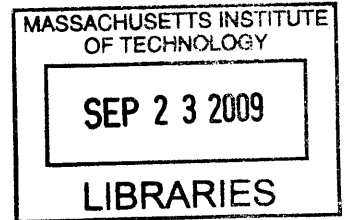


**Strategic Analysis of Mobile Viral Marketing through a Holistic Study in
Technological Evolution of Mobile Devices**

by

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Submitted to the System Design and Management Program
In Partial Fulfillment of the Requirements for the Degree of

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ABSTRACT

Rapid advancement in Electronic Communication gives rise to the popularity of Viral Marketing. Mobile Communication, in particular, offers greater potential in the utilization of this Word-of-Mouth phenomenon as a Marketing tool. Researchers have studied Viral Marketing from different perspectives, but little emphasis has been given to the unique characteristic of Mobile Communication as a platform for Viral Marketing. This thesis is therefore intended to explore this unique form of communication.

Using the point of view of mobile devices, which are directly related to the users, an analysis on technological evolution in this domain was conducted to study the fit between current Mobile Viral Marketing practices and the technological parameters. To support this study, extensive literature research on Viral Marketing was conducted, along with industry analysis on Mobile Communication and sample cases of known Mobile Viral Marketing practice in the U.S. In general, the analysis found that existing Mobile Viral Marketing strategy mostly mimics the general practice of Word-of-Mouth Marketing and some aspects of this general practice are not suitable for the unique characteristic of Mobile Communication. The study on technological evolution also yielded several patterns on the key parameters of Mobile Device Technology that were used to model the future of this domain. Lastly, using the identified shortcomings of existing strategy and the future depiction of this technology domain, a strategic framework for Mobile Viral Marketing was constructed. This framework is intended to provide businesses with a forward-looking perspective in the utilization of Mobile Communication as a means to spread the words about their products or services.

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1. INTRODUCTION

1.1 Motivation

Viral Marketing (VM) is considered as one of the ‘new rules of marketing & PR’ (Scott, 2007). Marketers view it as a low-cost and effective method to reach large audience. The ‘viral’ phenomenon is precisely what it is named after: a virus. Viruses are associated with infectious diseases, in which a person transmits the disease to one or more people through various means, resulting in rapid, often uncontrolled, spread. The rise in electronic communications further advances VM as transmission of messages becomes increasingly rapid and widespread. While businesses begin to invest in viral marketing in the hope of achieving greater return on a low-cost investment, many have also been unsuccessful (Scott, 2007). Assuming the realization and effectiveness of the seemingly trivial concept of traditional word-of-mouth, marketers often ignore the unique characteristic of electronic communications which requires properly crafted strategy in the execution of VM campaigns. Consider an email message with advertising content; while it may seem effortless to forward the message to other users, the outcome is often the opposite whereby users begin to block incoming messages containing advertising content, effectively inoculating themselves against the spread of the (marketing) virus.

The emergence of mobile communications introduces both opportunities and complexities. This mode of communication that allows individuals to transmit messages from virtually any locations at any time can potentially create more effective VM. On the other hand, the dynamic nature of mobile technology, particularly mobile devices, along with various limitations in the technology also creates challenges for marketers to develop effective VM strategies. The mobile communication domain is unique with significant difference from other forms of electronic communications; there is not yet much research literature dedicated to this

specific domain when analyzing VM strategy. The goal of this thesis is to develop a strategic framework for Mobile VM that both addresses the shortcomings of existing practices and leverages the evolving technological advancements in mobile devices. As there very different patterns of adoption of mobile technologies in different countries, this research will primarily focus on the United States.

1.2 Research Questions and Expected Findings

The questions being addressed in this thesis are as follow:

How effective is the existing Mobile Viral Marketing in the current mobile device technology domain?

As technology advancement accelerates, what kind of Mobile Viral Marketing strategy is appropriate for the future domain of mobile device technology?

In answering the first question, this research will attempt to identify the key characteristic of existing Mobile VM strategies and assess their efficiency in the context of the current mobile device technology domain. The expected findings from this analysis are the addressable shortcomings in current strategy that can be used as the basis in formulating a new strategic framework for Mobile VM. For the second question, the research will focus on understanding the current and future evolution of mobile device technology domain. The goal is to understand the technological characteristics and capabilities, in order to structure a more effective Mobile VM strategy that fits the ever-changing mobile device technology domain.

1.3 Approach

Literature Research

Although this thesis primarily focuses on mobile technology, it is crucial to first understand Viral Marketing in general, particularly in assessing its effectiveness. Various studies have been conducted in this area and relevant theories will be extracted and placed in the context of mobile communication. This analysis on VM in a broad sense will complement subsequent analysis pertaining to the effectiveness specifically in the mobile domain. Literature research will also be conducted to support technological analysis of mobile devices and their utilization.

Industry Observation and Technical Data Analysis

In understanding the accelerated advancement of mobile device technology, a holistic analysis of the technological evolution of mobile devices will be conducted to model the future of this domain. Technical data from the industry will be collected to study the development of various parameters. This includes, but is not limited to, technical specifications from device manufacturers, published data from organizations, and personal experience of various mobile users.

Case Studies

Several known cases of marketing campaign involving mobile VM will be analyzed as part of the attempt to assess the effectiveness of the strategy and to derive a common strategy among these cases. Given the limited availability of specific mobile VM cases in the United States, the study will also include general practices of mobile VM, such as SMS Advertising, irrespective of the specific products and services involved. These cases will be analyzed

separately to highlight key strengths and weaknesses before deriving from them inductively a generic analysis of current VM strategy as a whole.

2. VIRAL MARKETING IN MOBILE COMMUNICATION

2.1 Definition and Scope

Viral Marketing

The term Viral Marketing (VM) is often used interchangeably with Word-of-Mouth (WoM) marketing or buzz marketing. These other terms, however, are often associated only with pass-along communication among members within a network or social circle, or referred as 'Push' VM model in this research. In a broader sense, VM doesn't always involve direct communication and often goes beyond one's immediate social network. Using the same analogy of biological virus, the agent can expose the disease in a crowded public place, resulting in even wider spread to people beyond the agent's direct social network. This is referred as 'Pull' VM model in this research. Thus, the definition of VM here is not constrained to direct communication or an individual's social network. The basic categorization of VM will be further discussed in this research.

Additionally, VM may refer to transmission of information via both electronic and traditional means, such as face-to-face conversation. However, the advancement in electronic communication technologies is considered the driving force behind the perceived effectiveness of VM as a new marketing tool. VM in this research refers to transmission of information about products or services from one person to another, directly or indirectly, primarily by means of

electronic devices and services. Specifically, emphasis is given to the utilization of mobile devices and services to create this viral behavior.

While there are numerous key components in the field of Marketing Communications that determine a success of a marketing strategy, not all of them are relevant to the motivation and goal of this research. Specifically, this research focuses more on the distribution of the marketing message rather than other aspects such as the content of the message, the quality of the communications, and the cost aspects.

Mobile Communications and Mobile Devices

There hasn't been a single clear definition that accurately describes what a mobile communication is. Mobile communications continue to evolve as new technologies and new ways to communicate emerge. For the purpose of this research, mobile communications, unless noted otherwise, are defined as forms of long-distance, wireless, communication, by means of portable consumer electronic devices capable of supporting either or both voice and text communications. In other words, mobile communications are loosely defined as communications via various types of mobile devices and services currently available in the market.

Further, central to this research are the various characteristic of the mobile devices. The business ecosystem of mobile industry consists of various players besides the device manufacturers, such as the service providers and content providers. By centering the research on the trends in mobile device technology, one can establish a focal point through which these interdependencies with other players and advancement in mobile communications as a whole are viewed. Mobile devices in this research refer to handheld consumer electronic devices capable of supporting at minimum voice and/or text communications, or generally referred as the cellular

phones. Ballard (2007) refers to it as PCD (Personal Communication Device) with four distinctive characteristics:

- Personal – The device belongs to an individual and carried by the individual most of the time.
- Communicative – Capable of sending and receiving messages.
- Handheld – Portable enough to be operated with one hand and stored in pocket or other ‘wearable’ cases.
- Wakable – The ‘always on’ experience and readiness to be functional ‘at a single touch’, by users’ demand or incoming messages.

2.2 Viral Marketing Types

Researchers classify VM in various different ways. Since VM is an emerging area of Marketing, the fine-grained taxonomy of VM may continue to evolve along with the methods of communication. Understanding of these basic types of VM supports the analysis of Mobile VM criteria in the next section. At a very high level, there are two basic models of VM based on the transmission approach of the message: ‘Push’ or ‘Pull’ VM. This terminology is not meant to be associated with the general ‘Push’ and ‘Pull’ Marketing notion, which refers to strategy of demand creation, although the underlying concept is relatively similar; the key difference being who is doing the ‘Pushing’ or ‘Pulling’, the company marketing the product, or in the case of VM, the participants involved in spreading the viral message. The boundaries between these two types of VM are fading and advancement of technology allow the creation of more hybrid approach to build effective VM strategies that take advantage of the strengths of each type.

Push Viral Marketing

This type of VM is often closely associated with the general idea of Word of Mouth marketing. In this model, a person with information regarding a particular product or service passes along, or ‘pushes’ the information to some or all people that he knows, that is to people in his or her direct personal network. The information is transmitted through common means of communication, such as face-to-face communication, email, or telephone. Restaurant recommendation from acquaintances is an example of this type. The agents usually have good knowledge of the target recipients of the information and the agents consciously make the effort of transmitting the marketing message. In other words, the transmission of information is usually intentional and directed.

The availability of mobile communication has enabled even faster spread of this type of VM. Recommendations are generated more instantly, sometimes immediately after or even before the end of the experience of a product or service. As an example, despite the flashy and glittery marketing campaigns in marketing the release of a new movie, people still rely on reviews to make decision whether to watch it or not. Moviegoers now can provide such reviews instantly when they are watching or just finished the movie, through means of text messages to their social network (Dobele et al., 2005).

Strengths & Weaknesses

A push message is usually tied to an agent’s social network. A mobile text message, for example, is considered personal especially when it contains a recommendation. The agent usually sends the recommendation with knowledge that the recipients have a certain degree of interest in the subject. With the mutual interest in the subject, the personalization of message,

and the social tie between the recipient and the agent, Push-VM has a relatively high degree of credibility. The recipients are then likely to act on the recommendation, including passing the recommendation to their own social network.

Given this personalization level and the required knowledge of the recipients' interest, push message is, however, usually constrained to a small number of target recipients. Even with the advancement of electronic communication that allows a (much) larger number of potential recipients through transmission of a single message, the absence of this personalization or mutual interest may easily result in the notion of Spam or unsolicited message. De Bruyn and Lilien (2008) suggest that Spam email messages, for example, have "cluttered electronic communication" and creating more challenges to VM strategy formulation. Consequently, effective Push-VM also requires a greater effort by the agent to personalize the message for different groups of target recipients. It is usually less important for the agent to have credibility in the subject about which they are communicating from the perspective of the potential recipients, but to have strong interpersonal tie with the recipients is often more important.

Pull Viral Marketing

A simple analogy of this type of VM is the marketing approach through shopping bags. Retailers, particularly in shopping centers, utilize shopping bags not only to spread the brand, but often to also send specific information by printing marketing information on the bag. As an example, Banana Republic has a special shopping bag design with SALE in large text, to be used during its regular Sale seasons. Consumers carry these bags around the shopping centers, and transmit this message to people within close proximity of the bags. Only those who voluntarily read or 'pull' the message are considered to be 'infected'. The agents who are transmitting the

marketing message don't typically know the receivers of the message, and have little or no control over who views, and later redistributes, the message. Often time, the agents perform this work of transmitting marketing messages unconsciously, or effortlessly. In other words, the transmission of information is usually unintentional and not directed at any particular target audience.

