Users In The 'Golden' Age Of The Information Society

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Abstract

In the Web 2.0 era it no longer holds to think of users as 'end-users', as they have moved to the heart of the value chain. They have become important actors in virtually all elements of online services. In this paper we shall explore these innovative roles of users and reflect on the future impacts of this shift. To support our claims about the innovative roles of users, we have analyzed 150 Web 2.0 services into more detail. In this paper we shall argue that Web 2.0 may be understood as a first sign of what Perez has labelled 'societal re-engineering' and 'creative destruction'. However, as we are still at the beginning of what Perez describes as a potential golden age of the information society, there are also still major uncertainties about the future of the web and the potential impacts this may have. At this point in time it is far from sure whether we are indeed approaching a 'golden age' of technological development. To explore the *future* roles of users, in the final part of the paper we shall therefore also highlight some future aspects from the perspective of changing user-producer relations.

1. Introduction

In 2004, O'Reilly Media popularized the phrase 'Web 2.0' for describing a new and potentially disruptive stage in the development of the Internet. The Web 2.0 concept has since become hugely popular - if not hyped - and has thus created as much confusion as consensus about what Web 2.0 really means. There has never been a coherent definition of the term; it has been more of a conceptual set of principles and practices (Madden and Fox, 2006). The concept originated from the observation that the Internet was far from dead after the burst of the dot.com bubble at the turn of the 21st century. Although the Internet crisis caused a substantial shakeout of Internet firms, it also marked a turning point for the web: since then we have seen a whole range of successful new applications coming up. Most remarkable and perhaps incomparable is the *exponential growth* of this new generation of applications, both in terms of number of applications and number of users. According to Gantz et al. (2007), in 2006 the amount of content created, captured and replicated on the Internet was about 3 million times larger than the information in all the books ever written. Their prognosis is that this will keep on growing the coming years. And by 2010, 70 percent of the content on the Internet will be created by individuals (Gantz et al., 2007: 2).

According to O'Reilly, behind the success of many Web 2.0 applications are smart ways of using the web as a platform for data management, particularly by exploiting the connectivity and collective intelligence of the

users. Web 2.0 services exploit connections between users, as these connections provide manifold opportunities to create added value. Not only are users actively consuming content, users also take on distribution roles in peer-to-peer (P2P) file sharing, and content creation roles in the case of user-generated content. Users actively rate and tag content (a phenomenon known as folksonomy), download content, comment on it, and communicate about it with their peers. Users furthermore share agendas, locations, bookmarks, documents, photos, videos and even friends, all online and on a large scale (Slot, 2007a). These user roles, combined with the scope and speed of the Internet, provide many opportunities for businesses to design new and innovative services. O'Reilly concludes about Web 2.0 services: "Network effects from user contributions are the key to market dominance in the Web 2.0 era"[1].

Thus, it is fair to state that one of the crucial features of this second stage of the web is the empowerment of the user. In the Web 2.0 era it no longer holds to conceive of users as 'endusers', as they have moved into the heart of the value chain. They have become important actors in virtually all elements of online services. In this paper we shall explore these innovative roles of users and reflect on the future impacts of this shift. This exercise will enhance the understanding of the concept of Web 2.0 and subsequently the roles users take on in this development.

1.1 Outline

First we shall describe in more detail how new user roles are represented in Web 2.0 developments. To support our claims about the innovative roles of users, we have analyzed 150 Web 2.0 services in more detail. We shall argue that Web 2.0 developments mark the beginning of what Carlota Perez has labelled the 'deployment period' of a technological innovation. This period is not only characterized by high deployment of a technology, but also by what Perez calls 'societal re-engineering' and 'creative destruction'. Technological revolutions involve complex processes of social assimilation, which encompass radical changes in traditional patterns of production, consumption, organization, management, communication, etcetera, leading ultimately to a different 'way of life' and possibly a 'golden age' (Perez, 2002: 153). We will explain what these concepts mean and they will be used as guiding principles in our analysis.

In this paper we shall argue that Web 2.0 may be understood as a first sign of societal re-engineering (represented by the shift towards user empowerment) and of creative destruction (represented by new business models underlying Web 2.0 services). However, as we are still at the beginning of what Perez sees as the second (and 'golden') period of technological development – the deployment period – there are also still major uncertainties about the future of the web and the potential impacts this may have. At this point in time it is far from sure whether we are indeed approaching a 'golden age' of technological development.

[1] http://www.oreillynet.com/pub/a/oreilly/tim/news/2005/09/30/what-is-web-20.html?page=2

To explore the *future* roles of users, in the final part of the paper we shall therefore also highlight some future aspects from the perspective of changing user-producer relations.

1.2 Methodology

In March 2007, 150 Web 2.0 services were analyzed. These services were selected from the Seth Godin *Web 2.0 Traffic Watch List*.[2] To construct this list, Godin employs the Alexa service. This online service measures Internet traffic by storing traffic data provided by users who have installed the Alexa toolbar. Godin uses this data to construct a Web 2.0 traffic watchlist, compiled of 952 services. These services are selected and ranked according to generated traffic. The list starts with well-known websites like YouTube, MySpace, Orkut and Wikipedia, but also lists less famous services with interesting names like Drupal, Esnips, Meetup, Reddit, Feedblitz and Imeem.

The first 150 services on the list were selected for analysis. Upon closer examination, eleven services were not taken into account. Either they did not exist anymore, or they were not directed at private users but at businesses. The final case sample consisted of 139 Web 2.0 services. In the case sample, multiple variables were analyzed. These variables described mainly possible user roles in the services and the way these services generated an income. Although this research will be carried on in more depth in the future, in this paper we will present the first outcomes of the analysis.

2. User roles and socio-technical change

The now widely-used term Web 2.0 implies that users take on many active roles in the value creation process. They supposedly have become the key drivers of technological change. Many have embraced the idea of Web 2.0 – others have labelled the term a hype. If we use Carlota Perez' comparative analysis of technological transformations, we may consider the fast rise of Web 2.0 as the beginning of 'period 2.0' – or the deployment period of the Internet.

