credit crunch. Nowadays, mobile telecommunications providers (from now on shortened to telecoms) are in need to generate new revenue streams by exploiting technology potentials.

Notwithstanding, creating and capturing value from mobile data artifacts (i.e. services and products) has proven problematic. For instance, some products for mobile data services, such as Palm Foleo, have been cancelled after investing millions of dollars. Nokia is another key example when it comes to the pressure of revenue streams. For example, Mintel research on mobile Phones and network providers indicates that Nokia has declared 30% fall in its third-quarter of 2008 profits [1].

On the other end of the spectrum is the iPhone that has found its way to success in mobile data communications. Starting from the first-generation, the iPhone “established its credentials as a device capable of generating huge revenue on the data side” [2]. Just to give few indicative examples, it has been found that iPhone users surf the Web more than those making use of other Smartphones [3]. Moreover, Apple is generating more profit year-over-year from its iPhone. Apple financial results for its fourth quarter ended September 26, 2009; indicates that “Apple sold 7.4 million iPhones in the quarter, representing seven percent unit growth over the year-ago quarter” [4]. In its annual report for 2008, AT&T points out that Apple iPhone enables AT&T to grow its wireless data revenue by 52.5% (more than $10.5 billion) as the exclusive distributor in the United States [5]. In Germany, the iPhone has boosted the data traffic by 30 times for its exclusive distributor, T-Mobile [2]. Whilst in the United Kingdom, Telefonica O2, despite the economic downturn, has benefited from the iPhone. It has been estimated that O2-iPhone users spend around 30% more per month than average users [1].

Apple’s achievement with the iPhone warrants particular attention in regards to what lessons can be derived about the future of mobile data artifacts as well as comprehending the underlying key value drivers behind such innovations. It is also interesting to delineate how a new entrant, such as Apple in the telecom industry, could not only penetrate a new marketplace and achieve an immediate success, but also take the industry to a higher level of competition. To be able to do so effectively, this paper intuitively adopts a value network paradigm to methodically explore how significant are Apple’s value network configurations in developing the iPhone innovation.

The remainder of this paper is structured as follows. Next, a background for the telecom industry and value networks is provided. Then, the undertaken research methods are described. Thereafter, the iPhone case is analyzed and evaluated. Last, we summarize and outline the paper’s contributions and we also discuss the major points highlighted in the iPhone case.

II. THE EVOLUTION OF MOBILE VALUE NETWORKS

Changes in the mobile operating environment have led to a shift from focusing on technology to emphasizing content and services. Telecoms have been also moving from offering just one simple voice service to providing portfolios of convergent services that integrate voice, video, data, and Internet technologies (i.e. MDS). To offer such integrated services efficiently and effectively, telecoms need to extensively cooperate and collaborate with many actors operating within and outside the mobile telecommunications sector. Indeed, mobile data artifacts are complex technological systems and their engineering functions (i.e. analysis, design, development, evaluation, delivery, maintenance, modification, and management) are best presented as collective achievements. This is because these functions call for coordination and collaboration amongst...
many actors with different knowledge domains, backgrounds, and expertise.

However, the relationships linking these actors are complex and non-linear [6,7]. For telecoms, this kind of relationships had led to a shift from forming value chains - that suits simple, linear, and static relationships amongst actors- to creating value networks.

The concept of value network is argued to be a more appropriate analytical lens to cope with this more complex, open, and collaborative environment [8], and is a more appropriate strategic tool for analyzing and understanding industries that are composed of constellations in continuous flux, rather than in static linear chains [6,9,10]. Nonetheless, building powerful value network is challenging and requires a detailed examination and alignment of a number of design concepts and their interrelationships [10]. Despite its complexity, it is highly significant. This is because designing powerful value networks is critical to the success of mobile data artifacts [10,11]. For example, Takeshi Natsuno, NTT DoCoMo’s Managing Director for i-mode services, argues that the reason why the i-mode service is generating high revenues in Japan, while MDS in Europe and USA are struggling, is related to market arrangements and structure [12]. Thus, we postulate that effective and powerful value networks are one of the key enablers of innovation in the mobile telecommunications industry. This argument, however, is supported in this research through the analysis applied over the case of Apple iPhone.

III. RESEARCH DESIGN

This paper employs the Value Network Model (VNM) developed by Al-Debei and Fitzgerald [10] to methodically and analytically examine Apple’s value network configurations concerning the iPhone innovation. Thus, the model in this paper is used as an analytical evaluation tool rather than being used as a development tool. The VNM model incorporates seven critical design constructs and shows their important relationships. A UML representation of the model is shown in Figure 1.