In electronic communication, examples can be seen in the emerging world of online public blogging. Agents post recommendations in their personal public blogs. Agents generally don't have much control over the potential recipients of the message and recipients voluntarily receive the messages by reading the blogs. Although many still consider blogging a distinct form of marketing, separate from viral marketing, the increasingly large network of bloggers in fact allows greater spread of a marketing message. Nelson (2006) also uses the term 'viral blog' as one of blogging categories, and suggests that bloggers spread the ideas in a viral way through link references in their blogs. In electronic communication, pull messages are usually stored in the agent's space, such as blog server, versus in push messages where recipients usually 'download' the messages to their personal space, such as mail inbox or phone memory.

Strengths & Weaknesses

Since recipients of Pull-VM are generally willing to receive or view the message, it less likely to be considered spam. The recipients of Pull-VM voluntarily seek for relevant information, which is contained in the message created by an agent, and are thus more likely to have mutual interest with the agent. Once an agent finds a 'visible' place to broadcast the message, a single message can capture a larger pool of potential target audience. The spread of message can thus extend beyond the agent's direct social network. In order for recipients to

voluntarily receive or view the messages, the credibility of an agent with respect to the subject of the marketing message is more important, while the interpersonal tie between the agent and the recipients is less important, and in many cases non-existent. Bloggers are also considered to be the 'influencers' with credibility to spread the words about products, such as books (Nelson, 2006).

Although it seems relatively simpler to reach a wider audience with Pull-VM type, generating the desired level of interest from the recipients of the message may not be straightforward. With relatively less control over the audience of the broadcasted message, the content of the message needs to be attractive and neutral enough for the general audience to voluntarily turn into active recipients and potential Pull-VM agents. Additionally, finding the 'right place and right time' to transmit the message is often difficult. Although Nelson (2006) credits the credibility of bloggers in the recommendation process, the web is an increasingly crowded place for blogs with similar topics, trying to attract the same niche of potential audience.

Blurring Boundaries

The key in understanding these different types is not to favor one over another. Each of these has its strengths and weaknesses, and the goal is to find ways to exploit the strengths in each type of VM and formulate strategies to achieve the desired result. This is particularly important with the advancement of communication technologies. Although technology continues to drive communication cost down, thus allowing broader reach of audience, it also enables recipients of marketing messages to have more sophisticated ways of filtering the messages. Consequently, VM strategies in modern communication typically utilize a hybrid of both VM types to effectively communicate the marketing message to targeted audience.

A popular example of hybrid VM in modern communication is the ‘status’ broadcast in most social networking sites, such as Facebook and Twitter. When an agent updates the status message, it often contains information about a certain product or service that they are using or consuming. The visibility of the broadcast is usually limited to just the people within the agent’s social network or people who choose to receive the status updates. In this case, agents have some control over the potential recipients of the message and recipients voluntarily view the message. This is also similar to the concept of email list subscription, where the agents know that the potential recipients have some degree of interest in a particular area. However, even with the voluntary nature of the reception, these types of broadcast messages can easily be considered spam if recipients feel that the annoyance from the overflow of messages outweighs their interest in the subject. Modern communications systems, websites, and other networks usually allow recipients to unsubscribe in very simple steps.

A VM example that’s often analyzed by researchers is the Hotmail email invitation, in which the Hotmail system inserts a short advertising inviting non-hotmail email recipients to sign-up for Hotmail service. Many email services now follow this model and the advertising extends to other products beyond the email service itself. Some examples are shown in Figure 1. This type of VM appears to be a standard Push-VM type, because agents push the message to the recipients. However, the agent in this case often doesn’t have conscious knowledge on the existence of the embedded message and no personalization is done in the process. Thus, effort to transmit the particular message is very little to none. Jurveston (2000) calls this agent “involuntary salesperson”. In Hotmail’s case, it was considered a successful viral campaign, with users growing to 12 million in 18 months.



Figure 1: Example of Viral Marketing Message in an Email

2.3 Mobile Viral Marketing Criteria

The primary goal of this research is to define the strategic fit of current VM strategy in the mobile device domain. The next step in this process is analyzing the effectiveness of known Mobile VM cases. However, the actual effectiveness of VM has been relatively difficult to quantify. One common way to measure the effectiveness of a marketing strategy is financial return, although it is usually difficult to isolate the direct contribution of one particular campaign to the growth of the market for a particular product or service. Cruz (2008) also argues that the inclusion of financial dimension in quantifying the effect of VM is debatable, and non-financial measures are more significant in evaluating VM campaigns.

For example, many articles discuss the creativity of Burger King's Subservient Chicken VM campaign for one of their food products. The website, featuring interactive video of a man in a chicken costume, generated 14 million unique visitors and 396 million in less than a year (Anderson, 2005). Although BK reported an increase in weekly revenue after the campaign, there are no clear explanations whether the advertising success directly translates to the claimed increase in revenue. It is difficult to identify customers' source of 'motivation' when they decide to visit the restaurant and make the purchase.

Additionally, some VMs are not directly offering a product, but are meant rather to raise awareness. In such case, marketers are typically interested in measuring the spread of the message itself, rather than purchasing behavior or financial outcomes. Cruz (2008) also mentions Hits/Downloads as one of the key evaluation criteria for VM. However, this is not as straightforward for non web-based VM, such as Mobile VM. In the example of the Subservient Chicken, the message itself is a web page with built-in tracking mechanism to calculate the number of visitors, including the breakdown between unique and repeating visitors. VM through other means of communication, such as mobile communication, is usually difficult to quantify since the spread of message is not as easily traceable.

For the purpose of this research, the measure of effectiveness is focused on *criteria that increase the reception of a message transmission and the likelihood of the recipient to become the transmission agent for the message*. As stated by Cruz (2008) in his survey report, “[marketers] agreed that knowledge of the profile of these people who spread VMC messages and understanding their behaviour and the reasons why they chose to spread messages in this way, was absolutely critical.” Primarily focusing on the second point of the statement, analysis of these criteria is derived from some of the key criteria of VM identified by Cruz (2008) in combination with the strengths and weaknesses of the Pull and Push-VM. With the differences in communication via Personal Computer and Mobile Devices, the analysis is done in the context of mobile communication in order to derive the most relevant criteria, including those that may be universal to various means of communication. Figure 2 illustrates a VM transmission process and the criteria are indicated by the blue boxes.

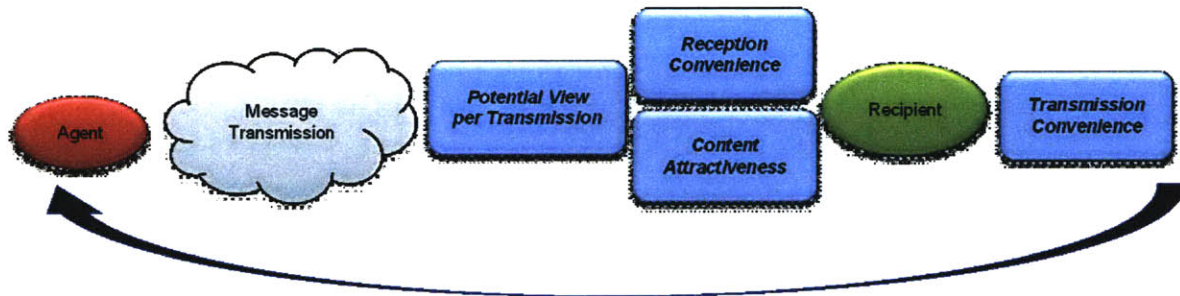


Figure 2: Viral Marketing Criteria in a Transmission Process

Transmission convenience

Cruz found no agreement among marketers in his study, on the importance of ‘transmission convenience’ (Walker, 2002) in evaluating VM criteria. However, in mobile communication, the mobility nature of the potential agents makes it important to reduce the effort needed by an agent to pass along or broadcast messages, particularly non-critical marketing messages. In addition to required efforts of the agent, the availability of the service required to transmit the message is equally important. For example, while SMS service for text messages is generally available, 3G or mobile internet service is still limited.

Reception convenience

Similar to transmission convenience, mobile VM must also consider the reception convenience. In mobile communication, the short attention span of the users and the constant distractions increase the likelihood that complex and unimportant information is dismissed as it’s received. Oulasvirta et al. (2005) describes it as “Interaction in 4-Second Bursts” and explains that “resource competition is very real and seriously constrains mobile interaction.” Saving the message for later is not always an option especially in Push-VM where messages need to be stored in the device’s limited memory.

Potential view per transmission

Reach is one of the top criteria that marketers consider very important in evaluating VM campaigns (Cruz, 2008). Given the difficulty in tracking the reach of mobile VM where hits/downloads information is not always relevant as a direct measure of reach, it is useful to evaluate potential views that each transmission can expect to get. From the discussion of Push and Pull-VM types earlier, the nature of VM message transmission can help estimate the visibility of the message in each transmission. While visibility may seem more relevant for traditional marketing such as billboards, the discussion on Pull-VM makes it clear on why the concept of message broadcasting can also be viral in modern communications.

Content attractiveness

There are many factors related to the content of a VM message, such as informativeness, humour level, and shock level, which marketers consider as relevant criteria in VM (Cruz, 2008). Since the aim of this research is to understand the high-level VM strategy, this criterion is generically defined as content attractiveness with less emphasis on the relevancy of the marketing message to the actual goal. Attractive content may also include any incentives associated with the VM message. The relevance of the content to the recipient and personalization level may also be considered measures of attractiveness.

These criteria will be used in the analysis of various VM case studies in Chapter 5. The goal is to uncover common patterns in the existing VM strategies and relate them to the technological parameters. These criteria will also be used to identify potential areas of improvement in the VM strategies to fit the anticipated future advancement in these technological parameters. Chapter 6 will elaborate the strategic implication of these analyses.

3. ANALYSIS OF TECHNOLOGICAL INNOVATION

Consumers behave differently with mobile devices as they do with personal computers or other means of communications. More importantly, these behaviors are largely driven by the innovation that has taken place and is taking place in mobile devices and the availabilities of various activities users can perform on the go. To understand the current state of mobile device technology and its future implication, an analysis of its technological evolution provides a valuable insight into the key changes that drive the advancement of this technology. Moreover, although various breakthroughs in the past decade often trigger the belief that anything is possible in technological development, it is important to also understand the inherent limitations of the technology domain. This holistic view of mobile device technology is part of the building blocks in the analysis of Mobile VM strategy and its effectiveness.

3.1 Key Parameters

The characteristic of a particular technology can be defined by a set of measurable key parameters or attributes, such as the resolution of display technology. Defining these key parameters in mobile device technology is the first step towards a comprehensive analysis of the technological evolution. This research focuses on three main categories: Human Interface, Hardware Operation, and Software/Service, and the key parameters in each category are explained further below. Although most of these parameters can be measured quantitatively, such as weight, some qualitative parameters are also included. For relevancy with this research, such parameters will be measured primarily by the increasing number of available features associated with the parameters, such as the increasing availability of software applications in a device.