This point of view may be taken if we follow Perez' influential analysis in *'Technological Revolutions and Financial Capital. The Dynamics of Bubbles and Golden Ages'* (2002). In this book she argues that it takes several decades before the full fruits of a great technological revolution can be reaped. According to Perez each technological upsurge of the last centuries shows a similar pattern of subsequent stages of growth. First, there is a period of explosive growth, great turbulence and even frenzy, followed by a short period of crisis. In this first stage there is a mismatch between the belief in the promises of the new technology on the one hand (expressed in high investments of venture capital) and the socio-economic environment on

[2] http://www.statsaholic.com/sethgodin

the other hand, which is still dominated by 'old' institutions. The first 'installation period' therefore often ends in a crisis, or burst of the 'bubble', as we have seen with the dot.com crisis at the beginning of the twenty-first century. After this crisis follows a period of more harmonious and sustainable growth, characterised by high deployment and a better fit between the 'new' technology and the socio-economic context in which it is deployed and embedded. High deployment creates the conditions for 'a real golden age of a technological revolution'.

Perez' analysis is particularly useful for an analysis of the development of the Internet: in her terms we are now at the threshold of the second stage of this particular technological revolution. Characteristic for this stage is not only the high degree of deployment of technology, but also what she calls 'creative institutional destruction' and 'societal re-engineering', which are the necessary conditions for this more stable and harmonious stage of technological development. We have used Perez' thinking here in a rather broad sense for our assessment of Web 2.0 developments. In the following account of our analysis of 150 web services, we will focus on (1) the deployment of Web 2.0 services, (2) 'Societal re-engineering' and (3) 'Creative destruction'.

The concept of deployment is used to describe to what extent and in what way Web 2.0 services are deployed (or used). Firstly, to assess the level of deployment of Web 2.0 services, we need to have indications about the extent of use of these services. A first indication can be found more generally in other research about the uptake and impact of Internet technology. Specifically for our case sample we have taken into account figures about the use of these services. Even though it is difficult to obtain reliable figures which indicate use (often these are measured in many different ways) we will attempt to shed some light on that issue. Another indication can be found in the data from Alexa providing Internet traffic figures. Secondly we need to assess the nature of these Web 2.0 services. Based on an analysis of our case sample we made a classification of Web 2.0 services.

Societal re-engineering is represented in our analysis by new or innovative user roles. These roles reflect the potential of the technology to adapt to and be embedded in real societal needs. This study focuses on users at home who are active on the Internet in their leisure time. User roles do not need to be completely 'new' in the sense that they have never been taken up by users before. Users for example still are *consuming* content online in more or less conventional ways. Following Tuomi, innovation can also be understood as a process where user communities "develop new uses for existing technological artifacts, at the same time changing both characteristics of these technologies and their own practices" (Tuomi 2002, p.23). Compared to the roles users had in relation to more traditional media like newspapers and television - mainly as consumers and interpreters of content - the roles that users have taken up when using internet, have certainly changed significantly. As has been clarified in our introduction, users have become co-

producers of virtually all elements of the service delivered, creating value in many stages of the value creation process. They are taking up roles that previously had been taken up primarily by business parties. And even the traditional roles, like consuming content, are now much more diverse in nature.
To explore these new roles more closely, for this study we have defined five categories of user roles based on observational data; consuming, creating, sharing, facilitating and communicating. These categories are subdivided into more diversified roles, see Table 1.

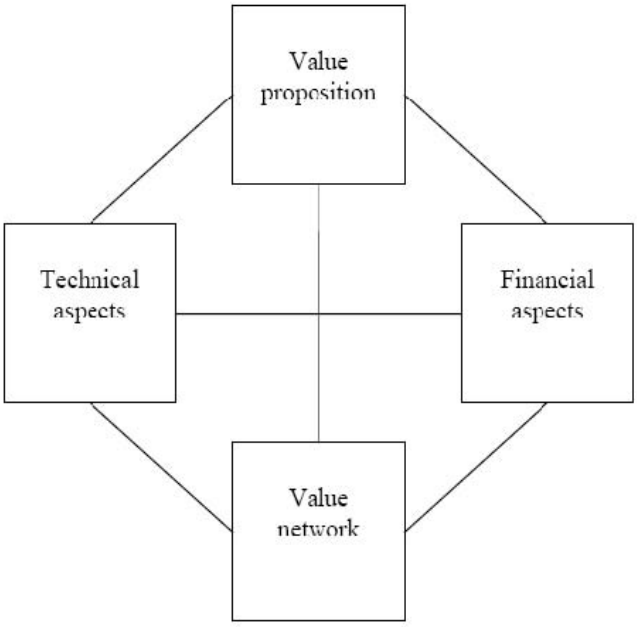
Table 1: Role classification

General role category	**Sub-role**
Consume	Read
	View
	Listen
	Download
	Buy
	Play (game
	Search
Create	Customize/ personalize
	Create/ produce content
	Contribute
Share	Publish
	Upload
	Send to others
Facilitate	Tag
	Recommend
	Filter
	Subscribe (RSS)
	Channel
Communicate	Send message to other user
	Comment
	Rate
	Chat

Creative destruction is represented in our analysis by new business models underlying these services. When traditional ways of doing business are being replaced by new and innovative ones, it can be argued that significant changes are taking place. With the concept of 'businesses' (or producers) we want to indicate

the parties that are most directly connected to the users as the producers/facilitators of the services. In our analysis, the concept of a business model does not only comprise the revenue model of a service, but also the way the service is technologically defined (is it open or closed), the way businesses are taking up their position within the field (are they cooperating with others for example) and the value they offer to their users (e.g. Timmer, 1998; Osterwalder, 2004). These four business model domains will be used as informal guiding principles in our analysis. For a graphical representation; see Figure 1. We will use these general business model levels as exploratory, heuristic concepts.

