
Abstract

A smartphone contains advanced computing capabilities that are attractive to users, and it arose as the outcome of the marriage of the existing mobile phone technology and PDA technology. A smartphone is more than a mobile device for making and receiving calls, and it is essentially a touch-based computer on a phone, which comes with its own keyboard, operating system, Internet access and third-party applications. It provides many other features such as a camera, maps, calendar, alarm clock and games. Today, the smartphone is ubiquitous.

We discuss the impact of Facebook and Twitter in social networking. Facebook is the leading social media site in the world, and it has become a way for young people to discuss their hopes and aspirations as well as a tool for social protest and revolution. Twitter has become a popular tool in political communication, and it is also an effective way for businesses to advertise its brand to its target audience.

Key Topics

PDA
Smartphone
Facebook
Tweets
Twitter

15.1 Introduction

Smartphones arose as the outcome of the marriage of the existing mobile phone technology and PDA technology, and they contain advanced computing capabilities that are attractive to users. Today, the smartphone is ubiquitous, with most people in advanced countries owning one.

We consider some of the events that led to the development of the smartphone, such as the introduction of the PDA by Apple and Palm. The introduction of the smartphone facilitated a major growth of social networking, as users were now able to communicate news events or update their personal information in real time. Social networking sites such as Facebook and Twitter have transformed human communication.

Social media involves the use of computer technology that allows the creation and exchange of user-generated content. These web-based technologies allow users to collaborate to discuss and modify user-created content. It has led to major changes in communication between individuals, communities and organizations.

Facebook helps users to keep in touch with friends and family, and it allows them to share their opinions on what is happening around the world. Users may upload photos and videos, express opinions and ideas and exchange messages, and Facebook allows their community of friends to be actively kept up to date on important events in their lives.

Facebook has become an important communication channel for educated young people to discuss their aspirations for the future, as well as their grievances with society and the state. It has even become an effective tool for protest and social revolution.

Twitter has become an effective way to communicate the latest news, and its effectiveness as a communication tool increases as the number of a person's followers grows. It allows a person or organization to determine what people are saying about it, including their positive or negative experiences. This allows direct interaction with the followers, and so it is a powerful way to engage the audience and to make people feel heard.

15.2 Evolution of the Smartphone

A smartphone is more than a mobile device for making and receiving calls, and it is essentially a touch-based computer on a phone, which comes with its own keyboard, operating system, Internet access and third-party applications. It provides many other features such as a camera, maps, calendar, alarm clock and games.

IBM (in a joint venture with BellSouth) introduced one of the earliest precursors of today's smartphones in 1993. This was the IBM Simon, and it included voice and data services. It acted as a mobile phone, a PDA and a fax machine, and it also included a touchscreen that could be used to dial numbers. It could send faxes and emails, as well as making or receiving calls, and included applications such as an address book, calendar and calculator. However it was an expensive and large bulky device, and it was priced at \$900.

John Sculley, the CEO of Apple, coined the term *personal digital assistant*, and Apple introduced the first PDA, the Newton, in 1993. The Apple Newton included some nice features including limited handwriting recognition abilities. Xerox PARC had created a prototype PDA, the Dynabook, in the 1970s, but they did not commercialize it.

A PDA allows a large amount of data to be stored on a small handheld device. Palm introduced an early PDA device, the Palm Pilot 1000, which was used for mobile data, and it was introduced in 1996. It played an important role in popularizing the use of mobile data by business users. The Palm Pilot started the PDA industry, and it included 128Kb of memory and 16 MHz of processing power. It had better handwriting recognition capabilities than the Newton and a graphical user interface (GUI).

The Nokia 9000 Communicator was released in 1996, and this phone combined the features of a PDA and a mobile phone. It included a physical QWERTY keyboard, and it provided features such as email, calendar, address book and calculator. However, it did not provide the ability to browse the web, and a colour display was introduced in the Nokia 9210 in 1998.

Qualcomm introduced its pdQ smartphone in 1999, and this phone combined a Palm PDA with Internet connectivity capabilities. Research In Motion (RIM) released its first Blackberry devices in 1999, and these provided secure email communication into a single inbox. Samsung's first smartphone was the Samsung SPH-I300, which was released in 2001, and this Palm-powered smartphone is a distant ancestor of today's smartphones. Samsung introduced its SGH i607 smartphone in 2006, and this Windows-powered phone was inspired by Research in Motion's Blackberry phone.

Smartphone technology continued to evolve through the early 2000s, and Apple introduced its revolutionary iPhone in 2007. This Internet-based multimedia smartphone included a touchscreen and features such as a video camera, email, web browsing, text messaging and voice. The iPhone had a 3.5 inch 480×320 touchscreen, a QWERTY keyboard and 4GB of storage. Apple developed its own operating system, iOS, for the iPhone.