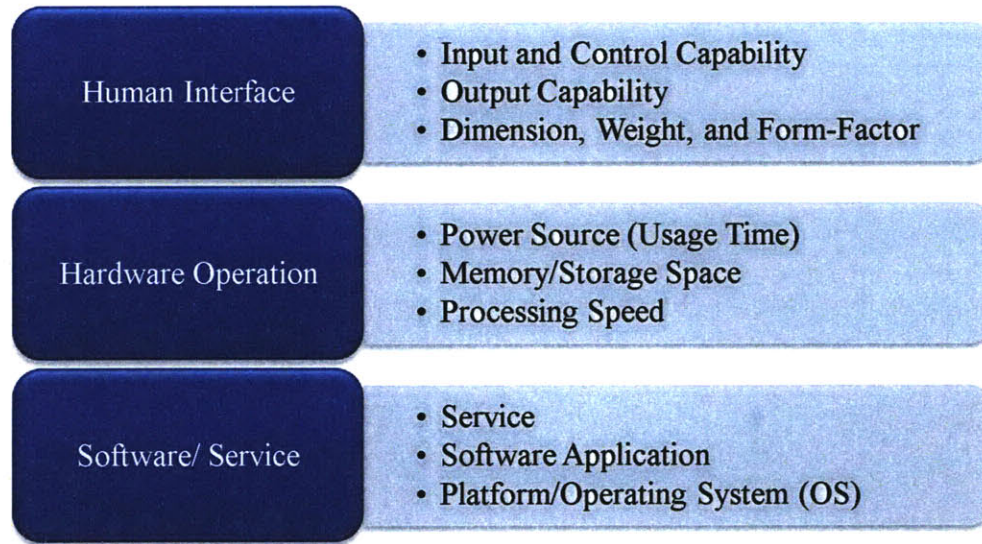


Figure 3: Key Parameters of Mobile Device Technology

Human Interface

The parameters in this category are associated with the physical look-and-feel of a device and the components that directly interact with users during normal operation of the device. Input and control are the capabilities of a device that allow users to add data into the device and to navigate around the data and applications contained in the device. In typical devices, these are the keypad for text input and the navigation buttons, but other input capabilities, such as camera, Bluetooth, and Infrared, continue to emerge. Output capabilities of a device are the methods that the device uses to deliver information to the user, which commonly include audio and visual outputs, or the speaker and the display screen. Some of the input features, such as Bluetooth, can also provide output functionalities. The dimension of the device is the physical size of a device in the state when the user is not using it such as the folded state of a clamshell phone. The weight of a device is the total mass of the device with the standard components embedded in it, which may include or exclude the battery depending on the manufacturer. Lastly, the form-factor is

associated with the shape of a device when both in operation and in idle state. Some examples of the known form-factor are clamshell, brick, and slide phones.

Hardware Operation

These parameters are associated with the characteristic of the device that is not directly visible by the users, which usually are the internal hardware components of the device. Power supply in general term may be associated with various characteristic of a battery, such as recharge time. Although such parameters may also be relevant, the more commonly used metrics in mobile device are talk-time and standby-time. Memory or storage space is another parameter that might have been less of an importance a decade ago. This is the capability of the device to permanently or temporarily store the information inputted or received by the users. As devices advance, the types of information also evolve from simply contact information to multimedia content, which requires greater memory space. In addition, such advancement in content also makes the processing speed of mobile devices increasingly important. While hardware operation rarely becomes the primary factor in purchase decision, it determines the performance of the device in processing the increasingly rich content.

Software/Service

Software/service parameters are usually difficult to quantify. However, these parameters are important in understanding how the technology is evolving. They are also part of the key criteria in purchase decision of a mobile device in addition to the physical criteria. Applications are the software tools which allow users to perform various tasks using the device. Common devices usually have basic text messaging and basic organizer applications such as calendar, whereas newer devices usually have multimedia applications, such as music player and web-

browser. The terms Platform and Operating System (OS) are often used interchangeably, and in most cases, they are the same technology. OS is the underlying software on which these applications are installed and executed, such as Symbian, while Platform also refers the technology being used to develop the applications, such as Java ME. Service is included in the list key parameters although it mainly refers to the network provider's offering. However, it is important in the analysis of technological innovation of the device because some mobile applications can only work with the availability of the services, such as messaging application, SMS service, and data services for Internet access or e-mail.

3.2 Development in Key Parameters

Ever since Motorola DynaTac, the first commercial portable cellular phone in the U.S., was released, there have been countless innovations in mobile device technology domain. Given the enormity of this domain, it is important to view the evolution from the high level but detail enough to cover the important changes throughout the years. In this research, a list of devices from the past 25 years has been identified. The selected devices are generally those with notable success in the market or those that introduced radical changes in one or more key parameters. These devices and their technical information related to the key parameters are then used to study the development of the technology in general. These key developments are described under each category of the key parameters below.

1989 Motorola MicroTac 9800X 	1996 Motorola StarTac 	1997 Nokia 9000, Communicator 	1998 Nokia 6160 	2000 Nokia 8260 	2001 Handspring Treo 180/180g 
*Flip cover form-factor *Increased portability	*Clamshell form-factor *Increased Portability	*Productivity apps *Qwerty keyboard *Nokia's first smartphone	*'Candybar' form factor *Nokia's best-selling of the 90's	*Internal-antenna form factor *Increased portability	*PDA-Phone *Stylus (Graffiti) input
2002 Sanyo SCP-5300 	2002 Blackberry 5810 	2003 Treo 600 	2003 Motorola MPx200 	2004 RAZR V3 	2005 W800 
*First Camera Phone	*Blackberry Phone	*Integrated PDA, Camera, Phone	*First microsoft-based smartphone	*Ultra-thin form factor	*Integrated 'Walkman' (Music capabilities)
2005 Nokia N70 	2007 iPhone/iPhone 3G 	2008 G1 	2008 Blackberry Storm 		
*Integrated multimedia, 3G smartphone	*Touch form-factor, tilt/motion sensor *OS X - based *Application marketplace	*Open Android Platform *Slide & touch form factor	*Blackberry with touch form-factor		

Figure 4: Technological Evolution in Mobile Devices – Sample Devices¹

¹ Multiple Sources

Evolution in Human Interface Parameters

- The advancement in multimedia content demands larger display area in order to deliver the best mobile experience to users. As a result, despite the interest in portability, the size of the device surface has not been decreasing dramatically over the years as shown in Figure 5.

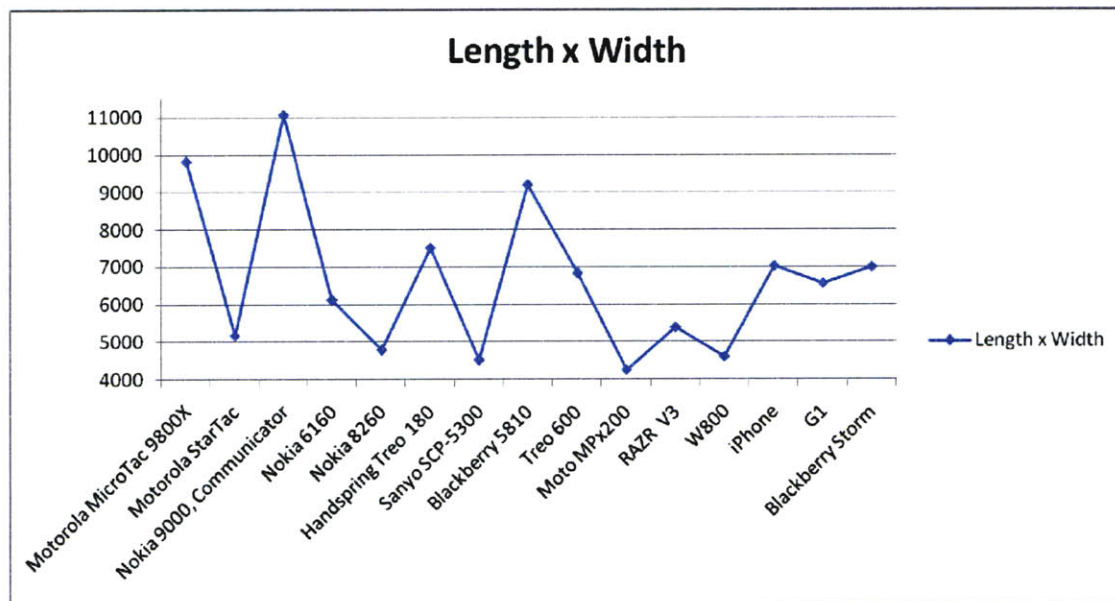


Figure 5: Trend in Device Size (Length x Width)

- The thickness of the device, on the other hand, shows decreasing trend over time as shown in Figure 6. This is partly attributed to more advanced hardware technologies such as battery and semiconductor chip. Besides portability reason, the one-hand operation of mobile device also makes slim devices more preferable for ergonomics reasons.

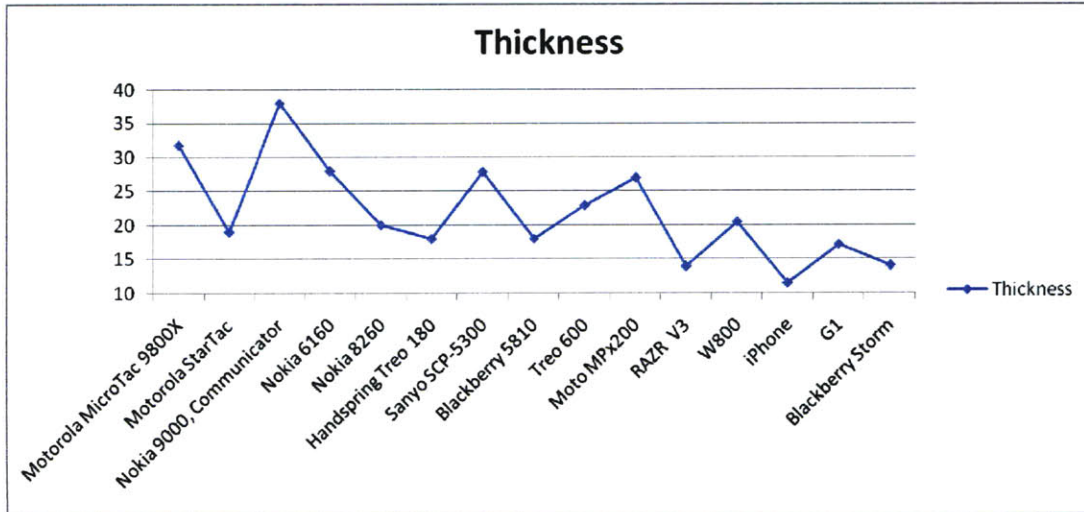


Figure 6: Trend in Device Size (Thickness)

- Radical innovations are constantly observed on the form-factor of the device, and they are usually followed by incremental innovations to increase the portability of the same form-factor. Some examples of form-factors are touch-screen, swivel, and slide, with recent releases showing combination in various form factors, such as in G1 (Figure 7).



Figure 7: Example of Mixed Form Factor – Google G1 Phone²

² www.onlyg1.com

- Other notable innovations are the integration of functionalities of other portable consumer devices, such as camera and music player, into the mobile phone. The integration of camera also introduced a new form of input capability. Other input capabilities such as Bluetooth have been gaining popularity as well, but the utilization is still not as widespread as that of camera.
- The standard input and output capabilities, on the other hand, have undergone mostly incremental changes. Usable text input capabilities have been limited to a handful of types such as QWERTY keypad, stylus, and touch, which is also based on QWERTY format. Display screen has also undergone various incremental changes in the resolution, but it is still limited by the size of the device itself, which will be discussed further in the next sub-chapter.