Figure 1 General business model levels



3. The deployment of Web 2.0 services

To what extent are Web 2.0 services used? As has been described in the introduction, Gantz et al. stated in a white paper that already in 2006, more information was available on the Internet than in all the books in the world. This indicates that the Internet has become a huge database of information. However, it doesn't give any hints about to what extent this technology and this information is actually used. Many research institutions, for example the Social and Cultural Planning Agency (SCP) in the Netherlands and Pew Internet and American Life Project in the United States are researching the uptake and use of the Internet. All

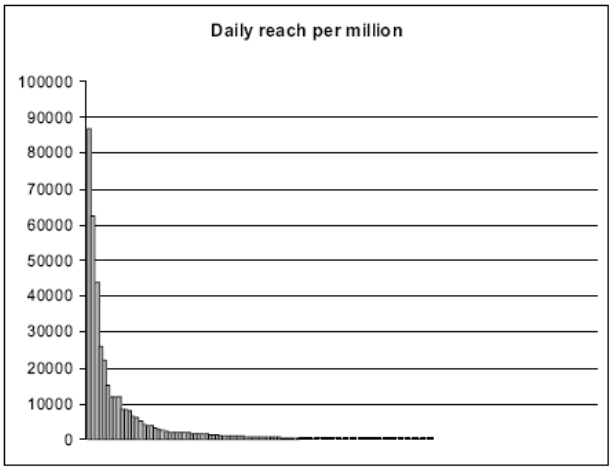
research results show a drastic growth of Internet use the past few years. In the Netherlands, the SCP has investigated that almost 80 percent of the population now has access to the Internet, compared to 28 percent in 1998 and 74 percent in 2004 (SCP, 2004). For example Pew shows that in the United States, between 2001 and 2005, the number of American adults that used the Internet to develop or display photos rose from 23 million to 49 million (respectively 20 percent and 34 percent of the Internet population these years) (Madden & Fox, 2007: 3). And the market share of an application like Wikipedia has risen from 3 percent in august 2005 to 21 percent one year later.

These data are very convincing and do provide a strong indication that the uptake of Web 2.0 services is really taking off. However, little efforts have been made to systematically assess the impact of the Internet and Web 2.0 services in all its depth. Pascu et al. (2007) have started to provide insights in this area. They made an assessment of the development of new Internet technologies. Their study primarily investigated the socio-economic impact of these new Internet technologies. Pascu et al. state that the past three years have clearly shown a 'dramatic growth in take-up' of Internet technologies. To underline their arguments, Pascu et al. use both formal and informal sources; for example the rise of the number of blog entries, revenue of services like eBay, the rising number of authors providing content on Wikipedia and the number of broadband subscribers. Overall, first results of research being done in this field show that Web 2.0 services are being deployed on a large scale.

3.2 The uptake of Web 2.0 services

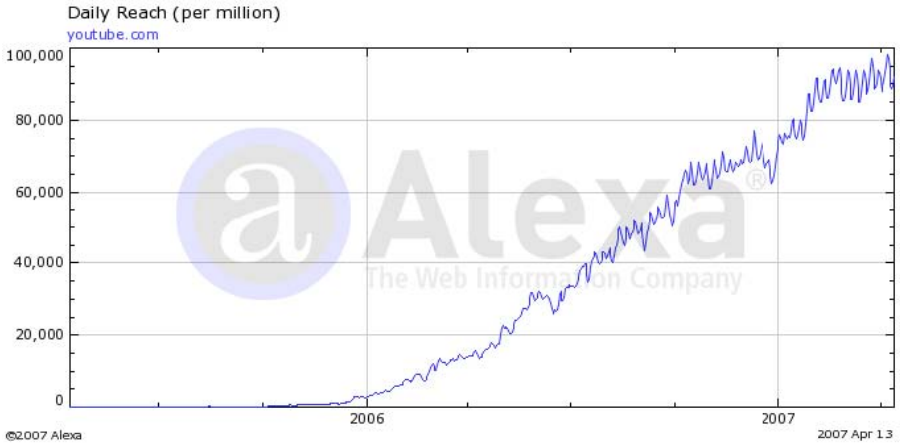
Looking in more detail at our case sample of 139 Web 2.0 services, we can try to be more specific. How often are these services used or visited? Accurate information about number of visitors or users is hard to obtain. Some services indicate the number of members or visitors themselves, but it needs to be underlined that the way these figures are measured is often obscure. Use figures provided by the services themselves differ from 30 billion page views a month (Facebook) to 100 million visitors a month (eBay), to 200 (9rules). These figures do not provide any reliable information about the uptake of the Web 2.0 services in our sample. We can also look at the number of members the services have. A quarter of all services give an indication of the number of registered users/ members. This figure differs from 100 million members in the case of for example MySpace and Skype, until 30.000 members in the case of Ning (a website where users can create their own communities). On average, the services have almost 12 million members each. Because of the large differences between services, a more accurate measure may be the median, which is 2 million.

Figure 2 Daily reach of Web 2.0 services in case sample



A more structured indication of web traffic is provided by Alexa. This service (used by Godin to construct his Web 2.0 Traffic Watch list) gives an indication of web traffic per day. It measures how many of 1 million users visit the service on an arbitrary day (daily reach per million). The traffic generated by the Web 2.0 services in the sample varies from 87.000 for a service like YouTube until 25 for B2evolution – a free blogging tool (see for an overview of all services Figure **2**). Considering that there are more than 1 billion internet users, even 25 still is a large number of people. The average traffic for the services in the sample is almost 3000, but also here; the median is much lower and accounts for 280. To illustrate the fast rise of Web 2.0 services, Figure 3 shows the rapid uptake of YouTube since 2005.