The VNM addresses the sort of collaboration and co-operation telecoms conduct and maintain not only with customers, but also with other related business actors inside and outside the mobile telecommunications sector so as to enable the development and offering of new mobile data artifacts. The concept of NETWORK-MODE examines whether telecoms need to employ closed (i.e. only selected actors participate); walled garden (new actors can participate if they stratify certain criteria), or open (i.e. any actor could participate) network mode. The ACTOR concept is about determining the participant actors within the network, whilst the ROLE concept examines the functional in addition to strategic roles of the selected actors in areas like artifact design, development and roll-out. The RELATIONSHIP concept examines what types of relationships are established amongst the value network actors along with their appropriateness. Looking at what objects are flowing and communicating amongst actors is the main idea behind the FLOW-COMMUNICATION concept, whilst CHANNEL concept examines how and through which mediums objects are communicated. Analyzing governance of the value network in terms of power and control is also considered vital and this is the role of the GOVERNANCE concept.

For analyzing and evaluating the iPhone’s value networks, the VNM model is deemed fitting. This is because such model provides a comprehensive and manageable method to analyze value networks creatively and effectively. Also, The VNM model is designed in a way that makes it easy to use for analytical evaluation purposes. It is organised in seven design constructs where constituent elements are identified within each construct. The relationships between the design constructs are also established and clear semantics are produced. The relationships between the constructs are required to show the interdependencies amongst the design configurations. They can also be used to control changes that happen to different design concepts by tracing their potential consequences.

To collect data about Apple iPhone, the current research utilizes various sources. We conducted semi-structured interviews with key practitioners (i.e. managers) in the international telecommunications industry those offering this mobile innovation. The interviews were transcribed, verified, and then analyzed. In addition to interviews, the research utilizes observation and documentation. Analyzed documents include annual and internal reports, market research, internal presentation materials, companies’ websites, and other documents related to Apple iPhone. The collected data is analyzed following the VNM model. The results of the conducted analysis are shown in the following sections in which we analyze and evaluate iPhone’s value network configurations and also show how such powerful value network configuration has led to the success of Apple iPhone.

IV. THE CASE OF APPLE IPHONE: INTRODUCTION

The iPhone has been developed as an *entire solution* in the mobile telecommunication industry with several added-values and convenient advantages in terms of functions and design for personal and professional use. For its iPhone,
Apple significantly employs the so-called device-centric model, where the main platform of services is encapsulated or connected directly with the mobile device [13]. Indeed, the iPhone is designed and developed as a convergent platform that blends a number of products and integrates numerous services and applications in a simple and user-friendly manner.

It is not only a mobile phone, but also a widescreen iPod with touch controls, an auto-focus camera, a GPS device, a breakthrough Internet communication device, and much more. As a convergent platform, the iPhone includes numerous bundled services and applications. In addition to text messaging, the iPhone features highly developed email capability, voicemail, music player, Safari browser for Web surfing, video recording and editing, voice control, Internet tethering and other networking capabilities (e.g. 3G and WiFi), and many other built-in applications such as calendar, weather, sports, news, and navigation services.

However, Apple provides only a limited multitasking through its iPhone OS due to its limited processing power, limited memory, and battery life in comparison to a PC. Despite these limitations, it is clear that this kind of innovation has brought Apple into the telecommunication industry with an astonishing potential for growth.

V. THE VALUE NETWORK OF APPLE iPhone: A CRITICAL SUCCESS DRIVER

In developing the original iPhone including its services and applications, Apple practiced a closed network-mode where only a few number of selected business actors were to some extent involved. For the purpose of this closed model, Apple has built up and leveraged strategic alliances and partnerships with particular key business actors inside and outside the telecommunication industry. The largest U.S. mobile and telecommunication provider with more than 80 million subscribers, i.e. AT&T (formerly Cingular Wireless), is the main strategic partner for Apple from the mobile telecommunication sector. Apple has also extended that and developed strategic relationships with Google, the world’s leading search-engine company; Yahoo!, the world’s biggest email service provider; and YouTube, the world’s dominant video sharing company.