Evolution in Hardware Operation Parameters

- Even with the increasingly sophisticated applications requiring greater electro-power, the performance of the power supply generally improves when observed from the talk-time perspective, as shown in Figure 8. However, the performance improvement is unclear from the perspective of other applications' usage time. Manufacturers still don't have standardized metrics to measure this application usage time, partly due to the variety of power requirement by available applications. Apple uses 'internet usage time' as an additional parameter of the iPhone, but this still doesn't accurately measure power performance of the phone in general.

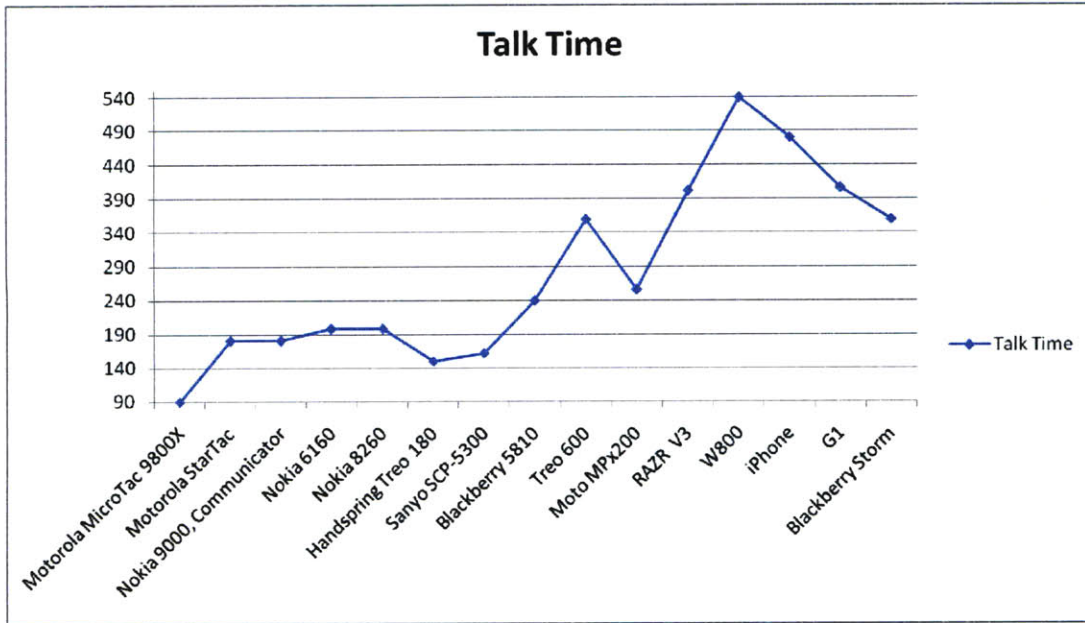


Figure 8: Trend in Power Source (Talk Time)

- Similar to those of personal computer, the memory and processor capacities in mobile continue to improve, thus allowing faster storage and processing of rich content. Given the little relevancy with the research, these parameters are not discussed in more in-depth.

Evolution in Software/Service

- The most important trend observed is the recent trajectory in the number of available applications, primarily contributed by the rapid increase in the number of iPhone applications. Although third-party applications have been available before the release of iPhone, the proliferation was significantly slower. Windows Mobile, for example, reached 20,000 applications only after 9 years since the OS release, compared to iPhone which took 8 months to reach 20,000 applications (Darlymple, 2009). Additionally, the types of available applications also evolve. Certain breakthrough applications gradually become common features such as organizers and multimedia players.

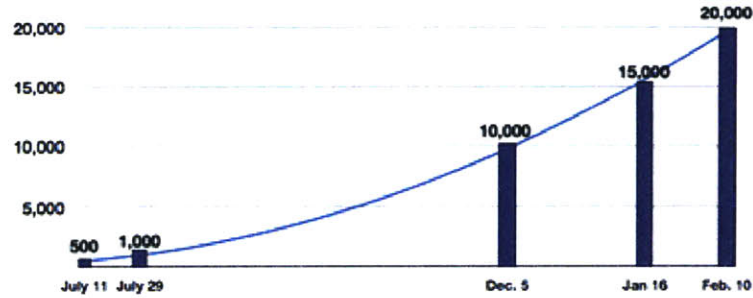


Figure 9: Trend in Number of iPhone Applications³

- With the relatively slow implementation of 3G services in the U.S, the services available to mobile users have been relatively limited. Some earlier services provide limited Email and Internet capabilities, but with considerably slow performance. Other services that are recently available, such as GPS, were also offered in some of the older phones either directly or through external devices connected via Bluetooth, for example, but mostly did not have the satisfactory performance. One interesting observation is the exclusion of the widely-used MMS service from the first releases of iPhone and G1. This is possibly due to the advancement in the internet services that also offer multimedia messaging capabilities as alternative of MMS. A brief summary of basic services offered are shown in Figure 10.

³ App Store tally: 20,000 apps in seven months, Retrieved From: <http://www.macworld.com/article/138753/2009/02/appstore.html>

		Voice	SMS	MMS	Internet / Email
1983	Motorola DynaTac 8000X	√	x	x	x
1989	Motorola MicroTac 9800X	√	x	x	x
1996	Motorola StarTac	√	x	x	x
1997	Nokia 9000, Communicator	√	√	x	x
1998	Nokia 6160	√	√	x	x
2000	Nokia 8260	√	√	x	x
2001	Handspring Treo 180	√	√	x	√
2002	Sanyo SCP-5300	√	√	x	√
2002	Blackberry 5810	√	√	x	√
2003	Treo 600	√	√	x	√
2003	Moto MPx200	√	√	x	√
2004	RAZR V3	√	√	√	√
2005	W800	√	√	√	√
2007	iPhone	√	√	x	√
2008	G1	√	√	x	√
2008	Blackberry Storm	√	√	√	√

Figure 10: Trend in Service Availability

- New OS/Platforms have been emerging alongside standardization efforts, such as Java ME. However, the more recent releases of Smartphone show even more fragmented trend in the share of mobile platforms, especially in the U.S. While Symbian has been enjoying dominant share in the mobile OS platform, other platforms are beginning to capture this share, as can be seen in Figure 11.

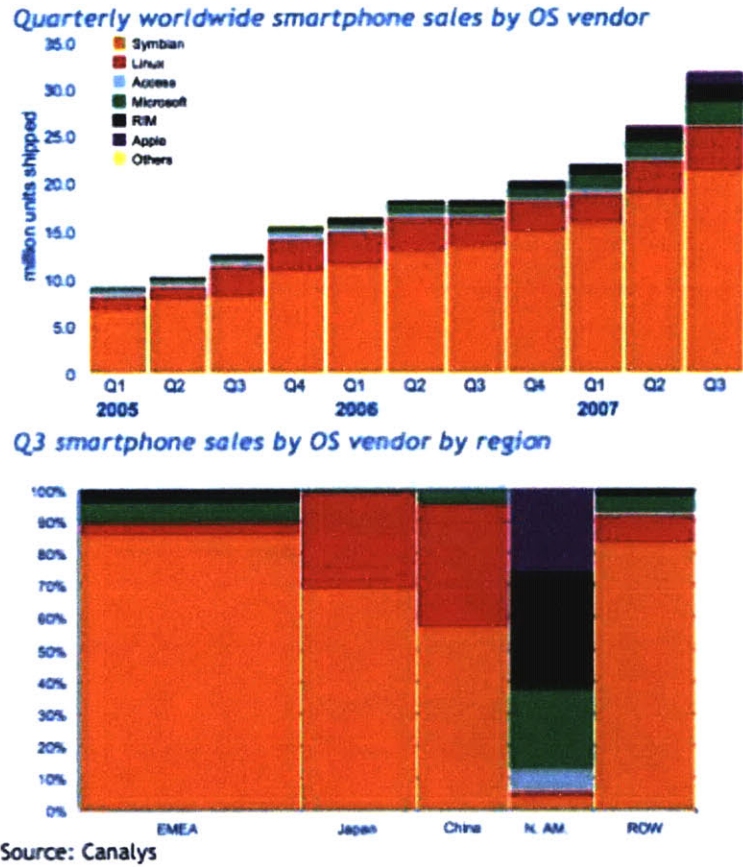


Figure 11: Trend in Mobile Device Platform⁴

3.3 Limitations

With the seemingly unlimited creativity surrounding technological innovation, it is often tempting to ignore the inherent limitations in a given technology domain. These limitations ultimately constrain the level of technological advancement that can be applied. In mobile technology, there are numbers of common hardware limitations, such as memory capacity, and innovators continue to find solutions to overcome these limitations. However, there are more high-level limitations mostly associated with the usability of the technology, and directly affect

⁴ iPhone rapidly gains market share in North America, Retrieved From: <http://www.wirelessinfo.com/content/iPhone-rapidly-gains-market-share-in-North-America.htm>

the design of a mobile device and its services. The focus on usability is important in this study given that it directly relates to the transmitting and receiving process of VM messages. The three identified limitations are: Portability, Task Simplicity, and Privacy.

Portability

Portability here refers to the characteristic of a mobile device that allows consumers to carry the device with them. It does not refer to other usages of the terms such as application or number portability. Consumers have various requirements when it comes to the acceptable portability of a mobile device, and there is no single number that indicates the universally acceptable level. Demographics and skills are among the important determinants that affect the variation in the level of acceptance (Sarker and Wells, 2003). Nevertheless, the ability to carry the device comfortably, or the weight and size limit of a device, continues to be one of the most important requirements in a mobile device (Gebauer et al., 2008). This limitation, particularly the size limitation, affects the advancement in some of the key parameters in mobile device.

The most relevant parameter to the study of VM is the display or visual output of mobile device. Various researches have concluded that smaller screen reduces effectiveness and visual comfort. Chae and Kim (2004) argue that these findings may not be directly applicable to mobile. They argue that there are many additional parameters, such as the types of task and navigation, which indicate the absence of direct correlation between screen size and user satisfaction in mobile device. However, looking at the evolution of mobile devices, it is hard to ignore the fact that device manufacturers continue to improve the size and quality of the visual output element of their phone as illustrated in Figure 12. With the abundance of new applications, services, and

contents, innovators are finding ways to improve visual experience while at the same time are limited by the portability constraint.