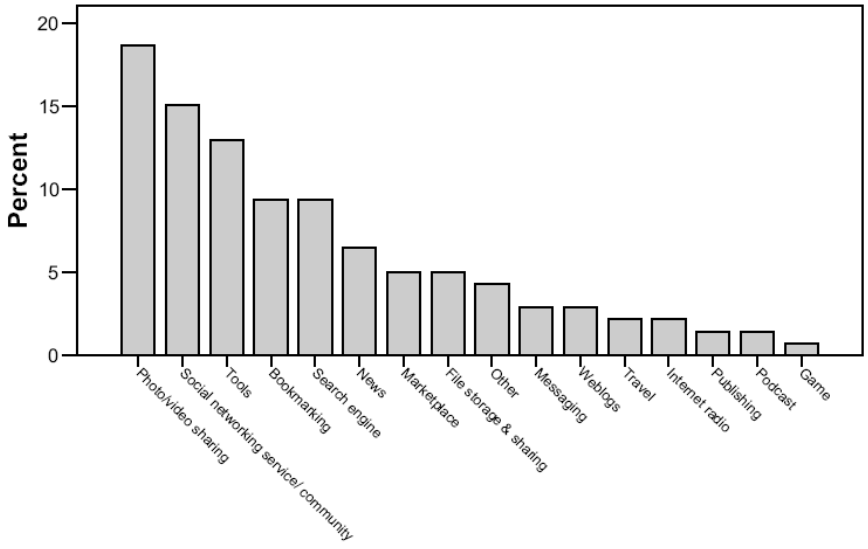
Figure 3 Overview of YouTube's daily reach (source: Alexa)



Comparing these services with Web 1.0 services – cnn.com has a traffic figure of 11.000, the website of the British Encyclopaedia Britannica has a traffic figure of 350, while Wikipedia counts 62.500. The Washington Post is measured for a daily reach of 2200, which is as much as the daily reach of Bloglines – a news feed aggregator. Kodak gallery has a daily reach of 600 – compared to the traffic generated by Flickr: 12.000. Looking at these figures, it can be stated that Web 2.0 services are generating a lot of traffic, often even more than Web 1.0 services do.

3.3 The nature of Web 2.0 services

Table 2 Classification of Web 2.0 services (N=139)



Besides estimating the uptake of these Web 2.0 services, it is also of importance to indicate the nature of the services we have been studying. **Error! Reference source not found.**
presents a classification of the Web 2.0 services in our case sample. Most services provide users with the opportunity to store and share content like photos and videos. These websites are primarily directed at user-generated content. Social networking and community websites are also clearly present in the Web 2.0 domain. Besides MySpace, Orkut and Friendster, many other social networking services have come into being. For example Meetup, which provides people with the same interest a platform to find like-minded individuals in their neighbourhood. They meet up in real life. The service intends to vitalize local community. Other communities have different goals, but they all focus on connecting people with similar

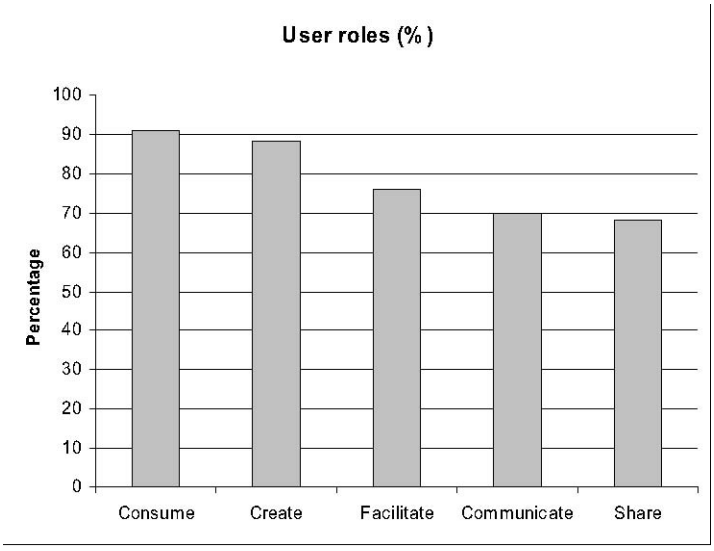
interests. Also the services that provide user tools are often focussed on social aspects. Ning is a tool that lets users create their own social networks. Users can make easy personal pages with Peanutbutter, personalize their start page with Netvibes or Pageflakes and collaborate with others through the Basecamp tool.

3.4 Summarizing

To sum up, looking at various research outcomes, most evidence underlines that the new generation of web services in general are taken up very rapidly. There has been an exponential growth of the uptake and use of services with Web 2.0 characteristics. Specifically services that focus on sharing and storing content (like YouTube and Flickr) and social networking communities (like MySPace, Orkut and Friendster) are very popular among users. Sharing, finding, saving, connecting and communicating seem to be the key aspects of the services in our case sample.

4. Societal re-engineering

Figure 4 Classification of user roles in Web 2.0 services



In the introduction to this paper, we have stated that active users are the linchpin of Web 2.0 services, as they thrive on active interactions between and connectivity of users. To support and refine this statement,

we analyzed this 'user activity' by focusing on the kind of roles users were allowed to play. The roles were categorized as consuming roles, creating roles, sharing roles, facilitating roles and communicating roles. Figure 4 shows the classification of user roles in the Web 2.0 services of the case sample. All user roles are frequently enabled by the services – which indeed indicates strong user activity.

Looking at 139 services, it becomes clear that these roles are rather diversified. For example consumption not only consists of reading, viewing and listening. Users are also enabled to search, download, buy or play. Below, per user role the outcomes of the analysis will be discussed. We shall pay attention to the way these roles are divided into sub-roles and what users do most.

4.1 Consuming

Consuming content is the most passive role for users, for it is the stage in the value chain where the value of a certain product is transferred to the user. This is the case when a user buys a product, or uses a product, for example by reading or viewing content. If websites offered the user the opportunity to find and consume the content, this was labelled consumption. Consuming still is the main activity of users online; 91 percent of the Web 2.0 services offer some kind of content to be consumed. Many services, 78 percent, also allow users to search their website or database. Some services fully focus on searching functionalities, for example personalized search engines. Finding things online is very important. 66 percent of all services offer their users material to view audiovisual content on their website – for example photos or video. In 31 percent of all cases – videos are directly streamed on the websites. Only in 19 percent of all cases, users can download movies. 32 percent of all services in the case sample were offering their users reading material – for example news messages or weblogs online. In 16 percent of all services, users were offered to buy things online. 14 percent of the services provided audio content and only 4 percent let the users play a game.

