Chapter 15

The Society of the Internet

Learning Objectives

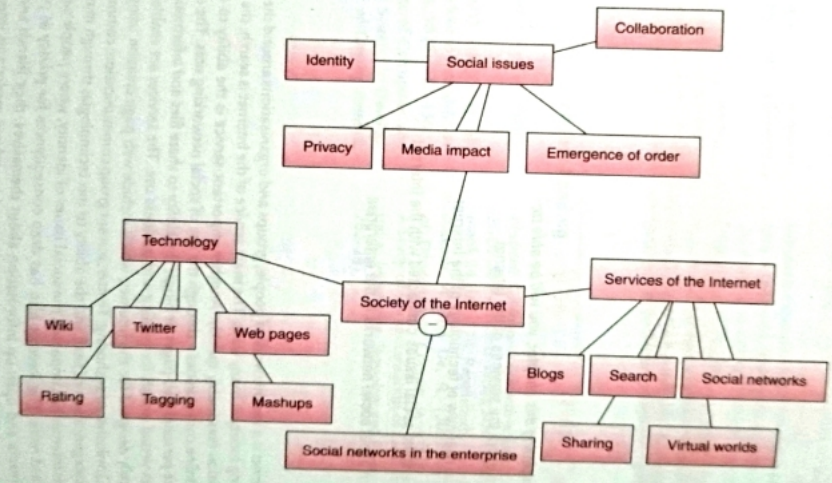
After completing this chapter, you will be able to:

- Learn about the services of the Internet
- Get an overview of technology of the Internet
- Understand social issues connected with the Internet
- Learn about social networks in the enterprise

The Internet is a vast network of people, groups and organisations around the world. It is a social force that is impacting society in many ways. The main service of the Internet is search, the ability to seek and find relevant information reasonably quickly. Another important service is the ability to network easily with others – to create online communities – through the use of social networking sites. The other services include the ability to create personal web pages or blogs, the ability to share files and information on a peer-to-peer basis, and to create virtual worlds for gaming and business use. The services are enabled by a number of technologies, specifically designed for the Internet, which include web page creation using Hyper Text Markup Language (HTML); wiki shared authoring; Twitter, instant group communication; community rating of sites; community-based categorisation of sites and the ability to mix technologies through mashups.

The Internet has impacted the social issues of identity, where people can present themselves in various forms and roles. The Internet also has deep consequences for privacy as people and organisations adopt social media and open up information about themselves, their friends and communities and their activities. Social media is also driving conventional broadcast media and impacting, practically, politics and social movements in many countries. Collaboration has taken an entirely new form through the Internet, with massive participation in creating sites such as Wikipedia and open source software, efforts that are unprecedented in history. The Internet also shows that despite the open and free nature of participation, order naturally emerges in communities.

MIND MAP OF CHAPTER TOPICS



CASE STUDY: Social Media in Political Uprising

Organising political activity requires gathering masses of people at a place for a cause, and getting across a message to them for further action. Throughout history political action has relied on leaders reaching out to people by meeting with them personally or by using media. When the political action is by those not in power, their ability to use traditional physical and electronic media is restricted. However, in the modern Internet and digital era, the conditions have changed to allow even those without power to be able to access media.

An example of this is the uprising and revolution in the small North African country of Tunisia, which erupted in December 2010. Tunisia had been ruled by a dictator, called Zine el-Abidine Ben Ali, for 23 years. Although Tunisia was rated as a politically stable country having friendly relations with its neighbours in Europe and also with the USA, and a relatively better-off economy, however, its citizens were repressed. Ben Ali did not permit democratic means of expression by Tunisian citizens: He had jailed and tortured thousands of dissidents, he had controlled and restrained the media and had shut down civil society. Tunisian citizens had for years been losing their means of livelihood owing to the policies of Ben Ali, but they had no recourse to political change for betterment.

The situation came to a sharp focus when a street vendor, whose wheelbarrow full of produce had been confiscated and who had been beaten by the police, set fire to himself in a public square. This sparked a round of protests from ordinary citizens and the protests began to spread. The speed at which the protests spread across Tunisia surprised the dictator who immediately offered jobs for the unemployed, but the protests and riots did not stop. Ben Ali had to flee the country within a month.

Social network sites such as Facebook and Twitter had a role to play in the revolution in Tunisia. Young people with mobile phones and access to the Internet spread the stories about the protests (despite a clampdown in the official media of the country), took pictures and videos and uploaded them online, and sent messages about organising rallies. At some point, the government tried to shut down Internet traffic but to no avail.

Soon after the incidents in Tunisia, a Facebook page by a software engineer appeared about the repressive regime of Hosni Mubarak, the President of the neighbouring country of Egypt. The author, Wael Ghonim, was an employee of the Internet firm Google, and soon after he created the page, he was arrested and disappeared from public view. The happenings in Tunisia had already stirred revolutionary feelings in Egypt, and Ghonim's Facebook page added fuel to the people's latent anger. Egypt for long had suffered police brutality, lack of democracy and corruption, backed by high unemployment, low wages and high inflation. The incidents in Tunisia prompted revolutionary action by the youth in Egypt and massive rallies, protests, strikes and civil disobedience followed. Wael Ghonim was released from police detention and joined the protests. Although the protests were all over Egypt and were carried out by almost all sections of people, the Tahrir Square in Cairo saw the largest gatherings, with hundreds of thousands of people giving voice to the protest. Though most of the protests were non-violent, the government did resort to use of force and several hundred protesters were killed and thousands wounded. Less than a month after the protests began, Mubarak stepped down.

In Egypt too, social media had a strong role to play in both the build-up to the revolution as well as during the organisation of the protests. Blogs created by individuals, as also Facebook pages, recorded the uneasiness and repressed mood of the public. The Facebook page created by Wael Ghonim was called 'We are all

CASE STUDY: Social Media in Political Uprising

Khaled Saeed' referring to a Cairo man who had been beaten to death by the police. This page attracted a very wide following both inside Egypt and across the world, and also drew Western media attention to the imminent uprising. Since official media was controlled, Facebook and blog pages described the repressive nature of Mubarak's regime. (Like the deposed Tunisian dictator Ben Ali, Mubarak too was friendly towards the USA and Europe.) During the protests, Facebook, Twitter and SMS were used to organise rallies, create coordination mechanisms for continuous protests and also share news and information about the direct action. Many of the protests were video recorded and shown on YouTube.