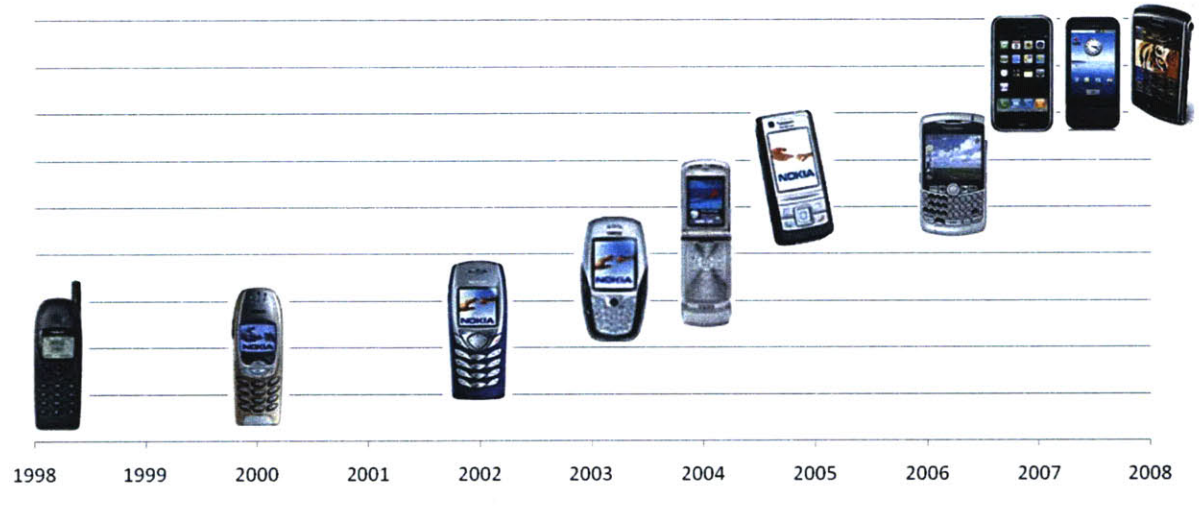


Figure 12: Trend in Display Area⁵

Mobility and Task Simplicity

While mobile technology continues to offer more services through sophisticated applications, it is still important to remember that users of the technology are usually mobile. It is true that mobile devices are also used when users are immobile, but research still shows that mobile users in general have short attention span because most of the time they multitask while using mobile devices. Chae and Kim (2004) also emphasize the importance of “instant accessibility” and argue that overly-complex task in certain situation often hinders users from taking full advantage of the mobile feature. This affects many aspects of device parameters, primarily the applications/service offerings and the input capabilities.

⁵ Multiple Sources

Even with the attempt to include vast amount of interactive applications in mobile devices, the simplicity requirement still limits the level of engagement that application developers can expect from mobile users. As an example, although the growth of gaming applications in mobile devices is enormous, Leavitt (2003) still acknowledges the argument that people play mobile games mostly “when they’re mobile and can’t do anything else.” Thus, while providers may be very ambitious in delivering feature-rich devices and applications, they are also limited by the simplicity requirement from mobile users.

In addition to cognitive simplicity, the mobility nature of the device usage also requires that the input mechanism be simple enough for use on-the-run. As users become more accustomed to standard-sized QWERTY keyboard in personal computers, innovators continue to find ways to allow equally fast and easy method for text input in mobile devices. The mobility limitation constrains innovators in this process of developing fast and comfortable text input mechanism. As an example, the foldable keyboard is a portable and more ergonomic way for mobile text input, but it is not always usable particularly when users are walking because such keyboard needs to be placed on a flat surface (Ballard, 2007).

Privacy and Security

Lastly, probably the most difficult limitation to measure is the issues in privacy and security. While users begin to enjoy accessibility of information and convenience, their information is gradually becoming more accessible to outsiders and more susceptible to malicious acts. As an example, location-aware services can provide valuable information about businesses around the geographical position of the user, but it also means that these third-party services have knowledge of users’ location at any given time. The availability of Bluetooth in

many types of portable device also allows new technological innovations through the interconnectivity among these devices. For example, it can be used to connect a mobile phone to other devices, to other phones, or used to form ad-hoc networks. Despite the seemingly convenience features, there are risks associated with them such as network ‘sniffing’ and malicious attack to unauthenticated point of entry (Ghosh and Swaminatha, 2001).

Arguably, innovations in security measure continue to evolve, and so do privacy regulations. However, they often lag behind the fast-paced innovations in technology. The mandatory ‘privacy policy’ statements are often ignored, and particularly with the small display of mobile devices, it is even more unlikely for users to review the statements (Vainio, 2001). Consequently, privacy and security will continue to be one of important limitations in the advancement of mobile technology.

4. CURRENT AND FUTURE MOBILE DEVICE TECHNOLOGY DOMAIN

4.1 Eras in Mobile Device Technology

With the above analyses of mobile device technology, the trend in the domain can be divided into four different Eras: Communication, Productivity, Multimedia & Entertainment, and Information Accessibility, illustrated in Figure 13. This doesn’t imply that a particular era ends when the next one begins. The beginning of a new era is indicated by a radical change or breakthrough innovation in the domain that significantly affect the way mobile devices are used, while incremental innovation continues to shape technologies from previous era. These notable changes also include innovations outside mobile technology domain that directly affect the evolution and trend in mobile devices.

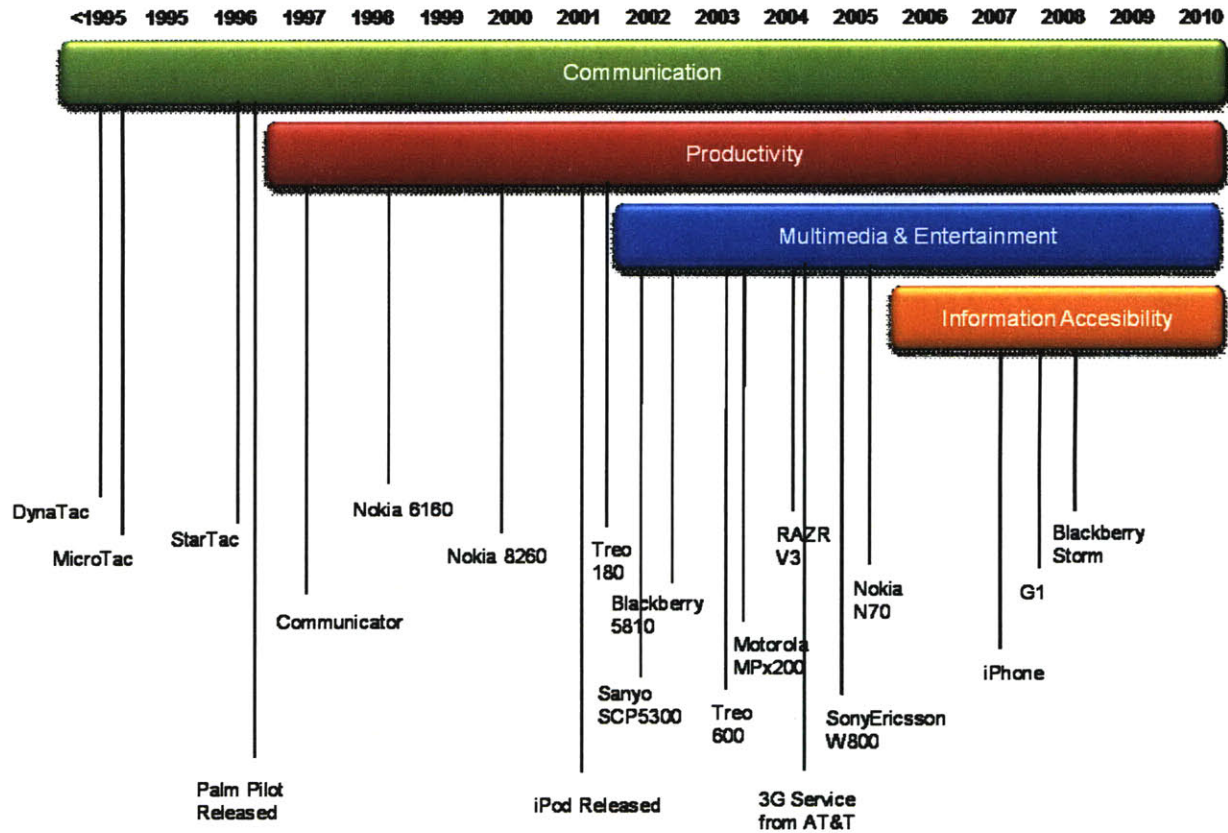


Figure 13: Eras in Mobile Communication

Communication Era of mobile device technology innovation began when the first mobile device was released, and still continues to present time. Devices in early stage of this era focus on enabling mobile users to communicate, both via voice or text messages. Notable innovations early in this era were primarily in the size and form-factor of the devices, allowing users to communicate in more portable ways. Innovations in communication still continue to present time, but most users demand greater capabilities in a device beyond simple voice and text communications.

Productivity Era begins around 1997 with the release of Palm Pilot, the portable productivity device, or known as Personal Digital Assistant (PDA). PDA devices are usually capable of, among others, emails, organizers, and comprehensive address book. There were other portable productivity devices released before Palm Pilot, but many consider the innovations too advanced for the market at that time. Although Palm Pilot is not a mobile phone, the success of the product marks the beginning of users' interest in portable productivity devices, and attracts innovators to develop integrated productivity and communication tools. Even the low-end phones in this era usually had some degree of productivity capabilities, such as simple organizers.

Multimedia & Entertainment Era doesn't have a clear beginning in the evolution of mobile device technology, partly because most devices in the earlier eras already have at least some degree of multimedia capabilities such as simple games and ringtone customizations. However, when camera phone was released, innovations in the quality of image and display screen also accelerated more rapidly, allowing better multimedia experience. Also seen in this era is continuous integration of various productivity and entertainment capabilities into a single device. Even when productivity capabilities are often associated with business users and multimedia with general consumers, many users begin to demand a single device that includes all capabilities.

Information Accessibility Era is marked by the widespread of 3G-capable devices combined with the availability of 3G service in the U.S. Shortly before the introduction of iPhone, manufacturers already began releasing devices that are capable of various internet activities. With the release of iPhone and its development platform, the accessibility of information is accompanied by the rapid advancements of mobile software applications. This era

is still in its early age by the time this research is conducted. Many providers have not yet rolled out the 3G service nationwide, and many have just recently done so with limited adoption.

4.2 Current State

The Current Era

As the Information Accessibility era begins, improvements in Communication, Productivity, and Multimedia continue to occur. While users begin to show interest in a mobile device that provides them with access to information, they are still highly receptive to improvements in the multimedia, productivity, and communication components of the device. Information Accessibility era has affected mostly early adopters, partly due to the limitation of service, while larger portion of mobile users are still enjoying the multimedia & entertainment offerings in their devices. For example, most of the top downloaded iPhone applications fall under Multimedia & Entertainment category as shown in Figure 14. In addition, the terminologies used to define the earlier eras have also expanded beyond the original concept. Communications extend beyond voice and text messages, to include social networking, for example, while productivity includes various utilities beyond common business tools, as shown in Figure 15.



Figure 14: Top Applications in iTunes – Retrieved April 2009

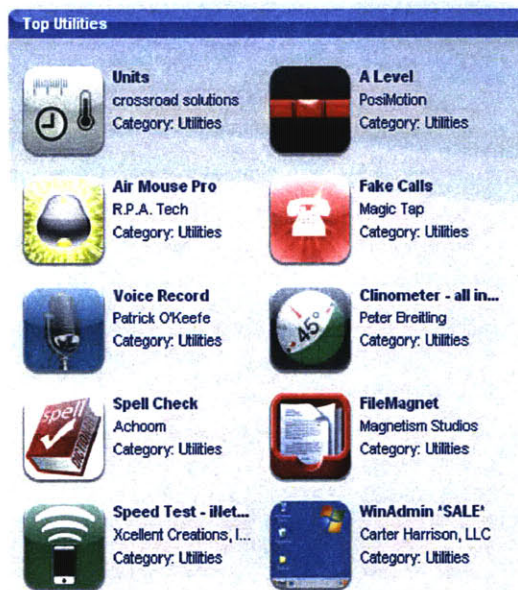


Figure 15: Top Utilities Applications in iTunes – Retrieved April 2009

Current State of Key Parameters and Adoption

As of 2008, there are about 270 millions wireless subscribers, or mobile device users in the U.S. Although these users carry a wide variety of devices, most of the currently available mobile devices have common input and output capabilities varying in quality. In addition to voice and text inputs, about 46% of U.S. households own camera phones as of 2007⁶. This also shows that majority of the devices have color screens capable of displaying images. Other capabilities such as Bluetooth connectivity, voice command, and RFID are available in most high-end phones, but the utilization is still fairly limited. The most recent radical change in the mobile device domain is the release of iPhone, introducing innovative touch form-factor, accelerometer, and a rapidly-expanding collection of third-party applications. Other manufacturers have also begun to release devices with similar form factor and features set.