4.2 Creating

Opposed to traditional web services, users are more and more offered the opportunity to create their own content. In 88 percent of all cases users were in one way or another creating their own content. But content creation can be measured at different levels. In 43 percent of all services, users can create and upload their own content – for example movie clips or photos. Users also often are enabled to write their own weblog. Customization is a different form of user generated content. This is a more limited form of content creation, because users are only allowed to *adapt* a service, existing content or products as they please. This adaptation is only allowed to take place within given limits, pre-ordered by the service. In 35 percent of the services, users were enabled to customize something in the services. Often, users are

allowed to customize their own personal profile – change colours, add pictures etcetera. One quarter of all services allows users to contribute. They can add something to a website – for example a review or their own story.

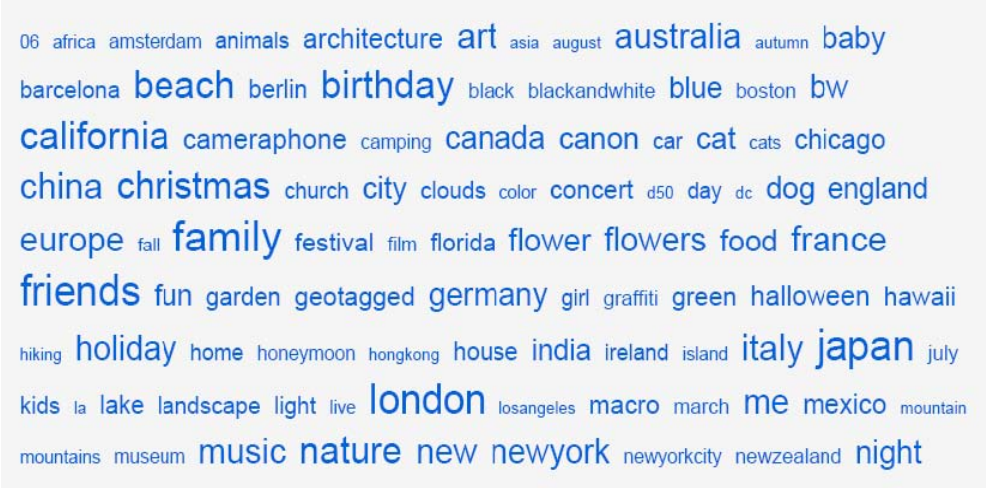
4.3 Sharing

Web 2.0 services also enable users to share content and thoughts on a large scale. 68 percent of the services have a sharing functionality. Half of all services allow users to publish their own work – audio, video or text. Users can upload their work on these services in 47 percent of all cases. Almost one third of all services allow users to send their content or a link to their content directly. However, there are only a few services that use a P2P network to allow users to share content. This indicates that these services are only semi-open. They enable users to take on many different roles, but the way the services are operated do not change the hierarchical organisation of the service.

4.4 Facilitate

In 76 percent of the online Web 2.0 services, users take on facilitating roles as well. They not only facilitate their own activities, but also help others. By adding keywords (tags) to content, users make searching content more easy for others. Almost half of all services (48 percent) allow users to tag content. Some services offer tagclouds. These are "clouds" with keywords, such as in the example (Figure **5**) below, where the most popular tags are shown that are applied to photos at Flickr.

Figure 5 Tag Cloud on Flickr (Flickr.com)



The more often a certain keyword is used, the larger this word shows in the cloud. The tagcloud shown in Figure **5** shows that more people have uploaded photos about their family and London than photos with the keyword honeymoon. By tagging, users make searching more easy. In 45 percent of all services, users can subscribe to each others content – or the content of the service. Often RSS feeds are used to accomplish this. Some services even let users burn feeds themselves. 25 percent of the services allow users to filter or channel. They either can decide for themselves which users can view their content, or users can categorize their content into channels. Users can also recommend content to others. This is the case in 22 percent of all services.

These facilitating user roles are exemplary for the developments in the online domain. Social bookmarking has become very important. Instead of traditional taxonomies (central classifications of content) users are creating these classifications themselves. This activity has come to be known as folksonomy. Because users themselves create metadata and help others to find relevant content, they have become information brokers themselves. This guiding and gate keeping task traditionally was taken up first and foremost by business parties. Examples are Google in the online domain and traditional creative industry firms like record companies in the offline domain. These powerful gate keepers determined to a large extent which music would be sold in the stores and played on the radio.

4.5 Communicating

Communicating is another important feature of Web 2.0 services. Almost 70 percent has some sort of communication functionality. More than half of the Web 2.0 services allow users to comment on others. In 42 percent of all services, users can directly send a message to other users. Marking content is another activity users can take on in these services. In 35 percent of all services, users can give ratings; they can judge content – and even other users. Direct chatting is not as popular. Only 15 services, 11 percent, offer users the possibility to directly chat with one another.

4.6 Summarizing

Societal re-engineering is indicated by the shift from top down to bottom-up dynamics, characterized by new user roles in Web 2.0 services. Traditionally, users were mainly consumers of content. But on the Internet, they are enabled to take on many different roles – which they have done on a large scale and which in turn has influenced the innovation dynamics underlying the rise of the new generation of web services. These user roles have been illustrated above. Users have started creating content on a large scale. They share this content and thoughts with each other through the Internet. Furthermore, hierarchically defined taxonomies are more and more supplemented and possibly replaced by folksonomies

based on collective intelligence.

These developments are in line with various researchers that have pointed out that users are increasingly important. Toffler (1980) already indicated that users were increasingly combining their consuming role with producing tasks, for which he has introduced the famous phrase “prosumers”. Some years later, Leadbeater (2004) coined the term pro-ams, referring to amateur users who where more and more professionalizing their activities. According to Leadbeater, innovations where often not diffused through a pipeline, but initiated more bottom-up (swarms of innovation). Furthermore, Von Hippel (2005) has written extensively about the impact of users (lead users) on the innovation process in his book *Democratizing Innovation*.

5. Creative institutional destruction

According to Perez, the ‘golden age’ of a new technology is also characterised by creative institutional destruction. One hint that things are changing are the rise of innovative user roles as explained above. But it takes more for a society to develop in ‘newly engineered’ ways. Do new and innovative user roles make a difference or are they merely incorporated into more traditional ways of organizing business as usual? A sign of creative destruction may be that new business models are beginning to develop, expressing shifts in ‘patterns of production, consumption, organization, management etcetera’ (Perez, 2002:153). Therefore, in our analysis we have made an attempt to unravel some of the features of the underlying business models for Web 2.0 services.