Many argue that the protests in Egypt were spontaneous and provoked largely by the happenings in Tunisia, with online media having little to do with it. Like other developing countries, there is a large digital divide in Egypt too, with a large part of the population without access to the Internet and without the knowledge to use it. Furthermore, much of the resistance and protests were in small towns and cities across Egypt without a central organising effort required at the Tahrir Square. However, it is also true that the depiction of violence and brutality in website pictures and videos did influence the outcome of the revolution by informing people of what was going on.

In a different vein, another type of protest and rioting happened in the UK, in London, in August 2011. The incident originated in the accidental shooting of Mark Duggan, a resident of Tottenham in London, by the police. Residents of Tottenham immediately went to the police station to protest the shooting, and soon someone created a Facebook page with the details of the shooting. There was a near instant response to this on social media, and within a few hours several areas in London were in flames as rioters took to the streets. The rioting continued for two nights with the targets being stores, public vehicles and buildings, which were set on fire or looted.

Subsequent inquiry by the police showed that most of the organising for the riots was done through the BlackBerry Messenger Service, a peer-to-peer messaging service that is encrypted and remains visible to only the recipients. The BlackBerry is very popular with young Britons, who are also fond of the messaging service as it is free and allows groups to be created for one-to-many broadcasts. The messages were focused and precise, asking peers to converge on a particular street at a given time to start the riots. One such message read as follows:

> Everyone from all sides of London meet up at the heart of London (central) OXFORD CIRCUS!! Bare SHOPS are gonna get smashed up so come get some (free stuff?!!) [*&%@] the feds we will send them back with OUR riot! >:O Dead the ends and colour war for now so if you see a brother... SALUT! if you see a fed... SHOOT!

Another sent out shortly before a riot read as, 'Everyone in edmonton enfield wood green everywhere in north link up at enfield town station at 4 o'clock sharp!'

The focus of the riots in London was not a revolutionary political change; it was an upsurge of anger at the shooting death of an innocent man, in this case a man of non-European origin. Commentators argue that there is repressed anger and frustration in the UK, as was the case in Egypt, which played out in the violence that targeted the symbols of wealth such as brand-name stores and well-known buildings. The rioters did not have a common political agenda but were motivated by a sense of outrage at the social conditions they have to endure owing to the policies of the government.

15.1 SOCIAL DYNAMICS OF THE INTERNET

The Internet is a vast ocean of people, groups, organisations and even nations connected through electronic links. This constitutes perhaps the largest organising medium ever in history. It is also a social force that is bringing together hitherto diverse and unconnected groups of people and organisations. This social aspect of the Internet is different from its commercial aspects discussed under issues such as e-commerce. The social aspect has its own dynamics and an impact that has to be understood differently.

The technology that the Internet is built upon is that of the protocols (such as TCP and IP) discussed earlier. However, many applications have evolved, which address the needs of the society of the Internet – technologies such as tagging, rating, wikis and mashups. These technologies enable particular kinds of services and social organising. Such services include search, social networks, blogs and so on. Each service provides a unique set of features and ways by which people and groups can interact.

The society created by the Internet is different from ordinary society – it allows individuals to have multiple identities; it impacts the privacy of individuals and organisations and enables many to work in a transparent manner; and it impacts the media.

The following sections cover issues related to the society of the Internet, beginning with the services that are available on the Internet, the technologies that enable this and the issues that arise from people using the Internet.

15.2 SERVICES OF THE INTERNET

15.2.1 Search

Search is possibly the most important service on the Internet, as it allows people to look for and find what they are interested in, in the vast array of Internet resources. The search service allows people to find information of their interest in a reasonable amount of time and with the expense of a reasonable amount of effort.

The first search services, such as Yahoo!, provided directories of sites on the Internet, where users could look up sites and move to the relevant pages. However, this became insufficient as web pages had many links that led to other pages that would not necessarily correspond to the topic of the original page. It was then important to list pages according to their relevance to the user's search need. The first search services, such as AltaVista, provided such answers. In AltaVista, if a user searched for a phrase such as 'modern dance', the search service would list all pages, from different sites that it knew of, that had the phrase 'modern dance'.

AltaVista attempted to discover and list all possible pages that were available on the public Internet and classify them according to their content. The *search engines*, as they were called, relied on finding pages and then exploring all possible links that the pages contained, moving on to other sites and exploring their content, which was indexed using a classification scheme. This was termed as *crawling* and was performed by automated programs that continuously searched the Web for pages and classified them.

The problem that such search services suffered from was that they determined relevance based on the frequency of occurrence of words and phrases on the pages. For example, say a user is looking for information on 'modern dance' and is interested in understanding the differences between modern dance and classical dance forms. A page that describes these differences may not use the phrase 'modern dance' much, and may use other phrases to describe the dance forms. However, a page talking about a music band with the name 'modern dance' may have a higher number of occurrences of the phrase 'modern dance' although it is not the most relevant page from the user's perspective. But, the search engine would give prominence to the music band page in its search results.

The search engine Google, one of the largest search engines today, solved the above problem differently. The founders of Google realised that a good way to find out whether a page was important for a particular topic was to see how many people pointed to it. For example, if there are two pages, page A and page B, which both talk about 'modern dance', and if it is known that a larger number of other pages link to B rather than A for the topic of 'modern dance' then B has higher relevance than A for this particular topic. Google was created with this broad philosophy and it turned out to be widely successful. A key point about this strategy of Google is relying on other sites and pages for pointing out the most relevant page for a particular topic.