Although users often experience slow performance of rich-content processing in mobile devices, many newer devices have comparable performance to that of personal computers. For example, iPhone has the maximum storage capacity of 16GB. iPhone's performance on processing multimedia content is also considered comparable, or better, than some of the well-known portable gaming consoles (Patterson, 2008). However, given the rapid trajectory in the number and types of available applications, the hardware capability needs to improve at the pace that is fast enough to satisfy the demanding applications. Similarly, power capacity in mobile devices is no longer measured only by the talk-time, but also by internet, video, and audio processing time. Most devices available today require recharging after 1 – 2 days of normal use.

⁶ 2008 PMA U.S. Digital Imaging Survey. Retrieved from: <http://pmaforesight.com/2008/03/25/camera-phone-penetration-still-on-the-rise.aspx>

The available applications vary among devices, but majority of non-iPhone devices have messaging, multimedia, and productivity applications specific to the platform/OS of the device. Most of the ‘high-end’ devices also offer internet browsing capabilities. iPhone users have a wider array of applications, and other manufacturers are now following this trend by offering more comprehensive platforms for developers and users. As of February 2008, less than 50% of the devices offered in U.S market support 3G data speed, as shown in Figure 16, while nearly all major service providers offer or begin to offer 3G data service, as shown in Figure 17. Lastly, the market of mobile Platform/OS is showing the shift from a dominance trend by Symbian, to a more fragmented market, with new players, such as Android, have just entered the market.

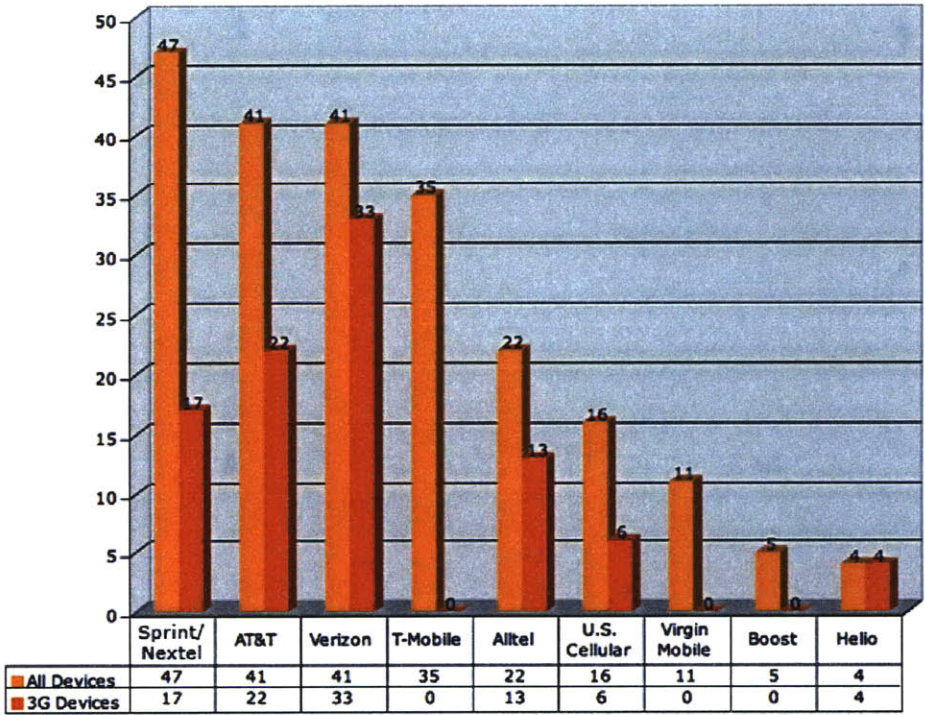


Figure 16: Number of Devices with 3G Capability⁷

⁷ Mobile Research, <http://www.mobileresearch.com/statistics.html>

Country	Operator	UMTS Status	Start Date	EDGE	HSDPA Status	Start Date	HSUPA
North America							
Canada	BCE	Planned	N/A		Planned		
Canada	Rogers Wireless	In Service	Nov-06	EDGE	In Service	Nov-06	Jul-08
Canada	Telus	Planned	N/A		Planned		
USA	AT&T	In Service	Jul-04	EDGE	In Service	Dec-05	Nov-07
USA	Cincinnati Bell Wireless	In Deployment	2009	EDGE			
USA	Stelera Wireless / Data Only	In Service	Dec-07		In Service	Dec-07	Dec-07
USA	T-Mobile USA	In Service	May-08	EDGE	In Service	May-08	Planned
USA	Terrestar	In Deployment	2009		In Deployment	2009	

Figure 17: Status of 3G Service in the U.S. by Providers⁸

To understand the current state of mobile communications, it is equally important to look into the actual usage and adoption of these advancements in mobile device technology. As of second quarter of 2008, mobile subscribers in the U.S. sent/received on average 357 text messages, and made/receive on average 204 phone calls monthly (Reardon, 2008). While wide-adoption of SMS is fairly obvious, other services, such as mobile internet, are used primarily by the early adopters. Figure 18 illustrates this adoption level by calculating the portion of mobile users which perform particular activities in their mobile devices.

⁸ Global UMTS & HSPA Operator Status, Retrieved From: http://www.3gamericas.org/documents/Global_3G_Status_Revision1-April_14_09.pdf

Mobile Subscriber Monthly Consumption of Content and Applications M:Metrics Benchmark Survey: March 2008							
	US	EU	FR	DE	IT	ES	UK
Total mobile subscribers (13+)	226 m	224 m	46.5 m	49 m	47 m	34 m	47 m
Watched video	6.0%	9.2%	7.3%	6.2%	11.2%	12.8%	9.4%
Listened to music	7.4%	17.9%	16.1%	17.6%	14.7%	22.5%	19.9%
Accessed news/info via browser	13.7%	9.5%	10.1%	5.7%	7.8%	7.2%	16.3%
Received SMS ads	19.2%	49.6%	63.5%	29.7%	53.9%	73.0%	35.4%
Played downloaded game	9.0%	8.3%	4.4%	7.3%	9.0%	11.4%	10.3%
Accessed downloaded application	4.9%	2.9%	1.8%	2.6%	4.1%	2.5%	3.4%
Sent/received photos or videos	23.0%	27.6%	25.0%	20.9%	32.0%	31.0%	30.2%
Purchased ringtones	9.2%	3.8%	4.1%	3.6%	4.0%	4.1%	3.2%
Used email	12.6%	8.6%	6.5%	7.2%	11.2%	9.1%	9.1%
Accessed social networking sites	4.8%	2.8%	2.4%	1.3%	2.7%	2.5%	4.9%

Source: M:Metrics, Inc., Copyright © 2008. Survey of mobile subscribers. Data based on three-month moving average for period ending 31st March 2008, mobile subscribers in France, n = 12,941 Germany, n = 15,119; Italy, n = 13,548. Spain, n = 12,434. United Kingdom, n = 16,192, United States, n = 30,931.

Figure 18: Utilization of Mobile Device Features⁹

Analysis of Limitations

The remaining question is whether the current state of the technological innovation has reached the limitations described in previous chapter. In judging the portability of current devices, an element of The Carry Principle (Ballard, 2007) which requires device to be portable enough to fit one's pocket is used as an approximation. Thus, it can be observed from some of the latest mobile devices such as iPhone and G1 that they are relatively near the portability limit. In those devices, the display screen occupies the majority of the surface area, and developing a significantly larger display that doesn't compromise the portability may require innovative form-factor. Similarly with processor, memory, and power capacity, these components directly affect the size of the device. However, as can be seen in the evolution of these parameters, there are still rooms for improvement in the performance and the size at the same time.

⁹ M-Metrics, Retrieved From: <http://www.marketingcharts.com/wp/wp-content/uploads/2008/05/m-metrics-mobile-content-application-consumption-us-uk-eu-march-2008.jpg>

In regards to task simplicity, there are still many opportunities to develop simple new applications or simplified versions of existing applications. However, when reviewing the text input capability and mobility limitation, latest key input mechanisms are not expected to change significantly. The QWERTY input found in recent devices has resembled the regular keyboard which users are most familiar with, and there is little room to increase the size while still allow the single-hand operation. Ballard (2007) also suggests that there are potential areas of improvement on the types of input capabilities, to allow simpler mechanisms in retrieving external information than through user's text input.

Privacy and Security are both difficult realms to study. Defining the terminologies alone is a complex process with conflicting opinions from researchers. One general conclusion that can be inferred from various studies is that users are increasingly willing to share personal information but they want to have certain control over which information is visible by which group of people. However, as the process of controlling this privacy level becomes more complex, users are often unaware of the visibility of their personal information. Many new regulations and campaigns are directed toward raising awareness of this information visibility, but most of them are directed toward the safety of minors and sensitive information such as financial (Barnes, 2006). Thus, as can be observed from various social networking sites, information about preferences and other non-sensitive information are becoming more accessible. For example, the 1 Million users in the first week of Google Latitude's introduction in 27 countries, including the U.S.¹⁰, suggests the viability of location-aware even when most people still think that it's an invasion of privacy.

¹⁰ Google: A Million Users for Latitude in Week One. Retrieved From: <http://localmobilesearch.net/news/social-networks/google-million-users-latitude-week-one>

4.3 The Future

The Information Accessibility Era

There are unlimited possibilities in the future of mobile technology, but with the knowledge of the evolution and limitations, predictions on various aspects of the domain can be derived. In particular, this analysis is focused on the emerging patterns in this information accessibility era which has just begun. As discussed in previous section, the communication, productivity, and multimedia value of mobile devices continue to evolve and strengthen rapidly rather than to fade. Information accessibility enhances these values by providing more options for users to communicate more easily, more productively, and to be better entertained. More importantly, since many still perceive mobile devices as tools for communication purposes only, information access to these users primarily means better access to information about people with whom they wish to communicate. This phenomenon is particularly important for the study of VM since it affects not just early adopters, but the majority of users and their communication pattern.

Key Parameters

Some of the key parameters are expected to undergo radical changes. Text input is advancing but it still demands users' close attention in entering the text. Even with the invention of technologies such as predictive text or voice recognition, users still have to check the accuracy of the input (Ballard, 2007). In the mean time, more sophisticated applications often require various text inputs, such as web addresses, information updates, etc. This triggers innovations for various non-text inputs such as Bluetooth and context-aware technologies, and such technologies will continue to emerge. The display capability, on the other hand, is facing the portability

limitation. Even with innovations in portable large displays like foldable screens, such technologies are primarily intended during non-mobile uses of the device. An example is the ‘pervasive display’ that separates the display unit from the actual device itself (Kwon, 2004). Thus, users will continue to work with small display screen while they are mobile. As these changes are incorporated into future devices, it is also expected that newer form factors will emerge to incorporate new capabilities and make the physical device more portable.