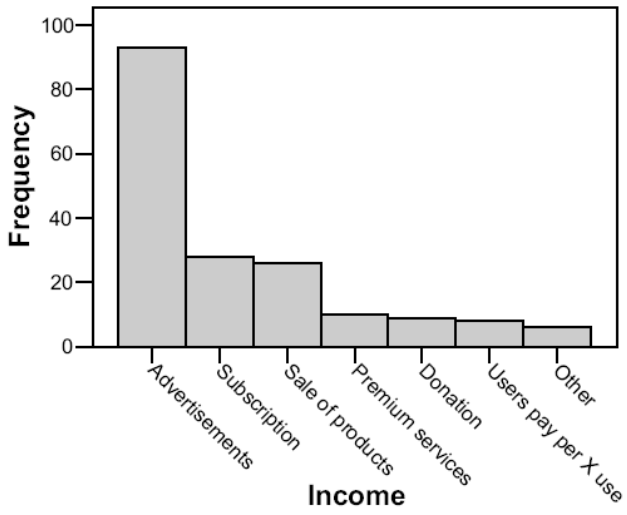
We will discuss two important basic features of this conceptual model. Firstly, the revenue models of Web 2.0 services will pass in review. Changing revenue models are an important indicator of the destruction of old business models. But as we have explained, a business model is more than only a revenue model. We use a conceptual framework building on four layers that all add something to the companies’ value offering, as is shown in Figure 1. Therefore, next to the revenue model, we will also pay attention to technological aspects of the Web 2.0 services – more concrete – the openness of these services for change. The value proposition of the services has already been subject of this paper in the above section about societal re-engineering. Therefore this part of the business model will be taken together with the value network concept. These two concepts will be illustrated by an example.

5.1 Revenue models

More than half of the services (67 percent) make money by placing advertisements on their websites (see Figure 6). Most services use Google Adsense, which arranges for the advertisements to be adapted to the

content of the service. This is basically no different revenue model than more traditional forms of media have. But there are also other and often complementary revenue streams for Web 2.0 services. 20 percent of the services in the case sample had some sort of subscription service. Users were offered extra functionalities or for example extra storage capacity for a monthly fee. Other services (19 percent) offer their users actual products on their website. A smaller selection of services (7 percent) use premium services, add-on services users have to pay for, or charge users per X use (6 percent). Most websites that are offered by individuals or are part of open source projects ask their users for voluntarily donations; these websites often do not contain any advertisements and count for 7 percent of all services in the sample.

Figure 6 Revenue of Web 2.0 services



From the case analysis, one striking characteristic is that 17 percent of all services share income with their users. This is a much larger percentage than we had anticipated before the analysis. And it is a very interesting new aspect of Web 2.0 services. In what ways do services share revenues with their users? Services that share revenues most often are photo and video sharing websites (35 percent), news services (17 percent), social communities (17 percent) and marketplace websites (13 percent). In most of the cases, services share their advertising revenue with their users. This is not surprising – considering this is the main source of income for most Web 2.0 services. But there are also other possibilities.

There are several services, for example iStockphoto, or Fotolia that allow users to display their own photos as 'royalty free' images. Other users or business parties can buy these photographs at different prices and the user will receive an incentive per photo sold. AssociatedContent, a news website, screens all content

that has been send in by its users. They will buy content they find interesting enough to attract other users. The service itself makes money out of the advertisements shown on the website. Another news website, Nowpublic, enables users to write their own news stories online. They do not apply a strict selection. Other users who find the stories of one particular user interesting, can make a voluntarily donation. Squidoo, a bookmarking and recommendation site, not only shares advertisement revenues, but also affiliate revenues when a user recommends a product from a commerce partner (for example Amazon or eBay). At IMVU, a 3D chat application, users can earn money by making content (for example objects or environments) when they have obtained a pro developer status. Sometimes, the revenue share grows when a user has build a solid reputation online.

How popular are these services among users? According to the Alexa service, these services on average generate traffic measured at 605 per day. This is below average, but the median is 400, which is above the general case sample median. Subsequently other services (for example YouTube) that have not yet taken this step of letting users share in revenues are exploring this option as well.

5.2 Open or closed technology

Most services are relatively open. Almost all services, 94 percent, offer their basic functionalities free of charge. They are very accessible and often have a user-friendly interface. The services are mainly web-based – 85 percent of all services can be used without installing software. This lowers the threshold for participation.

But it needs to be underlined that services are not completely open. Users do need to log-in to make use of the main functionalities. Technology is often deployed to enable users to navigate easily the website functionalities. As has been shown in the previous section of this paper, users are relatively free in Web 2.0 services to create content themselves, add things and personalize the services they use. The analysis of the case sample also shows that many services offer users the possibility to combine different services. I can for example upload my Flickr photos on my social community network, or automatically bookmark certain services on my del.icio.us account. These characteristics imply that most Web 2.0 services truly use technology in an open way.

But looking more closely, this statement deserves some modification. If services would be truly open, users would also be enabled to tinker with the technological framework of the service, as is the case with open software projects. Or users would be enabled to control the data sharing themselves, as is the case in P2P file sharing networks. Our analysis shows that only 7 percent of the Web 2.0 services is actually based on open source software. Furthermore, only 1 percent uses P2P technology for file exchange. Nonetheless, if you compare these Web 2.0 services with ‘Web 1.0 services’, users do have many more opportunities to

interact than before. Therefore, the way businesses position themselves on the Internet can be classified as semi-open.

5.3 Value network and value proposition

Many services strongly rely upon their users for value. Therefore, attracting enough users is extremely important. A social networking site without users can not provide a lot of value. A video website without users uploading videos is of no use either. How do businesses optimally exploit connectivity and the new user roles that have been explained earlier in this paper? As has become clear looking at the technical specificities, services provide users a low threshold for participating. They often do not have to pay for basic functionalities and the services can be used from any location without users need to download software. Services also often position themselves as cooperating with other services. At least one third of the services in the Web 2.0 case sample were explicitly offering functionalities linked to other services. Many weblog and social community services enable users to incorporate their Flickr photos or YouTube movies directly into their account. Photos can be placed on location maps ("Google mashups") or websites can be automatically added to bookmarking accounts. These features enhance the value for users.