Google's Page Rank method relies on using two methods to rank a page: one is the number of other pages linking to it regarding a particular topic, and the other is the weight of the pages that link to it. If a page that is already heavily ranked, on say 'modern dance', as a lot of other pages link to it, and it in turn links to other pages, these other pages too achieve a high rank (see Fig. 15.1). Such a method allows Google to rank pages that people find valuable and link to them, and further uses this ranking to rank other pages. This ranking method requires constant monitoring

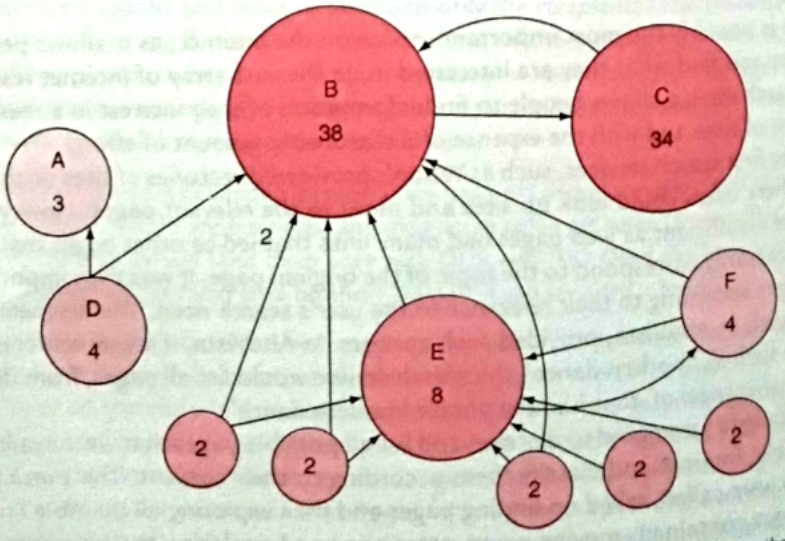


FIGURE 15.1 Google's Page Rank Method. Page B has the highest relative rank (38) as it has the highest number of pages pointing to it. Page C has only one page linking to it, which is Page B, but as Page B has a high rank, so Page C also has a high rank.

by the Google crawlers that frequently visit all the pages on their servers to explore whether others have created or deleted links to them.

Google lists billions of pages on its servers and is able to provide reliable searches almost instantly. As stated above, it also provides a ranking of the relevance of the pages for the search topic. Google maintains more than a million servers around the world that run web crawlers, which update the database of links. Google has found this strategy to be very successful and is one of the most powerful and popular Internet search engines.

Google also provides search services on special subjects like academic papers and news items, as also for special digital objects such as images, maps and videos. These services allow the search engine to focus on a particular domain and not bring in all possible items from the Web into the search results. Special searches like these are very popular and have opened a separate line of business for Google.

There are also many other search engines that provide different types of search capabilities and features, the most notable of these being Bing.com, Dogpile.com, Ask.com, Exalead.com and so on. Exalead.com provides a visual summary of the search results along with thumbnail sketches of the results. Ask.com allows users to type in their query in the form of a question. It interprets the question and provides possible answers. Dogpile.com is a meta search engine that searches the query in various other search engines and returns the results in a consolidated form.

Despite considerable advances in search technology, most users believe that the results from search engines are unsatisfactory. A Google search, for instance, does provide a host of pages and links to choose from, but in most cases the pages are not what users were seeking and they have to check many pages before they find their answers. Advances in search technology have addressed this problem. Summaries, visual maps, special knowledge about the search topic and other techniques are being used to narrow down the search results and provide more relevant and meaningful answers to users.

15.2.2 Blogs

Blogs are short for web logs or web pages maintained by individuals about their activities, interests or hobbies. Blogs are websites that enable individuals to easily and quickly write content in a web page and to add features such as images, videos and links to other sites. Each blog page has the name of the author and the pages are listed on a blog site such as Blogspot.com or Wordpress.com. Users create pages on these sites and then announce the address to their friends and acquaintances who can then read the content on the page. Pages are usually updated frequently and the readers return to their favourite pages to read the content provided. Readers can also leave comments on the write-ups.

Many famous personalities maintain blogs. The famous Bollywood film personality, Amitabh Bachchan maintains a blog that is actively read and followed (see http://bigb.bigadda.com). Posts on his blog sometimes become front page news articles. Some famous journalists too maintain blogs. These are actively followed by their readers, as sometimes articles that are editorially removed from the regular news publications may be placed by these journalists on their blogs.

Commentators say that blogs are rapidly becoming an alternative outlet for journalists and much of interesting breaking news about events first appears on blogs and later in news media.

Most blogs are created by ordinary citizens, many of whom are students, who write about their daily lives, their activities, their hobbies, their likes and dislikes, and publish them for their peers to read and comment upon. Blogs thus create a community that arises from the text and images on websites, where people with shared interests communicate and interact. Blogs are typically open to the world and can be accessed by anyone on the Web. They are also visible to search engines.

15.2.3 Social Networks

Social networks represent online web-based communities of people who share facilities similar to blogs. Social network facilities are provided by certain firms, such as Facebook and Orkut. These facilities enable people to create their own web spaces using which they can selectively interact with others. These networks differ from blogs in that they do not allow everybody to see pages and they permit users to define what is public and what remains private.

In social network sites, users can create web pages with images, video, sound, text and other materials. They can then join a network of others, with explicit links to other pages, and a method by which they define access – for example, 'friends' have most access to the user's page and facilities, whereas 'acquaintances' have lesser access. The software enables all persons on a particular network to see who has logged in, what messages have been posted, who has asked for specific information via a phone call or an e-mail, etc. It also allows users to play online games with each other. Online games are a particularly important feature of social networks and have drawn a large number of people to them, who play long and extensive games.

Social networks such as Linkedin.com are designed for professional use. People on LinkedIn use the network to seek professional contacts, information and services and also apply for job vacancies.

Social networks have evolved their own codes of conduct, where specific messages convey specific information that is coherent only to the users of the network. For example, a 'friend' request on a network is considered vital for many as it is an indication that the requester wants your attention. A delay in response or no response at all to such a request conveys different meanings. As most of the networks allow both synchronous and asynchronous communication, they provide a very rich environment for interaction and also for communicating both explicit and tacit messages.