Google introduced its open-source Android operating system in the late 2007, and the first Android phone was introduced in the late 2008. Android is now the dominant operating system for smartphones and tablets, with iOS used on Apple's products. The Samsung Instinct was released in 2008, but it was based on an operating system developed by Samsung from various Java components. Although its touchscreen operating system was not in the same league as Apple's iOS, it became a competitor to Apple's iPhone.

Apple's iPhone 4 (Fig. 15.1) was introduced in 2010, and this powerful smartphone has a 3.5 inch 960×640 screen and a 5 megapixel camera. The Samsung Galaxy S smartphone was launched in 2010, and this touchscreen-enabled Android smartphone became extremely popular. The Samsung Galaxy S series of smartphones have been very successful and have become a major competitor to Apple's iPhone.

Fig. 15.1 Apple iPhone 4



Apple released the *iPad* in 2010, which is a large screen tablet-like device that uses a touchscreen operating system. Samsung is a major competitor to Apple in the tablet market.

15.3 The Facebook Revolution

Facebook is the leading social networking site (SNS) in the world, and its mission is to make the world more open and connected. It helps users to keep in touch with friends and family, and it allows them to share their opinions on what is happening around the world. Users may upload photos and videos, express opinions and ideas and exchange messages. Facebook is very popular with advertisers as it allows them to easily reach a large target audience.

Mark Zuckerberg (Fig. 15.2) founded the company in 2004 while he was a student studying psychology at Harvard University. Zuckerberg was interested in programming, and he had already developed several social networking websites for his fellow students including *Facemash*, which could be used to rate the attractiveness of a person, and *CourseMatch* which allowed students to view people taking their degree.

Zuckerberg launched *The Facebook* (thefacebook.com) at Harvard in February 2004, and over a thousand Harvard students had registered on the site within the first 24 h. Over half of the Harvard student population had a profile on Facebook within the first month. The membership of the site was initially restricted to students at Harvard, then to students at the other universities in Boston, and then to students at the other universities in the United States. Its membership was extended to international universities from 2005.

The use of Facebook was extended beyond universities to anyone with an email address from 2006, and the number of registered users began to increase exponentially. The number of registered users reached 100 million in 2008 and 500 million in 2010 and exceeded one billion in 2012. It is now one of the most popular web sites in the world.

Fig. 15.2 Mark Zuckerberg



Facebook's business model is quite distinct from that of a traditional business in that it does not manufacture or sell any products. Instead it earns its revenue mainly from advertisements, and its business model is based on advertisement revenue, with advertisements targeted to its over 1.3 billion users based on their specific interests. Facebook is essentially selling its users to advertisers (i.e. the users are the product). The users really do all the work, and Facebook collects data about them (e.g. age, gender, location, education, work history and interests) and classifies and categorizes them, so that it is in a position to target advertisements that will potentially be of interest to them. This means that the advertisements are targeted to the right audience.

Social media have become important communication channels for educated young people to discuss their aspirations for the future, as well as their grievances with society and the state. The effectiveness of Facebook as a tool for protests and revolution is evident in the relatively short protests that culminated in the resignation of President Hosni Mubarak of Egypt in 2011.

Egypt has a young population with roughly 60% of the population under the age of 30, and the country has faced many challenges since independence such as improving education and literacy for its young population, as well as finding jobs for its citizens.

Facebook provided a platform for Egyptian youth to discuss issues such as unemployment, low wages, police brutality and corruption. Young Egyptians set up groups on Facebook to discuss specific issues (e.g. a group that aimed to provide solidarity with striking workers was set up). Further momentum for revolution followed the beating and killing of Khaled Mohammed Said, as photos of his disfigured body were posted over the Internet and went viral. An influential Facebook

group called *We Are All Khaled Said* was set up, and the killing provided a tangible focus for solidarity among young Egyptians.

The protests lasted for 18 days and it led to hundreds of thousands of young Egyptians taking to the streets and gathering in Tahrir Square in Cairo. They demanded an end to police brutality as well as the end of the 30-year reign of President Hosni Mubarak. The authorities reacted swiftly in closing down the Internet in Egypt, but this act of censorship failed to stop the protests against Mubarak. Social media played an important role in mobilizing protests and influencing the outcome of the revolution.

15.4 The Tweet

Twitter is a social communication tool that allows people to broadcast short messages. It is often described as the *SMS of the Internet*, and it is an online social media and microblogging site that allows its users to send and receive short 140-character messages called *tweets*. The restriction to 140 characters is to allow Twitter to be used on non-smartphone mobile devices. Twitter has over 300 million active users, and it is one of the most visited websites in the world. Users may access Twitter through its website interface, a mobile device app or SMS.