Hardware operation parameters are expected to evolve further in their performance metrics, such as application processing speed. While there is a physical limit on size, operational performance can be improved by innovations in the configuration of existing components. iPhone, for example, integrates discrete components in order to deliver various functionalities in a small package (Patterson, 2008). Additionally, battery technology also continues to evolve with innovations in electrochemical composites aiming to increase energy density. While innovations in electrochemical may not evolve at the same pace as in the other components, other components are also continuously improved to reduce power requirement.

Mobile devices in the U.S. market have historically been equipped with dominant platforms, such as Symbian and Java, but large players in the industry continue to move aggressively to capture more market share creating a highly-fragmented market. As a result, applications are becoming platform-specific, making various devices more incompatible with each other. While mobile users can still rely on universally available services, such as SMS, to communicate with different devices, users are offered with alternative, often better, options that are on the other hand specific to their devices and in particular their software platforms or operating systems. For example, the ‘Free SMS’ application available only on iPhone offers an alternative way of exchanging text messages.

5. CASE STUDIES

In this chapter, some of the known cases or common practices of mobile VM are analyzed using the previously-identified VM criteria. The study excludes examples that don't directly utilize mobile devices in the transmission process, such as those that involve texting information for a sweepstake entry, or those where the possible VM aspect is only through the conventional word-of-mouth approach. It also excludes examples that trigger viral behavior through false information or hoax. Since mobile VM is still a relatively novel idea in the U.S., there are limited case examples that are useful for this study. For this reason, the analysis also includes common Mobile VM practices, such as sharing of mobile content. Outside the scope of the study is the suitability of the content itself for the goal of the marketing. Also excluded from this study are standard web-based systems accessible from mobile devices. The fact that mobile devices and personal computer are converging is not being debated, but the goal of this research is primarily to exploit the nature of mobility and the unique characteristic of mobile devices as tools for effective Mobile VM.

5.1 Snakes on a Plane

*Overview*¹¹

TagWorld, a social networking company, and VariTalk, a marketing company specializing in mobile marketing, worked with New Line Cinema before the premiere of the movie 'Snakes on a Plane' around 2006 to develop, amongst others things, a mobile phone-based marketing campaign. In this campaign, a website was setup where one could enter the target recipient's mobile number and name which were then used to compose the personalized

¹¹ The 'Snakes On A Plane' Movie Viral Campaign Questionable. Retrieved From: http://www.bizreport.com/2006/10/is_snakes_on_a_plane_movie_campaign_questionable.html

voice call. The recipient received a normal phone call, but was ‘surprised’ by a recorded voice of the leading actor of the movie, Samuel L. Jackson, calling the recipient by name and reminding the date of the movie premiere. These recipients could then go to the website, and do the same to their friends. Reportedly, about 1.5 millions calls were placed within the first week of the campaign. While the campaign included other components such as ringtone and wallpaper sharing, the assessment is done only on this phone-call approach.

While many articles consider this as an example of Mobile VM, this arguably is not a pure Mobile VM. It is assumed that any phone numbers, including landline, could receive the call. However, this case is a good representation of the state of Mobile VM in the U.S, and thus the analysis will provide useful assessment on the effectiveness.

VM Criteria Assessment

Criteria	Rating
Transmission Convenience	Low
Reception Convenience	Medium
Potential View per Transmission	Low
Content Attractiveness	High

The creative content of this VM is relatively unique and attractive, in which the surprise element of the content triggers recipient’s interest to do the same to others. The method of ‘transmitting’ the message requires users to go to a website and enter the information. Assuming the location of the website is not mentioned in the call, they need to first find the location by asking or web-searching. This is a relatively substantial amount of work in the transmission process, especially if they have to use a different device such as personal computer to perform this action. Receiving the message via the voice call is relatively simple, but it is involuntary and

requires attention shift for multitasking recipients, which is not always welcomed. Every transmission requires user to enter a phone number and name, thus it is fair to assume that every 'transmission' of message only has one potential recipient or 'view'. This is a Push-VM, and due to the personalization and mischievous nature of the content, it is normal to have small potential 'viewers' per transmission. A Pull-VM may be difficult to implement for the same content. The VM's success is highly contributed by the attractiveness of the content, but it also has the potential of taking bigger advantage of mobile technology, particularly to make the transmission process easier. For example, an SMS text message may follow the phone call with instruction on how to set up the call, also through text message. This allows recipients to immediately become transmission agents without having to wait for access to internet or computer. However, in any cases, the main shortcoming in such VM strategy is the complexity in its message transmission process, which requires close attention from the agents.

5.2 SMS Text Messages

Overview

Businesses often consider Text-Message or SMS marketing as 'the next best thing' to email marketing. The process begins by sending a list of mobile numbers a text message with information about a product, service, or event. These numbers are obtained either from mobile users who explicitly subscribe to receive advertising messages, or from service providers who sell the numbers of their customers, except for those that specifically 'opt-out' from receiving advertising messages. The intended goal is continuous viral transmissions of the message starting when these initial recipients forward the information to their acquaintances.

VM Criteria Assessment

Criteria	Rating
Transmission Convenience	Medium
Reception Convenience	Low
Potential View per Transmission	Low
Content Attractiveness	Low

Forwarding a text message is a fairly simple process as suggested by the high volume of text messages per user in the U.S, compared to voice calls. Although receiving a text message is a relatively simple process as well, mobile users are faced with monetary cost associated with received messages. In fact, 71% of 809 respondents in a survey on mobile marketing strongly agree that marketers are responsible for the cost associated of marketing messages received in customers' devices¹². Also, with the 160-character limit, it is difficult to compose an attractive SMS message. Thus, attractive SMS messages are usually those that are relevant to the recipients' interests. Even when users voluntary subscribe to receive marketing messages, constant irrelevant messages could easily disinterest users from the subscription. Accordingly, an agent usually forwards, or transmits, the message only if it's deemed relevant to the recipient.

5.3 Mobile Multimedia Content

Overview

In addition to text messages, advancement in mobile devices allows various types of multimedia content to be utilized as VM messages. The content is virally transmitted when an agent showcases the content in his/her mobile device, such as via ringtone and wallpaper, and

¹² ExactTarget Survey. Retrieved From: <http://blog.exacttarget.com/blog/morgan-stewart/0/0/great-quote-you-milk-the-cow-once-its-grown-not-after-its-just-been-weaned>

potential recipients show interest for the content by asking the agent to share it or by downloading it from the internet. This is largely enabled by multimedia capabilities in most devices and MMS service that allows sharing of content. Heterogeneous software platforms and content type compatibility create a rather complex environment for content distribution to devices with different platforms or software versions. Nevertheless, prevailing ‘standards’ are adopted by large-enough users to be deemed valuable by marketers.

VM Criteria Assessment

Criteria	Rating
Transmission Convenience	Low
Reception Convenience	High
Potential View per Transmission	Medium
Content Attractiveness	Medium

The transmission process begins when the agent decides to save a multimedia and activate it in his/her device. Although playing ringtone and displaying wallpaper in the device may appear to be a simple process, the whole transmission process actually involves the setup process. In the case of sending the content, the process also involves figuring out whether the recipients have the required service and compatible software for the content. Receiving the message only requires the presence of the recipients near the device playing the multimedia. This includes random people outside the agent’s social circle. It may seem that there is a potentially high number of ‘views’ in every transmission. However, most of multimedia content in a device is only noticeable within a very close proximity of the device, limiting the number of potential views. The multimedia content can potentially be very attractive, but most content like ringtones are increasingly becoming commoditized.

This VM is a combination of Push and Pull-VM. An agent can either push the content such as sending a wallpaper image via multimedia messaging, or simply broadcast the content such as using a commercial ringtone in the device, allowing potential recipients to pull the content by inquiring about it. In the case of push transmission, the process is similar to that of sending text messages, thus the analysis here is geared toward the Pull-VM type. The viral transmission aspect of this VM strategy still mostly depends on an agent's social network. Although it has the opportunity of public exposure, it is still more common for the recipients to ask the agent about the content if they are acquaintances. Additionally, the process in obtaining the content from the source is still considered a complicated process (Martin and Weiss, 2006). Thus, it is even less likely for potential recipients to make the effort in finding the source of the content without asking the agent. Consequently, the actual transmission process also becomes complicated because recipients have to go through several steps including the download, to activate the content in their devices and make them transmission agents.

6. STRATEGIC IMPLICATION

6.1 Technological Fit of Current Mobile VM Strategy

As can be seen from the case studies in previous chapter, the existing Mobile VM practices typically follow the same strategy as that of the regular non-mobile VM. Regardless of the transmission process, the overall VM strategy involves content being transferred from one physical device to another, such as text message and multimedia. The 'Snakes on a Plane' case is an exception, but this case is not considered a pure mobile VM. Additionally, just like the general concept in word-of-mouth, the strategy focuses on an agent's social network and rarely

extends beyond. Most importantly, the existing strategy relies heavily on the role of VM agents in the transmission process of the message. Recipients generally play passive role and only wait for incoming messages from agents. In other words, the strategy is primarily of a Push-VM type. The summary of current mobile VM strategy is summarized in Figure 19. Several gaps between the strategy and the state of mobile technology are uncovered when putting together the analysis on technological innovation and the characteristic of current mobile VM strategy.

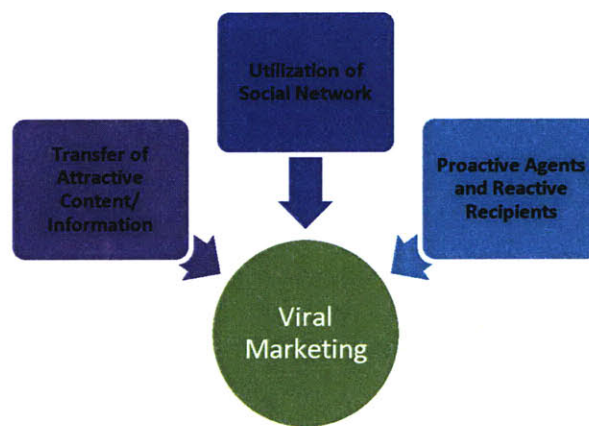


Figure 19: Current Mobile Viral Marketing Strategy

Proactive Agents and Reactive Recipients

The primary input capabilities in currently available mobile devices are text and voice. As discussed in Chapter 3, limited capability in the keypad combined with small display screen makes it even more difficult for mobile user to commit their attention to the device. Meanwhile, the existing Mobile VM strategy usually involves multiple steps in the transmission process, demanding close attention from an agent. This creates hindrance in potential agents' willingness to transmit seemingly unimportant messages they receive. Furthermore, since only agents are proactive in the process of message transfer, recipients receive messages not at their will. Although recipients generally don't have to perform complex steps in the process, messages

received at less convenient moments are easily dismissed. This is also attributed to the small screen and attention requirement to view any incoming messages or content.

Social Network

The focus on an agent's social network is particularly difficult to implement in current mobile technology domain due to a heterogeneous distribution of technology and service among the members of the social network. As an example, not all members in a network have MMS service or MMS-capable devices, and the quality of the multimedia applications also vary. Consequently, marketers often rely on basic services, such as SMS, which have been adopted by majority of device owners. However, the adoption of new services doesn't always follow the same pattern. New competing services often emerge even before the old services gain widespread adoption. As discovered in Chapter 3, services such as MMS can be substituted by data services that allow faster web-based applications for multimedia exchange.