Social networks have also been 'attacked' by spam messages and unwanted users. This has led to the decline of some networks, with users abandoning their sites owing to the large amount of irrelevant messages they have been subjected to. The social networking site Orkut has suffered such a fate.

Social networking sites are subject to very strong network effects. The more the number of users on the site, the higher the value for individuals as they can interact with a lot more people (see Fig. 15.2 that depicts the growth of Facebook users, showing strong network effects). Strong positive feedback, obtained from exchanging

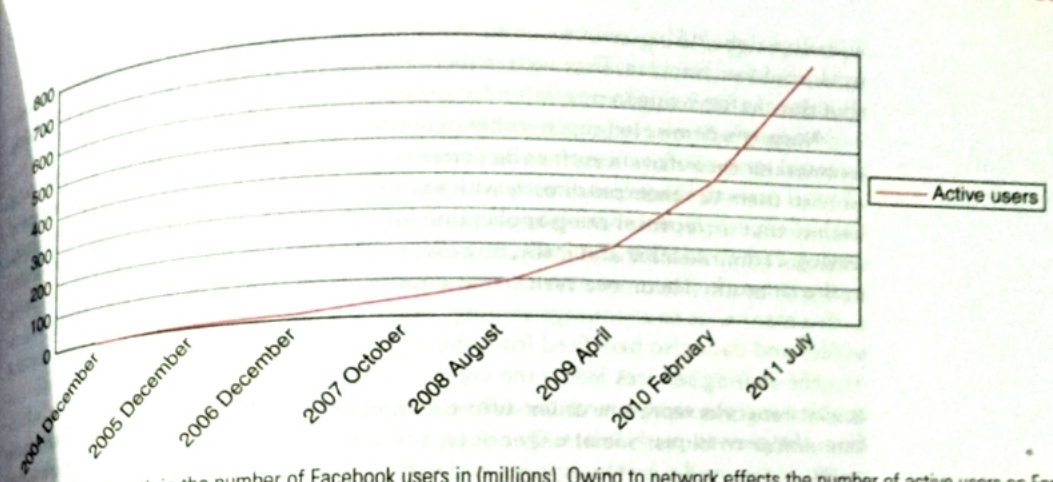


FIGURE 15.2 Growth in the number of Facebook users in (millions). Owing to network effects the number of active users on Facebook has almost doubled every year since its inception.

Source: Facebook statistics

messages and playing games, ensures that users stay with the network. However, negative feedback, in the form of spam messages, also acts to dissuade users from visiting the site and hence causes a mass decline in usage.

15.2.4 Peer-to-Peer Sharing

File sharing on the Internet precedes the arrival of the World Wide Web. Enthusiasts interested in sharing files used to upload their files on the sites that were accessible by the File Transfer Protocol (FTP). These FTP sites, as they were called, were then made known to others through bulletin boards and e-mail lists. Sometimes files were protected by passwords, and only selected members of lists who had access to the passwords could download the files, or they were made available through 'anonymous' users who did not need passwords. FTP sites were used extensively to share data, images and video files.

With the advent of the Web, the HTTP emerged as an easier method for sharing files, and people listed their data and multimedia files on websites that others can access and download. This is still popular as many users share their personal files with others through their blogs and social network pages.

Peer-to-peer file sharing evolved as a concept after the application initiated by a firm called Napster. Napster allowed users to store music files on giant servers, and these could be accessed and searched by others seeking music. Napster was unusual as a sharing site, as it was meant mainly for music files. The files used the MP3 format (this format allows music files to be compressed to a suitable size and also retain the original flavour of the music). Many users started converting their personal collection of files to this format to share them on Napster. Napster gained from positive network effects and became popular very quickly. Thousands of users started listing millions of songs on Napster's servers. Very soon the music industry realised that there

were copyright infringements due to the sharing of files, and followed with a lawsuit to close down Napster. They were effective in doing so, and Napster was effectively shut down after being in operation for only about 3 years.

Napster's demise led to a number of innovations in file sharing without the use of a central server. Software such as BitTorrents, Gnutella, Kazaa, eDonkey and Limewire allowed users to share files directly with each other without the use of a central server. Each client in a *Torrent* sharing application is both receiving files from a client and also serving data to another. Typically, any client could be connected to many other peers in the network. There was no central coordination. The software was designed in such a manner as to encourage sharing, where the user who shared the most number of files and data also benefited from the highest speeds.

File-sharing services led to the creation of many sites across the Internet, which enabled users to easily search for different categories of files and then download them from the peer-to-peer clients. One such site was called The Pirate Bay and included music, video, audio books, images and software files. Many of these files were being shared in violation of copyright laws of various countries. The Pirate Bay site was sued by the owners of film and music companies and the case was concluded in Sweden with a prison term and a fine for the owners of Pirate Bay. The court decided that enabling others to distribute copyright material is in violation of Swedish laws even though the site itself did not contain any copyright material.

Other file-sharing sites, such as Rapidshare.com and Megaupload.com, directly store and serve files. They allow users to store files to their servers and then ask others to download them. Rapidshare.com is very popular and stores millions of files that are downloaded and distributed by others. Sharing enthusiasts have also created websites that list files stored on Rapidshare.com, thus enabling users to easily search and identify the files they want. Sites such as Rapidshare.com are able to version their products easily, where users who have paid higher amounts are afforded better speeds for accessing files. In other such sites too, versioning based on speed of access enables the site owners to generate revenues directly from users. File-sharing software that work on a peer-to-peer basis do not have a model by which revenues can be directly extracted from users; instead, they rely on advertising on the pages that users see.

There is pressure from the music and film publishing industry to shut down such download sites, and Rapidshare.com has had to de-list many files that it had on its site that violated copyright laws. Recently, such sites have also had to submit to authorities the login information and IP address of users, as copyright owners have charged these sites with violations.