The more users participate in these services, the higher the network effects are. One example of a service that heavily relies on these network effects is Couchsurfing (couchsurfing.com). This hospitality service connects users that are travelling abroad in real life. The service provides travel information and offers users contact addresses in the countries they are going to visit. This service makes travel agencies and even hotels obsolete. Users offer each other a place to stay. To provide an extra safety measure, the site uses an extensive status system (vouching and verification) to make as sure as possible that the users are reliable.

Another example of a service that tries to maximalize user value is iStockphoto. As has been described, many services try to keep the threshold for participating as low as possible. They try to obtain as much users as possible. But iStockphoto employs a different strategy. Every user that wants to upload photos to their website is screened. The quality of the photos must match certain pre-defined criteria. If users are allowed to participate, they may upload photos and share revenue with the service when their photos are sold. By being selective, iStockphoto tries to improve its value for others.

5.4 Summarizing

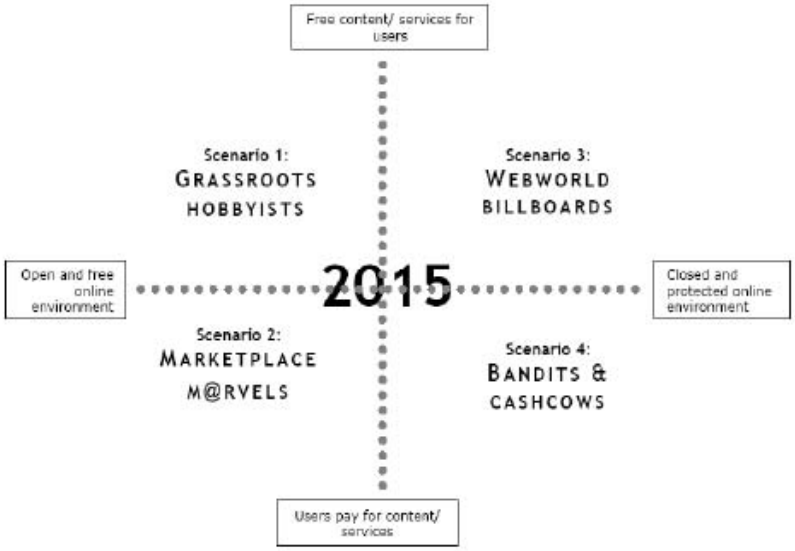
Summarizing, changing revenue models of Web 2.0 service point to some first signs of creative institutional destruction. Users are increasingly incorporated into the revenue model of services. Not only as paying actors, but also sharing revenue with business parties. Looking at other elements of the business model of

Web 2.0 services like the value proposition and the way services are cooperating, it becomes clear that services are creatively employing their users' activities. Many websites of more traditional media services like newspapers and television stations are also increasingly incorporating Web 2.0 characteristics into their services. On the BBC website for example, users are invited to send in their own photos or comment on news messages. Most Web 2.0 services try to be as open as possible to attract many users and optimally create value. On the other hand, figures about open source projects and P2P file sharing indicate that truly open in technological sense are only a few. We may therefore conclude that up until now, only 'relative' creative destruction can be discerned.

6. Future directions

As has been outlined in the previous section of this paper, Internet characteristics, combined with user activities push, and at the same time enable companies to reorganize their businesses. Business models are changing. New parties enter the field. Businesses have also started to incorporate user roles into their business models. But the developments still raise many questions. One of the uncertainties coupled with user roles, concerns the further development of the Internet – will it remain a relatively open environment where users can freely move around, or will it develop into a more closed environment. A second uncertainty concerns the way revenue models are going to develop. Will services remain free of charge or will users increasingly need to pay for online services and content when these services have become a natural part of everyday life? Will the characteristic of users sharing in the revenue of the services further develop? How will services organize their business in the future, and what consequences will this have for user roles? These uncertainties can be further analyzed by conducting a scenario exercise.

Figure 7 Scenario quadrants (Source: Slot, 2007b: V)



In the context of the B@Home project (a Dutch research project focusing on the future of broadband multimedia services in the home), a scenario exercise was conducted that analyzed these uncertainties (Slot, 2007b). Four scenarios where constructed for 2015 along two axes: free content/ services for users versus users pay for content/ services, and an open and free online environment versus a closed and protected online environment.

Looking at the axes, four scenarios are defined (see Figure **7**). Scenario one is called *Grassroots Hobbyists*. This scenario (free content/ services in an open and free environment) is characterized by bottom-up developments. Users are active participants, creators, producers and distributors. Firms have no clear revenue models. Because users have taken the lead, they play a small part in the innovation process. Scenario two, *Marketplace M@rvels*, (users pay for content/services in an open and free environment) has the same characteristic as scenario one, considering the open and free online environment. But in contrast to scenario one, where business parties were not making any money, new revenue models have been developed that allow content and service providers (sometimes also users themselves) to earn money. The third scenario is called *Webworld Billboards*. In this scenario (free content/ services for users in a closed and protected environment) user communities are exploited as marketing machines. Users act as gatekeepers and rate and tag content. Innovation is a continuous process and businesses act as facilitators

and content providers. In *Bandits & Cashcows*, the last scenario (users pay for content in a closed and protected environment) the main characteristic is the utilization of strict copyright protection. Businesses are very scared of copyright infringement, and users fear for their privacy. Users and businesses are strictly separated and innovation is hampered by harsh copyright protection.

We will not discuss these scenarios in great detail in this paper[3]. But it might be interesting to highlight some of the main issues presented in the scenarios.