The Apple-AT&T partnership set AT&T as the exclusive provider of the iPhone for use on its network in the United States. However, this deal has served Apple very well. AT&T was not demanding in the deal, but rather made compromises that no other mobile handset maker has ever had in such agreements [14]. AT&T has given Apple almost full liberty in regards to the iPhone design, development, distribution, branding, and its financial issues. AT&T, as a U.S. major telecom, is also a co-distributor (along with Apple) of the iPhone and has been a chief player in kicking off its sales. Although AT&T does not provide access to the iPhone, the telecom is an essential Internet Service Provider (ISP) for its services and applications. Moreover, the AT&T mobile network infrastructure, i.e. GSM/UMTS, has been an advantage to Apple. This mode of technology allows the same model of iPhone to be distributed to other countries due to the high potential for compatibility of such network infrastructure with other networks worldwide. For example, if the iPhone is distributed by Verizon telecom it would be probably limited largely to the United States as Verizon employs CDMA/EVDO technology that is much less common globally.

The partnership with Yahoo! enables Apple to provide effective and customized email services. The iPhone syncs with contacts stored on Yahoo!, but not with some other Web-based mail systems such as hotmail, and AOL. Yahoo! Mail on the iPhone enjoys powerful features that mean to give users a unique experience. In addition to its entire inbox facilities, it enjoys features such as push/pull instant notifications when users get new emails, user-friendly search facilities, and unified address book.

The partnership Apple has set up with Google helps in providing a variety of powerful search services to iPhone users. For Apple iPhone, Google has developed an optimized and innovative mobile application featured as fast, rich in terms of content and facilities, and easy to use. The application enjoys streamlined navigation with a very user-friendly interface. It also features customization when it comes to the menu bar that allows users to have straightforward access to their favorite applications. Speedier Gmail is another facility that instantaneously shows new emails and makes composing emails faster. The iGoogle gadgets are also available on the iPhone. Whatever users have setup on their iGoogle, such as stocks and weather, will be directly shown on their iPhone.

The Apple-YouTube partnership on the other hand allows iPhone users to enjoy the content of YouTube. To this end, Apple has designed an application that streamlines the content of YouTube to iPhone users wirelessly, whilst to ensure high-quality content and longer battery life on the iPhone, YouTube has encoded their videos in H.264 format. Furthermore, Apple has also included other visible and powerful partners for the iPhone such as Disney that helps in facilitating the users’ ability to view popular movies on the iPhone.

The advantage Apple has gained from such deals even exceeds the functional benefits to cover strategic ones. Indeed, Apple has entered the mobile telecommunication industry with almost zero experience in this market. Hence, it was rational to develop the iPhone with one of the key experienced telecoms in the U.S. market (i.e. AT&T). Having Google, Yahoo!, and YouTube as strategic partners was also highly useful. Each one of these companies is very successful and even dominant in its marketplace. Furthermore, these companies have already established huge customer bases of Web users that Apple aims to attract. These partnerships have created more intelligence pertaining to the iPhone development and helped Apple to create a more effective artifact (i.e. highly competitive with superior quality) than one it would make up by itself.
In addition to these fundamental relationships, following the iPhone launch, Apple has further extended the iPhone geographical reach by creating new partnerships with telecommunication providers located outside the United States. Telecoms such as Telefónica O2 in the United Kingdom, Deutsche Telekom’s T-Mobile in Germany, and Orange in France have all had agreements with Apple that afford them to be the exclusive providers and distributors of the iPhone in their respective nations. As these deals have a time constraint, that is usually a 2-year service contract, new distributors have emerged breaking Apple’s ‘one country-one provider’ rule and allowing the existence of dual and triple providers (and perhaps more in the near future) of the iPhone in the same country. Just to give one example, in the United Kingdom, starting from 10th of November 2009, Orange has become the second provider of the iPhone. Currently, Apple iPhone is provided in 77 countries by almost 105 country-particular telecoms.

Moreover, Apple is also collaborating with other companies in regard to the iPhone. For example, record companies provide content which Apple makes available to customers via its iTunes online store. Another example is that of Apple and Cisco working together to provide security features for the iPhone when it comes to networking and communications technology and services.

The way Apple managed its closed value network in regards to the iPhone is innovative. Apple has been able to enjoy nearly complete governance in terms of power and control over its iPhone network actors. Apple has maintained a value network that gave Apple full freedom to decide who to participate (i.e. closed) and which ideas to be developed (i.e. hierarchical) in regards to the iPhone. Actually, this closed-hierarchical model is favored by Apple as the company believes in this way it can control the device along with its design and development of the iPhone primary components and services. This (a) ensures a unique customer experience as intended, and (b) maintains the important compatibility-driven integration Apple wants to keep amongst the hardware, software, peripherals of the entire offering of the company. Highlighting this issue, Mark Collins, the vice president of AT&T’s consumer data services, indicates that contrasting the approach with other handsets where AT&T defines the applications to be used and the service offering issues, “with the iPhone, Apple decides what products and services to load on the device. It is a completely different business model” [15].