15.2.5 Virtual Worlds

Some of the most popular applications on the Internet have been online multi-user games that have drawn thousands of players from across the globe. In these games, players can join as individual elements of, say, a warring side, pick their own weapons and skills, and pitch their wits against the opposition that also consists of other players who have donned other roles. The roles are defined by particular images and shapes and sounds, and those of a given nation or type have similar characteristics.

Games such as Warcraft are extremely popular and have attracted a large number of players. The social aspect of such games reflects in the manner in which players, who may be completely unknown to each other, join in the game from different parts of the world and try to coordinate their activities and strategies to win. The games have built-in elements of luck and chance, such as the appearance of a dangerous animal or enemy element, that shape the player's responses and chances of survival.

In each game, it is common for users to assume an *avatar* or a persona that is either human-like or of an entirely different form. Such avatars have a finite life, and require food and company of others to survive, in a weak imitation of real life. The avatars are also imbued with some skills that they could deploy to survive in the game and win points.

In a social networking site initiated in 2003, called *Second Life* (see http://secondlife.com/), the creators took the essential ideas of multi-user games and avatars and created a world in which users could log in with their own avatars and participate in social interaction. There was no gaming element to Second Life (SL), but the avatars could engage in conversations, own property, exchange objects and money, interact in private or public and generally maintain a life in a digital space. SL's objective was to provide a virtual space in which avatars could interact as if in the real world and insisted that it was not merely to play games.

Second Life allowed people to own digital property on the site. It floated a currency of its own, called Linden dollars, which could be bought with real money. With Linden dollars, users could buy property in the different neighbourhoods and locations in SL, build homes or offices and start living there. Many started businesses that transacted entirely on SL, for example, they sold digital objects that could be used to construct other objects. Others started businesses that could assist with the real-world businesses, such as marketing of products and services. Large firms such as IBM and Dell set up stores and offices on SL. Many firms started holding private meetings and also job interviews on SL. Some universities started offering courses on SL.

SL has gained immense popularity. In 2007 it had 7 million registered users and transacted business worth USD 500 million. Although SL is hosted by a US firm, its primary user base is not USA, and a majority are from other countries. The size of the physical land that SL simulates is similar to that of the nation of Singapore.

In a landmark event, Sweden opened an embassy in SL in 2007. This consulate has its own building where avatars can visit. The building has paintings of famous Swedes and also has a gallery where art is on display. The embassy does not issue passports or visas and is meant to provide information about Sweden to interested visitors.

Much of SL's success derives from the fact that the virtual social space presents a context in which interactions happen. It is true that people can interact on the Web by many channels – chatting, video streaming, e-mail and exchange of files. SL creates an environment in which specific objects have meaning. For example, objects like room, chair, window, etc. can be used to create a context. If a firm wants to demonstrate a product to potential customers, it can create images and videos of it and send them to the customer to view, or it can create a simulation of the object (provided it can be simulated) on SL and demonstrate it with their SL avatars to its clients.

SL too is subject to strong network effects and has gained popularity as more people have joined SL. However, since about 2010, SL has also experienced some negative feedback which has led to a decline in the number of active users.

15.3 TECHNOLOGY OF THE INTERNET

This section discusses some of the technologies that are used to create the society of the Internet. Some elements of these technologies have been discussed in earlier chapters.

15.3.1 Web Pages

Web pages on the Internet are created by using the HTML that enables pages to be rendered or viewed by the browser. Pages for the Web are written in plain text with markup commands that the browser reads to display the text. For example, the following command:

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<html>Hello</html>
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tells the browser, such as Mozilla Firefox, that the word 'Hello' within the markup commands has to be rendered as text on a web page. Other commands include formatting commands, such as bold (...), italics (...), commands to link to other pages, commands to format the page, to position text or images and so on.

Web pages also allow embedding of scripts and code written in Java or other programming languages that allow complex computations. These scripts can also connect the web page to a server that provides data for computation or saves data entered on forms on the page. The HTML language provides the front end for displaying the page, whereas other languages can be used for quite complex applications.

15.3.2 Wiki

A wiki is also a web page, with a difference. A wiki page can be created and then modified by many authors. The idea of the wiki is to allow collaborative authoring of text on the web page. The wiki technology is similar to a Content Management System, where many people can write or upload content. The difference is that the wiki allows anybody to change the content at any time, and it maintains all past versions so that if an older version is required, it can easily be recovered.

One of the most famous examples of the use of a wiki to create content is the Wikipedia, an online encyclopaedia. Its originator, Jimmy Wales, initially wanted to create an online encyclopaedia that would have high-quality articles that could be freely accessible to anybody (in opposition to publications such as the Encyclopaedia Brittannica, which have articles of very high quality but were very expensive and few could afford them). He started out by contracting a few authors, those who were experts in their fields, and asked them to write articles for the encyclopaedia. This was not very successful as he was able to obtain only a few articles over many months. He was then struck by the idea of creating a site where anybody could write an encyclopaedia article, and with anyone else being able to critique and modify it.

Wales envisioned that with a crowd of people getting together to create and edit articles, the quality was bound to be good, possibly very high.

Wales created a set of rules by which to write and modify articles and then opened up the Wikipedia site to the world. The response was tremendous as within a few months, thousands of articles appeared on the site with hunderds of authors and editors. The rules for creating the articles were:

1. No original research articles.
2. All citations had to be provided.
3. On matters of debate there would be a specified time period for discussion.
4. Conventions of writing/rewriting of articles would be followed.

Wikipedia articles gained popularity among readers in all parts of the world, and wiki articles in many other languages started appearing on the website. By February 2011, there were over 17 million articles on Wikipedia in 30 different languages. Other details about Wikipedia are given in Table 15.1.

The wiki technology allows network effects to take place. Those contributing to articles attract both readers and writers. The topics are not restricted, and this attracts a large number of people too as unlike traditional encyclopaedias, wikis touched casual topics of mass interest, such as popular films, film stars, popular music and culture. Contributors wrote articles on all types of subjects that took their fancy and that were likely to have interest among readers. The articles were permitted to be listed on Wikipedia as long as they met the editorial criteria.