6.1 Main scenario issues

The four scenarios enable different user roles. In two scenarios, the online environment remains relatively open. The Grassroots Hobbyists scenario as well as the Marketplace M@rvels scenario enables users to take on many active roles. In the latter scenario, users even earn money with their activities on a large scale. If the Internet develops into a more closed and controlled online environment, user roles will be much more constrained. The Webworld Billboards scenario still permits users a limited form of freedom. They can still be active in online communities (this is also stimulated by businesses), and can also actively share things with each other. But still, Internet has changed. Users have to register more extensively and user identity is coupled to mobile phones. Content can only be shared in streaming format. Most limitations are present in the Bandits & Cashcows scenario.

The level of openness not only influences the way users can behave, but also the possible interaction between users and businesses. The more freedom for the users, the more two-way interaction will develop in the future. In the Grassroots Hobbyists scenario, the users enjoy great freedom. They can take on many roles and can use services and content for free. In this scenario, the roles for traditional business parties are declining. Businesses will have great difficulty developing viable business models. Users will not represent monetary value for businesses online – they will primarily take the users as a source for the offline product development.

On the other side of the spectrum, in the Bandits & Cashcows scenario, we see a different development. The more closed the network and the more often users have to pay for online content and services, the more limited user roles become. Internet is characterized by one-way traffic. Large multimedia corporations will create walled gardens. Users are seen mainly as consumers. They only have access to controlled and approved websites. Users are severely restricted in putting content online themselves. They need to go through an authentication process before they can enter the Internet. This is more of a top-down model.

Scenarios two and three steer a middle course. The dynamics between users and business are characterized by top-down as well as bottom-up interaction. Users need businesses for their experiences

[3] For more information about this project, visit http://www.userproducer.nl/future-users.html

and facilities like servers. Businesses are providing the outlines and edit content to make it more attractive for the users. They facilitate users technically and editorially. Because the threshold between users and businesses is extremely low, they can constantly interact to improve the services they offer. Businesses need users for their input, user base and information. The market has splintered into thousands of niches, and companies need users to make sense of this. Because many similar services are online, competition is fierce. Internet is an open environment and users demand the right to use their content in many different ways and access their content on different platforms.

Thus, even if Perez' model of deployment is applicable to the Internet development, the way this uptake is going to take shape in the coming years, depends on many decisions. We should be aware that decisions about the character of the network are affecting user roles and the interaction between users and businesses. There still are a lot of uncertainties in the online domain. These uncertainties are not going to be solved here. But it needs to be underlined that ongoing research about the online developments and the roles of users is crucial in understanding ongoing developments.

7. Concluding

We have started this paper by stating that users were crucial for the development of the 'golden age' of the information society. Taking Perez' concepts that mark a period of more stable growth, we have first analyzed the deployment of Web 2.0 services. Various researchers have shown that the Internet in general is taken up very rapidly and on a large scale. There has been an exponential growth of the uptake and use of services with Web 2.0 characteristics. Our analysis has shown that particularly services that focus on sharing and storing content (like YouTube and Flickr) and social networking and communities (Like MySPace, Orkut and Friendster) are very popular among users. Sharing, finding, saving, connecting and communicating seem to be very important aspects of the services in our case sample. Thus it is fair to conclude that the stage at which we are now, can indeed be described as a phase of high (and still growing) deployment. However, there are more characteristics that should be taken into account.

According to Perez, a key characteristic of the deployment period is societal re-engineering. To make an assessment of this concept, we analyzed new or innovative user roles. We have shown that Web 2.0 services enable users to take on many different roles, which reflects the active involvement of users in the appropriation process of these services. Traditionally, these were often reserved for business parties. Users have started creating content on a large scale. They share this content and thoughts with each other through the Internet. Furthermore, hierarchically defined taxonomies are more and more replaced by folksonomies based on collective intelligence. The empowerment of the user is an indicator for this process

of social assimilation.

A third concept we have studied to complete our analysis, was the level of creative institutional destruction. Creative destruction could be indicated by new business models underlying Web 2.0 services. The results show that most businesses still rely on advertisements as their main source of income, just like traditional media companies have done for years. This does not indicate any changes. But our analysis or revenue models of Web 2.0 service indicates that hints of creative institutional destruction can also be detected. Users are increasingly incorporated into the revenue model of services. Not only as paying actors, but also to have a share in the revenue. Looking at other elements of the business model of Web 2.0 services, like value proposition and the way services are cooperating, it becomes clear that services are creatively employing their users' activities. But it also needs to be underlined that the openness of these services can be questioned. Figures about open source projects and P2P file sharing indicate that only a few services are truly open in technological sense. We may therefore conclude that up until now we can only see indications of 'relative' creative destruction. Although substantial changes in the organization of business models, are noticeable, there still are no strong indications that traditional hierarchical relations are fundamentally changing.

We think that Internet developments indeed have taken us to a second stage of sustainable growth, characterised by high deployment and a better match between the 'new' technology and the socio-economic context in which it is deployed and embedded. Since we are at the very beginning of this period, we still have some doubts about the classification of this age as a "golden age". Still, a lot of uncertainties exist. These have been highlighted in the section of this paper about the possible future.

7.1 Research note

Although our analysis of Web 2.0 services does shed some light on the nature and use of Web 2.0 services, it needs to be underlined that we are still at the beginning of this exploration. The data that we have used still needs to be further supplemented and refined. Furthermore, to enhance the analysis, more data should be collected that shed light on traditional user roles and business models. Our explorative approach also could benefit from some conceptual refinement and more data should be collected. Nonetheless, this exercise has proven to be a first step in a very interesting direction.

7.2 Follow-up

A lot of interesting questions remain unanswered. There are many questions that concern policy implications. As Pascu et al. have already stated, "The development of Internet 2 applications also opens a wealth of policy-related research questions". For example how countries are going to approach global

Internet issues, or the way we are going to deal with intellectual property rights. These questions will prove a true challenge to policy makers.

But also in terms of social and economic impact, user roles still need to be further investigated. What is driving users to take on this variety of roles and how are they going to behave in the future? These issues are inextricably linked with business-related questions. Will the market stabilize and will businesses be able to structure user behaviour or make a decent living out of their Internet activities? These questions seem relevant from scholarly as well as market point of view. Since we are only at the beginning of the period of high deployment, the online domain will be a continuing source of research material. We need to collect more and reliable data on online services and user behaviour. This paper is a first small step in this endeavour.

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