Transfer of Content

Besides the size of the physical devices, most of the currently available mobile devices also have limited memory size or storage space. When transmission of a VM message involves transfer of content such as text message or multimedia to a recipient's device, the recipient needs to allocate memory space by either deleting old content or dismissing the newly received one. When users have to deal with multiple messages, it can easily lead to clutter, causing users to be less receptive of VM messages, or the notion of spam. Combined with the mobile device technology characteristic described above such as the small size, it is assumed that users are more sensitive to spam in mobile context especially when compared to personal computer. As a

result, this concern of spam also creates hindrance for VM agents in freely sharing attractive content to members of their social network.

6.2 Strategy Framework

One may argue that the anticipated technological advancement in mobile device domain will be able to address some of the gaps described in previous section. However, considering the limitations in this domain as described in Chapter 3, such as portability, the same VM strategy is likely to encounter the same challenges. Other anticipated changes in the domain, such as the increasingly fragmented platform market, can potentially create even greater complexity in implementing the current VM strategy. Using the existing strategy as a basis of analysis and the anticipated development of key parameters in the future, a strategic framework is constructed to provide the basis for new VM approaches in mobile device technology domain. The framework is summarized in Figure 20, along with specific supporting strategies that connect the framework to the key technological parameters.

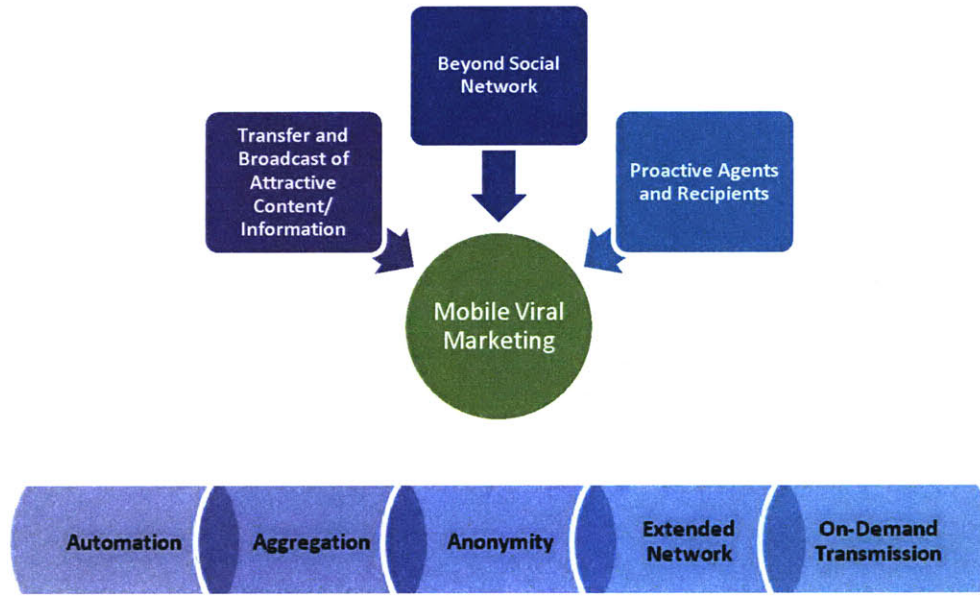


Figure 20: Strategic Framework for Future Mobile Viral Marketing

The primary difference between the new framework and the existing strategy is the emphasis in leveraging Pull-VM. However, this Pull-VM strategy does not simply follow the common practices in web-based systems since mobile users have limited capacity in providing text input. Thus, supporting strategies namely Automation, Aggregation, and Anonymity, are being introduced in this framework to allow more seamless transmission process for the agents. In this framework, as Pull-VM type suggests, recipients also play more proactive role in the process and pull messages at-will. Lastly, this framework also proposes a different perspective of viral distribution network that extends beyond social network. As can be seen in other forms of electronic communications, consumers no longer seek information solely from their social networks. The supporting strategies are discussed further below.

Automated Input

Even with the introduction of various form factors to allow simpler operation of mobile devices, users still have to type with one or two fingers most of the time and with short attention span. As discussed in Chapter 3, even newer technologies that allow simpler mechanisms in text input are not optimal. This constrains the dynamic of information sharing in this era. As users become increasingly expressive and eager to share various types of real-time information about themselves and their surroundings, non-text input mechanisms need to be incorporated in the process. This is consistent with the observation from Chapter 4 which suggests that the mobility limitation necessitates other forms of input capabilities in the near future of mobile devices. Such capabilities can be in the form of physical sensor attached to the device, or through information available in the services that users are subscribed to. Early adopters have started using services such as location-aware service by Google Latitude introduced in the beginning of 2009. This can be considered an automated input since users no longer have to type in their locations, and allow the service to broadcast that information.

Anonymity & Aggregation

In this era of information accessibility and privacy concern, one strategy that increases the willingness of users to broadcast certain information is the option of anonymity. As an example, new restaurants may utilize RFID interface, combined with supporting services, to encourage users to tap their device as a way to share information to their network about the visit and the foods they ordered. Some visitors may be willing to do so only if there's an option of anonymity. Such anonymous sharing can be complemented with aggregation mechanism to create more valuable information. For example, the visible information can be limited to the total

number of members in the network that have visited the restaurant, with the option of viewing the information of the non-anonymous contributors. The anonymity and aggregation strategies are also useful in Push-VM to lessen the spam concern. As electronic communication allows constant interaction among individuals with weak ties, it creates a potential for an indirect recommendation system. For example, an agent can anonymously suggest a new restaurant to the members of his network who live in a particular area, regardless of tie strength.

Extended Network

Current mobile VM strategy relies on social network for message distribution. As discussed in Chapter 4, this strategy becomes increasingly difficult to implement given the heterogeneous platforms. However, this heterogeneity creates another opportunity to utilize different kinds of network. One of the possibilities is a type of network referred here as technology or technical network, which is a group of users of mobile devices that share one or more common technical platform such as OS, applications, or services. This type of network has become more evident with the fragmentation of mobile platforms, such as a network of iPhone users. Marketers can leverage technology network to distribute the message among members of the network who may not even have any social ties. For example, an iPhone user, a potential VM agent, discovers an attractive commercial video of a race car, and the agent recommends it to all iPhone users who currently have one or more racing app via a special recommendation system. Recipients can then recommend it to other iPhone users with other combination of characteristic. The concept is similar to that of recommendation engine in online retail, but in mobile context, it can potentially be extended to physical products/services. In addition to technology network, non-social networks also include groups of people with various commonalities, such as interest

and geographic location. A sample of such network can be seen in Facebook online platform where various types of networks available, such as geographical and institutional.

On-Demand Transmission

In this era, mobile users are looking for information, and it includes information that enhances their communications. In other words, they seek information about other people, both people within and outside their social networks. This is the underlying reason of the emphasis on Pull-VM in the new strategy framework. Although Pull-VM may seem to decrease reception convenience in the process, but the evolution of mobile display parameter provides options for better viewing experience when users are not mobile. As discussed in Chapter 4, portability limitation of mobile devices has begun to push innovation in expandable display, such as foldable or 'pervasive' display. This means that recipients have the option to retrieve the VM messages only when they are not busy or mobile, and with the expanded display activated, the viewing convenience is improved.

7. CONCLUSIONS

Traditionally, mobile communications have mostly been associated with communications among members within a small social network. Onnela et al (2006) supports this with their finding that "users spend most of their on-air time talking to members of their immediate circle of friends." However, with the advancement of services and applications available in mobile devices, diffusion of information goes beyond this direct form of communication. Leskovec et al. (2007) suggests that social circle has little relevancy to word-of-mouth marketing in the Internet since recommendation system, for example, makes the information available to everyone. The

mobility nature and advancement of technologies in mobile devices make such changes in communication pattern more prevalent among mobile users. This dynamic nature of mobile communications justifies the need for new strategies that allow marketers to implement more appropriate VM practices in the future.

Although still in their infancy, many of the device capabilities and services expected in the future are readily available, such as location-based input. What's needed to leverage these capabilities as a set of VM strategies is a centralized point of control to integrate and customize them accordingly. This centralized control is a mobile application. As the trend of replicating web-applications into mobile-applications continues, businesses need to look ahead beyond existing web-applications and more towards specific applications that can utilize these unique mobile capabilities.

The key in designing such application is to understand the state of device advancement and service availabilities. For example, the emerging services currently available in mobile domain are data and location-aware services. The widely-used input capabilities are still text-input but navigation has been greatly improved by the touch-screen feature. An effective VM application may combine an automated input through location-aware service and some manual inputs through pre-defined text options, to facilitate users in sharing their experience in the physical world. Hypothetically, a restaurant chain can create such application to allow patrons to share the foods they order in a particular location and the quality of the foods, through a pre-loaded list of foods and star-rating. They may also have the option to set the visibility level of their recommendations. A potential guest to the restaurant can then use the same application to see what foods are ordered by most people, or by their immediate friends, in the restaurant that he or she is considering.

With the fragmentation of mobile platform market, the remaining question is which platform is appropriate for such application. There are applications that are common to various platforms, such as browser. However, standardization of look-and-feel is often proven not optimal especially as mobile platforms become more distinct. This is where the aggregation strategy may be leveraged, allowing application to be customized across platforms easily. With the availability of data service, inputs from various platforms can be aggregated centrally such as in the main server. The application only needs to be customized for its look-and-feel but the data can be aggregated and used across platforms. Using the same example of a restaurant chain, a user can view recommendations from other users irrespective of their mobile platforms. It is even possible to filter the recommendation by platforms, such as ‘show me recommendations from iPhone users only’. Although this may seem counterintuitive in the restaurant example, such filtering may be useful in other scenarios, especially when the products or services being reviewed are specific to the device.

While nobody can precisely predict the future of any technologies, analysis of the past and present states of mobile device technology in this research has generated significant findings that allow the construction of strategic framework for Mobile VM. This framework can then be translated into a mobile application that integrates the available capabilities and services as illustrated in the above example. A well-crafted VM application that fits the marketing goal can become another source of competitive advantage for a business.

7.1 Future Works

Although the research was conducted from the perspective of mobile device technology, there are many other aspects that contribute to the formulation of an effective VM strategy. The

complex business ecosystem of mobile industry creates interrelated relationships among different players that affect the behavior of mobile users. One important aspect to be explored in future research is financial, such as the Average Revenue Per-User (ARPU) that affects the distribution of services by providers, and how adoption of technological advancements is affected by such factors. Finally, further exploration on the socio-behavioral aspects can be done to further analyze the correlation between improvement in technological parameters and the increased willingness of mobile users to share their experience.

APPENDIX

Appendix A: Compiled Technical Data of Sample Devices

		Weight (gr)	Width x Length (mm)	Thickness (mm)	Talk Time (minutes)
1983	Motorola DynaTac 8000X	793	14693.9	88.9	60
1989	Motorola MicroTac 9800X	348.7	9809.8	31.8	90
1996	Motorola StarTac	88	5170	19	180
1997	Nokia 9000, Communicator	397	11072	38	180
1998	Nokia 6160	170	6110	28	198
2000	Nokia 8260	96	4784	20	198
2001	Handspring Treo 180	153	7521	18	150
2002	Sanyo SCP-5300	117	4512	27.9	162
2002	Blackberry 5810	133	9184.5	18	240
2003	Treo 600	167.3	6819.8	22.9	360
2003	Moto MPx200	118	4249.42	26.9	255
2004	RAZR V3	95	5390	13.9	402
2005	W800	99	4600	20.5	540
2007	iPhone	135	7015	11.5	480
2008	G1	158	6555.89	17.1	406
2008	Blackberry Storm	155	6997.5	14	360

(Source: Multiple Sources)

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