Wikipedia is quite popular in India where it received over 13 million unique visitors a month in 2010. Wikipedia articles exist in many Indian languages but more than 98% of the traffic is directed at English articles. Table 15.2 shows the number of Wikipedia articles in major Indian languages.

Table 15.1 Details about Wikipedia, as of February 2011

Number of people who read Wikipedia each month	408 million
Number of Wikipedia language versions	250
Number of active community members	100,000
Number of articles in all languages	17 million

Source: Wikipedia.

Table 15.2 Number of Wikipedia Articles in Major Indian Languages by February 2010

Language	Number of Articles on Wikipedia
Hindi	60,000
Telugu	46,000
Marathi	32,000
Tamil	25,000
Bengali	21,000
Gujarati	17,000

Source: Wikipedia.

The wiki technology is used by other sites too, to enable collaborative writing and document creation. Sites such as Wikispaces.com allow organisations to create private wikis, those open to the members of the organisation but not to the world, and use them to collaborate on projects, create documents and communicate with others. The wiki technology is built on open source components and can be accessed and used by anyone. Many organisations have set up internal wikis for collaboration and knowledge sharing.

15.3.3 Twitter

Twitter is one of the fastest growing social networking sites. It is a combination of a blog and a short messaging service (SMS) on a mobile phone. A user can post messages, called tweets, on the Twitter service, and the messages are then broadcast to all those who have enrolled with the user. Messages are necessarily short, less than 140 characters, the limit for SMS messages. Once a twitter message is posted, it is listed on the user's Twitter page as a blog, and also sent out as a tweet.

The Twitter service was envisaged as a short but frequent blog service. Users send tweets about their everyday routine activities, about happening news, about sports scores or simply idle chatter. Since tweets can be received on mobile phones, the message receivers are not restricted to access through computers or websites. Short messages can increase in density and number and have a tendency to be very addictive for users looking for news on a topic of their choice.

Famous personalities too have started using twitter to update their fans or followers about their activities. The US presidential candidate Barack Obama used it effectively to keep in continuous touch with his supporters during his campaign in 2008. Many film personalities, elected officials and journalists too keep their fans updated through frequent tweets about their activities.

The Twitter technology is also subject to strong positive feedback and network effects. As messages are short and frequent, there is a tendency to continuously read and forward them. Furthermore, the Twitter website allows searching for terms and also aggregates the most frequently tweeted terms. These cause a feedback loop as users further seek and read about these items, and forward them through tweets.

15.3.4 Rating

With the very large number of sites on the Internet and the massive scale of information, quite often users turn to rating services and agencies to provide them with reliable ranking of the information provided on various sites. The search services do this by providing their own rankings, such as the one provided by Google. Other services, such as Digg.com rely on explicit user ratings of articles. Digg allows users to rate all articles listed on its site, and the ones with the highest ratings are showed prominently. This rating is done by the user community and not by the employees of Digg.com and thus is governed by the popularity of articles.

Sites such as Alexa.com rate websites by the number of users visiting them. Other websites rate celebrities, films, books, consumer products, software and hardware, jobs, companies, news magazines and so on. The technology may be as simple as

choosing between two pictures and checking off which is better, or asking users to rate a product on the basis of a 5-point scale, with 1 point as the worst and 5 points as the best. The technology allows the aggregate rating to be updated immediately thus showing the user how his/her rating matches with others who have rated.

Websites such as Stumbleupon.com allow users to rate the sites they have listed, categorise them, and then provide the highest rated ones as surprise entries to those who visit the site. Stumbleupon relies on ratings provided by prior users to decide on what to offer to subsequent visitors. Stumbleupon has a very successful website based entirely upon preferences of users.

Successful e-commerce sites such as eBay and Amazon.com also rely on ratings. eBay uses the ratings of its buyer and seller users, provided by other users, to inform potential buyers and sellers of the reliability of people they are about to transact with. eBay's rating system is very successful as people are honest about their ratings and also rely on the ratings provided by others. Amazon.com allows users to rate books and other items it sells on the website itself. Users can also leave detailed comments about why they liked or disliked the item, thus justifying the rating they provided. Amazon.com further allows readers to rate the comments on products and say whether they found them useful, thus allowing the most useful comments to be displayed prominently.

Enabling the rating technology on websites explicitly enables feedback that is necessary for network externalities to function. Such facilities are able to ensure shortening of the feedback loop and hastening of the externality effects.

15.3.5 Tagging/Folksonomies

Some websites allow users to not only rate the quality of the content but also classify their contents. For example, a site on 'modern dance' may actually have a bulk of its content dedicated to fusion dance, with a blend of Indian classical and western dance. Some users, knowledgeable about such matters, could classify or tag the content appropriately. Such tagging can then be displayed for other users to check and use.

The site flickr.com, which facilitates sharing of photographs, uses tags to classify photos. The tags are provided by the users to broadly classify the images they upload to the site. The collection of tags on a site is sometimes called a 'tag cloud' where all the subjects are displayed for other users to access. Tag clouds are also graded, with the most visited tags getting the largest font size and the less visited ones getting smaller font sizes. The website Flipkart.com, which sells books online, uses tags to display the most popular books and subjects being sold on the site.

Creating taxonomies of sites and pages and content by the users of the sites are referred to as *folksonomies* that refer to the 'folk' nature of creating the taxonomies. These folksonomies show network effects, as the feedback provided by users serves to reinforce the category of the content. It is evident that the search engine Google.com also uses tagging created by users to classify and rate the content of websites.

15.3.6 Mashups

Some websites are created by joining up two technologies available on other sites. For example, some sites take map data from a particular site and join this with the wiki

technology to enable maps that can be written upon and changed by users. One example of such a site is wikimapia.org, a site where users can update and change the maps available or add their own data. The sites that join two technologies are called 'mashups'.

Mashups rely on using the underlying interfaces of different technologies and joining them in such a manner as to make them amenable to manipulation. They provide a means by which sites and services can build upon existing facilities.