Interestingly, the development method of iPhone applications, in particular, has changed over time. As highlighted earlier, it initially followed Apple’s preferred model that is best characterized as closed and hierarchal where applications were chosen and approved by Apple, but developed through Apple and its selected actors. After the iPhone became more established, Apple has moved from a totally closed to a walled-garden model in regards to application development following a growth strategy [16].

Apple with this move aims to expand the iPhone customer base by mitigating its depressing effect being pre-programmed. To this end, Apple has launched a Software Development Kit (SDK) -in March 2008- that enables third-party developers to create applications compatible with the iPhone OS platform.

Third-party developers are not only individuals, but also groups, companies and software houses. For example, Oracle has developed a series of business applications for the iPhone such as Oracle Business Indicators that provide users with real-time, secure access to critical information of their business performance. This way Apple has reduced Time-To-Market (TTM) for these applications and at the same time allows more capacity and potential to create numerous applications that might fulfill the needs of a larger customer base. Although Apple provides a SDK for third part developers, it is still hierarchical when it comes to approval of software applications. After developers submit their applications, it is Apple that decides whether this application is approved through its formal application approval process- to be listed on its App Store, or not. In other words, the only official method to distribute iPhone applications is through the Apple App Store.

VI. DISCUSSION AND CONCLUSION

The iPhone has exposed a noticeable success while almost all other telecom providers are struggling to generate revenue from mobile data artifacts. Hence, this phenomenon has received a great deal of attention in theory and practice which might make upcoming mobile data offerings more powerful.

Through analyzing the case of Apple iPhone by the means of the Value Network Model (VNM), this research shows that the success of the iPhone is enabled by Apple’s effective value network arrangements and configurations. Indeed, the research shows that the iPhone’s value network is well-designed, well-managed, and powerful.

The applied analysis over the case of Apple iPhone also indicates four significant key value drivers of successful value networks in the mobile telecommunications industry: cohesion, fitting network-mode, uniqueness, and dynamicity. Cohesion can be defined in this context as consistency amongst the strategic objectives of value network actors. The case of iPhone has showed that Apple assured that selected actors are pursuing consistent strategies (i.e. differentiation) and complementing each others so as to achieve ‘win-win’ situations, and improve the economic value captured by each player. Furthermore, Unlike Chesbrough [17] who argues that open network is the right and only way to thrive in the new innovation landscape, the iPhone case has demonstrated that adopting a closed network model is highly effective if the company recognizes the knowledge domains needed and which parties to draw on to develop the new innovation effectively. This is because in such context, closed mode would facilitate the creation of the best solution or innovation [16]. Thus, we argue that neither a closed nor an
open telecom’s guarantees success. It is the best match between the telecom’s attributes and the features of one of the two network modes [see 16] that allows telecoms to engineer more innovative mobile artifacts.

On the other hand, the way Apple has achieved uniqueness concerning its value network is interesting. Unlike other telecoms and in particular mobile handset manufacturers that distribute their products and services through almost all possible channels, the way Apple distributes its iPhone only through exclusive and selected mobile operators in addition to Apple itself, contributes to the uniqueness of the iPhone. It was almost a rule of thumb not only in the telecom industry but also in many other industries if not all that increasing the number of distribution channels would increase the number of sales by attracting more customers as the product or service becomes more accessible in this way. Apple’s philosophy seems to be completely different. Apple for its iPhone has created an important psychological effect on customers as well as mobile operators by limiting the distribution channels. While making it harder to get the iPhone, Apple has attracted a great deal of attention by public, businesses, researchers, and other stakeholders. Many stakeholders have become very curious to explore this new artifact and follow its development. Due to this image that Apple has shaped for its iPhone, customers in particular have started to look at it as a precious artifact giving them prestige and status in addition to great utility. Apple’s philosophical approach in this context has also given the company a tremendous power in negotiating deals with different mobile operators. Apple has been able to make mobile operators feel advantaged if they are chosen to distribute the iPhone. The bottom line is that the Apple approach for the iPhone distribution has been unique and successful in making both customers and mobile operators think they are privileged when having the iPhone.

The iPhone case has also showed that dynamicity is significant to the success of value networks. Indeed, to remain its success, Apple has moved from a totally closed to a walled-garden network model over time in order to keep the iPhone successful by increasing its potential to meet the needs and wants of different customers through offering more varied applications as fast as possible. Even when Apple has moved to a walled-garden mode, it has not opened its whole network and the only facet that has become available to outsiders is the one related to application development. The iPhone hardware design, operating system, and core services and applications are still fully controlled by Apple and its closed network.

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