Jack Dorsey (Fig. 15.3) and others founded the company in 2006. Dorsey introduced the idea of an individual using an SMS service to communicate with a small group while he was still an undergraduate student at New York University. The word *twitter* was the chosen name for this new service, and its definition as *a short burst of information and chirps from birds* was highly appropriate.

Fig. 15.3 Jack Dorsey at the 2012 Time 100 Gala



Twitter messages are often about friends telling one another about their day, what they are doing, where they are and what they are thinking and doing, and Twitter has transformed the world of media, politics and business. It is possible to include links to web pages and other media as a tweet. News such as natural disasters, sports results and so on are often reported first by Twitter. The site has impacted political communication in a major way, as it allows politicians and their followers to debate and exchange political opinions. It allows celebrities to engage and stay in contact with their fans, and it provides a new way for businesses to advertise its brands to its target audience.

As a Twitter user, you select which other people who you wish to follow, and when you follow someone, their tweets show up in a list known as your *Twitter stream*. Similarly, anyone that chooses to follow you will see your tweets in their stream.

A *hashtag* is an easy way to find all the tweets about a particular topic of interest, and it may be used even if you are not following the people who are tweeting. It also allows you to contribute to the particular topic that is of interest. A hashtag consists of a short word or acronym preceded by the hash sign (#), and conferences, hot topics and so on often have a hashtag.

A word or topic that is tagged at a greater rate than other hashtags is said to be a *trending topic*, and a trending topic is often the result of an event that prompts people to discuss a particular topic. Trending may also result from the deliberate action of certain groups (e.g. in the entertainment industry) to raise the profile of a musician or celebrity and to market their work.

Twitter has evolved to become an effective way to communicate the latest news, and its effectiveness as a communication tool for an organization increases as the number of its followers grows. An organization may determine what people are saying about it, as well as their positive or negative experience in interacting with it. This allows the organization to directly interact with its followers, which is a powerful way to engage with its audience and to make people feel heard. It allows the organization to respond to any negative feedback and to deal with such feedback sensitively and appropriately.

The first version of Twitter was introduced in mid-2006, and it took the company some time to determine exactly what type of entity it actually was. There was nothing quite like it in existence, and initially it was considered a microblogging and social media site. Today it is considered to be an information network rather than just a social media site.

Twitter has experienced rapid growth from 400,000 tweets posted per quarter in 2007, to 100 million per quarter in 2008, to 65 million tweets per day from mid-2010, to 140 million tweets per day in 2011. Twitter's usage spikes during important events such as major sporting events, natural disasters, the death of a celebrity and so on. For such events, there may be over 100,000 tweets per second.

Twitter's main source of revenue is advertisements through *promoted tweets* that appear in a user's timeline (Twitter stream). The first promoted tweets appeared from late 2011, and the use of a tweet for advertisement was ingenious. It helped to make the advertisement feel like part of Twitter, and it meant that an advertisement

could go anywhere that a tweet could go. Advertisers are only charged when the user follows the links or retweets the original advertisements. Further, the use of tweets for advertisement meant that the transition to mobile was easy, and today about 80% of Twitter use is on mobile devices.

Twitter has recently embarked on a strategy that goes beyond these advertisements to sell products directly (including to people who don't use Twitter). Twitter also earns revenue from a data licensing arrangement where it sells its information to companies who use this information to analyse consumer trends. Twitter analyses what users tweet in order to understand their intent. For more detailed information on Twitter, see [Sch:14].

15.5 Review Questions

1. What is a PDA?
2. What is a smartphone?
3. What is social media? Explain how sites such as Facebook and Twitter have transformed human communication.
4. Explain how a company may use social media to market new products to its customers.
5. Explain how social media has been used as a tool for protest and revolution.
6. Why has Twitter been described as the SMS of the Internet?

15.6 Summary

A smartphone is essentially touch-based computer on a phone, which comes with its own keyboard, operating system, Internet access and third-party applications. It provides many other attractive features such as a camera, maps, calendar, alarm clock and games. It arose from the marriage of mobile phone technology and PDA technology.

The smartphone has facilitated a major growth of social networking, as users are now able to communicate news or update their personal information in real time. Social media involves the use of computer technology that allows the creation and exchange of user-generated content. It has led to major changes in communication between individuals, communities and organizations. Social networking sites such as Facebook and Twitter have transformed human communication.

Facebook helps users to keep in touch with friends and family, and it allows them to share their opinions on what is happening around the world. Users may upload photos and videos, express opinions and ideas and exchange messages. It has become an important communication channel for young people to discuss their aspirations for the future, and it has also become an effective tool for mobilizing protests and social revolution.

Twitter has become an effective way to communicate the latest news, and its effectiveness as a communication tool increases as the number of its followers grows. It allows a person or organization to determine what people are saying about it, as well as their positive or negative experiences.