15.4 SOCIAL ISSUES

15.4.1 Identity

The society of the Internet poses peculiar situations for individuals to maintain their identity. Every online service asks the user to create an 'account' or an identity that can be used by him/her. This account often has to be verified or supported by an e-mail address of the user or, if it is a commercial site, by a real credit card. However, in most sites, the identity that a person uses does not have to be connected to the real person. So a person on Twitter, for example, can assume a different name, a different gender, a different age group and a different language. The person can present himself/herself in a manner that is in no way similar to his/her real identity. What is more, the person can maintain multiple identities on the same site or on different sites.

Such a facility allows a person to assume different roles and, possibly, play games or use some form of entertainment. However, for organisations, this is of interest as individuals can use various identities to resist changes, present unpopular views, challenge others, or even expose secrets or hidden issues. Such activities have always been present, in the form of anonymous messages and e-mails, leaking of information to rival organisations, etc. However, in the Internet era, they have assumed a different significance and form. Organisations now have to set up procedures to identify or at least have an idea of the persons, real or virtual, they are dealing with.

15.4.2 Privacy

Most social networking sites such as Facebook allow users to create their own settings for privacy of their data, which means that users can specify what aspects of their personal details are visible to others. When users do not set many controls, it leads to a situation where all their documents, settings and activities are visible to others, and also the site is able to use the data for its own analysis. Even when users set tight privacy controls, some of the preferences they set and some of their activities are used as data by the system.

In some countries, individual data privacy is protected by laws. The data created by individuals on electronic networks is their property and cannot be shared, copied or distributed by others including those maintaining the networks. However, there are grey zones within these privacy protections. For example, Facebook users found that the books and movies they borrowed from a private service were being broadcast to their network of friends without their knowledge. This was contentious; although they had given permission to share data with their friends, they had specifically not permitted this transaction data to be shared. Facebook had to remove this feature upon demand from its users.

Many famous personalities, such as film stars, sports stars, authors, political leaders and journalists, have started revealing detailed aspects of their private lives on blogs and other social network sites. Film stars in India often reveal their whereabouts in Tweets they send out to their fans, as also the clothes they are wearing, the people they are with and other details. Some are careful about what they reveal, whereas others uncover details of an intimate, and possibly, insecure nature.

15.4.3 Media Impact

Social media is having a strong impact on traditional media. Prior to the Internet era, the principal mode of communication for media was through broadcast means such as radio, television and newsprint. Individuals were recipients of news and opinions, and could occasionally inform such channels through letters, public interviews or talk shows. With the presence of social media, the tables have turned considerably. A large number of media channels, including print and television, are both influenced by and are influencing the social media.

Many social and political events, such as those depicted in the lead case, are now often first reported or listed on social media by ordinary citizens, which then creates the awareness that drives traditional media to them. Political commentators in India are now prone to publish a report on a blog or a Facebook page to draw public attention before writing or presenting the same in traditional media. Often, the only sources of information from some troubled areas, as was the case in Egypt and also during the tsunami strike in Japan in March 2011, are the posts, videos and images available on social media. Individuals with mobile phones or netbook computers are able to write and upload images using their own devices, which become the prime source of information.

Traditional media also becomes a source of activity on social media. When events such as military strikes against a nation or the suspension of civil rights in a country are reported by traditional media, they become the focus of attention of social media, who may oppose or support and spread the views. Many traditional media also maintain their presence on sites such as Facebook, Myspace and Twitter and encourage such responses.

15.4.4 Collaboration

The Internet represents the largest collaboration platform in history. The collaboration is enabled not only for social and political action but also for creating software, encyclopaedic content, books and films. Wikipedia, discussed earlier, is a massive collaboration platform for over 100,000 individuals dispersed all over the globe to participate in creating content. The open source movement, discussed in the next chapter, has created billions of software modules and packages that are used by people all over the world. An open source package, like the operating system Linux, has thousands of developers around the globe who collaborate through the Internet.

The phrase *crowdsourcing* is often used to describe projects that encourage collaboration. The term refers to the idea that a 'crowd' of people, not necessarily known to each other, participate in working on a project.

Many critics have argued that crowdsourcing works for some kinds of tasks, but for others it is not effective. For instance, it was initially argued that the quality of articles on Wikipedia was not as good as that available in a traditional encyclopaedia like Encyclopaedia Britannica. However, this turned out to be only partially true. In a comparison conducted by the *Nature* magazine, a well-respected science journal from UK, some experts were asked to rate 42 articles on scientific topics from both Wikipedia and Encyclopaedia Britannica. The results were that the experts found 162 errors in Wikipedia, whereas Britannica had 123 errors. Although Wikipedia did have a higher number of errors, it was striking that Britannica had such a high number too. This finding starkly put to rest the notion that some traditional media were far superior than new media.

A very unusual crowdsourcing effort is known as the Galaxy Zoo (available at www.galaxyzoo.org). The problem that Galaxy Zoo places before visitors is that of classifying images of galaxies, which are star constellations in the universe, obtained from the Hubble Space Telescope (see Fig. 15.3). The site is created by a consortium of universities that do research on studying the universe. One of the first tasks that the site put out was that of classifying the galaxy images into two groups – spiral and elliptical galaxies. Although the classification of images can be done by software such as Neural Networks, the researchers knew that humans were much better at this task. The project was initiated in 2007 with a million images of galaxies to be classified, and the organisers assumed it would take about 2 years to complete the task. However, the site started receiving 70,000 classifications an hour, and in 1 year received more than 50 million classifications (many galaxies were classified multiple times). The classified galaxies were then considered for further research. The participants in this crowdsourcing exercise were often school children and ordinary citizens, not necessarily scientists.

After the success of the first round, the site set up another project by taking images from the first classification effort, and asking more detailed questions about the images. Within 14 months, the site had received over 60 million classifications. Some volunteers of the site were also able to point to the objects in the images that were outside the scope of the task, which drove the researchers to examine these new objects and ask new questions – thus opening up new areas of research.

FIGURE 15.3 Image of a galaxy classified on Galaxy Zoo. The grey object in the bottom is an unclassified element that prompted further research.

Source: www.galaxyzoo.org (reproduced under Creative Commons License).

15.4.5 Emergence of Order

The openness of the Internet collapses the traditional presence of hierarchy in societies. It is possible for an ordinary citizen of India to send an e-mail to the Prime Minister or to visit the blog page of the President of another country and leave a message. Before the electronic era, this would have required the citizen to move through a protocol of controls and permissions to be even near a Prime Minister let alone talk to one; but, for the most part citizens simply did not have access to those at the top.

Collaboration over the Internet has a flavour of democratic access where everybody can contribute equally and no one is barred. This leads, as many argue, to a chaotic situation where anybody can say anything and there is no focus or clarity. However, the evidence from sites such as Wikipedia and open source projects shows that there is an order that emerges from the chaos to create high-quality products.

When Wikipedia was opened up for contributions from the world at large, the premise was that people would collaborate to write articles. However, right from the start it became clear that there would be differences of opinion as to the content of articles, and as the wiki technology allows any number of revisions, the articles could possibly be changed endlessly. Wikipedia has discussion pages that support all articles, and maintain a record of all the discussions around the text that is written and edited, including a record of all the versions. These discussion pages allow contributors, who may participate in the writing of an article at different points of time, to see the history and reasoning behind the article and then build upon it. Discussions would range about the content of different contributors, their intentions, the overall goal of the article and how the article should be further edited. An example of a comment on a discussion page is as follows:

> This editor's contributions are always well provided with citations, but examination of these sources often reveals either a blatant misrepresentation of those sources or a selective interpretation, going beyond any reasonable interpretation of the authors' intent.

Articles were written and rewritten, and edited many times. Some articles continued to evolve over many months. Wikipedia had liberal editing and control norms to begin with, but to stem some of the difficult debates and contentions, it evolved a hierarchy of editors who would be in a position to resolve the differences. As Wikipedia began to grow, these editors, who were also volunteers, assumed greater powers and got entrenched in a hierarchy, largely of their own making. By 2006, when Wikipedia had over 3 million articles, some commentators called the strict hierarchy of editors 'digital maosim' referring to the almost dictatorial powers that some editors wielded. Wikipedia responded to this criticism by revising its policies to ensure more debate and discussion, but the structures of editorial staff remained. These structures represented an order that had emerged from the democratic anarchy.

15.5 SOCIAL NETWORKS IN THE ENTERPRISE

The services and technologies that constitute the society of the Internet are used extensively by enterprises. Social networking sites like Facebook and LinkedIn are

being used extensively by organisations for both marketing their products and also for recruiting personnel. Given the success of many technologies in the social space, enterprises have now incorporated them within their organisation. The idea is to use a wiki or a social networking platform, but within the organisation. These are often called *Enterprise 2.0* tools.

The use of social network tools within organisations poses many challenges and opportunities. One challenge is that these tools may not lead to productivity increase, as they may make employees fritter away their time on making posts and reading them. Studies show that organisations may lose much even if employees spend 20 min a day on social media sites. However, the opportunities that these sites provide are tremendous: the ability to create and sustain ad hoc groups to solve particular problems or work together on projects; the facility of searching quickly or asking someone about information and knowledge related to particular tasks (in other words, helping in knowledge management); and helping employees to know one another, particularly in large organisations with many divisions and departments.

Recognising and finding experts within the organisation is one of the primary benefits of social networking within organisations. Many organisation theorists argue that the most productive employees are so because they not only know their jobs very well and work hard, but also because they know who to ask for what information. The best employees maintain an informal network of contacts through which they can get their work done. Social networking technologies assist in helping employees find the best skilled people and retain links with them, thus helping them do their jobs better.

Managers have also found that by using Enterprise 2.0 tools they can know who is connected with whom, who all share skills and interests, and who can work with whom. This knowledge helps them put together teams for future projects.

Chapter Glossary

Search The ability to seek and find relevant information on the Internet in reasonable time.

Blogs A web page or a log used by individuals to record their thoughts and opinions on the Internet for everyone to view.

Social networks Internet facilities that enable communities of people to create web pages through which they selectively interact with others.

Peer-to-peer sharing File sharing between individuals on the Internet without the facilities of a central server or website.

Avatar Online persona of an individual, assuming a human-like or other form.

Wiki A web page that can be authored and edited by many persons.

Tagging Classification of web pages by individuals or by communities.

Folksonomies Classification of pages and content by communities.

Mashups A combination of two or more Internet technologies.

Crowdsourcing Enabling many people to contribute to pages, products, artistic creations and other artefacts on the Internet.

Enterprise 2.0 Firms and organisations that have adopted social networking technologies within their organisation.

Review Questions

How is the Google search engine technology different from others?
What is a blog?
How are blogs different from social networking sites?
Are social networking sites, like Facebook, subject to network effects? How?
What are two different ways of sharing files through the Internet?
How are virtual worlds different from regular websites?
What is the Wiki technology? Is it subject to network effects?
8. What is the Twitter technology? How is it different from SMS?
9. How are ratings used by e-commerce sites?
10. What is tagging?
11. What are folksonomies?
12. What are the issues of identity on the Internet?
13. Why is privacy a concern for organisations?
14. How does crowdsourcing work? How is quality controlled when crowdsourcing is used?
15. How does the site Galaxy Zoo manage crowdsourcing?

Research Questions

1. What are some examples of use of social networking technologies for political campaigns in India?
2. How is crowdsourcing used for creating maps? Give some examples.
3. Do a search on a particular term, such as 'modern dance' on Google and then conduct a similar search on another search engine (Bing.com or others). Consider only the first 10 results from each search and examine them carefully to see which search engine gives better results.
4. Consier a scientific topic, such as 'alluvial soil', and read up about it on Wikipedia. Then look up the same topic in a relevant science book or another encyclopaedia. Carefully compare the two articles. Which source is more comprehensive and accurate?

Further Reading

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