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The Management of Web 2.0 Services Development Life Cycle

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ABSTRACT

This study is motivated by the prospect of harvesting the collective intelligence of the Internet via Web 2.0 services and aims at building a framework for the management of Web 2.0 services development. By reviewing specific features of Web 2.0 services, we identify the acquisition of co-creators and viewers as the most influential task of Web 2.0 service development. Based on impression management theory and two typical Web 2.0 cases—Facebook and Wikipedia—we distinguish four phases of co-creator and viewer development throughout the life cycle of Web 2.0 services. The four phases are: model establishment, innovation dispersion, community expansion, and service re-invention. Besides, we also identify four dimensions of the management of Web 2.0 services development. The four dimensions are: co-creator, content, control, and dynamic capability. The four phases and the four management dimensions of Web 2.0 service development life cycle are then validated by industry experts and enriched by six Taiwan Web 2.0 service cases—PlaySport, iPeen, AnswerBox, ihergo, MyGo and WEnews. It is hoped that the elaboration of the life cycle of Web 2.0 services development can provide strategic input into the management of Web 2.0 services.

KEYWORDS

Web 2.0, Web 2.0 service, Web 2.0 service life cycle

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CONTENT

TABLES

FIGURES

CHAPTER 1: RESEARCH OBJECTIVES AND RESEARCH BACKGROUND

The World Wide Web has been considered the new digital era that makes it possible to tap into mass collaboration on a greater scale than ever before, dramatically altering every aspect of modern life (Tapscott and Williams, 2006). Web 2.0 is the network as a platform on which everyone contributes to the development and diffusion of content, tools, or software applications, and Web 2.0 applications are those that make the most of the intrinsic advantages of that platform (O'Reilly, 2007). With the advancement of Web 2.0 technology, service providers can leverage the collective intelligence through the Internet and build different service models to develop all kinds of social communities.

Existing studies have offered a broad range of research on the value of Web 2.0 services in specific fields. For example, Bonabeau (2009) pointed out that tools using collective intelligence can perform in decision making better than theorists can explain. Siddiqui (2009) stated the Web 2.0 platform can improve personal productivity and professional development for knowledge workers. However, research to date has not explained how the platform should be developed in order to grow and sustain the community. With the increasing adoption of Web 2.0 services by both enterprises and entrepreneurs in the business world there is an urgent need for a complete understanding of the development of Web 2.0 services throughout the life of knowledge sharing and collaboration.

Based on the number of one-time adopter of the innovation Rogers (2003) suggested a six-phase model of innovation development from recognition of a need or a problem, through research, development, and commercialization of an innovation, to diffusion and adoption of the innovation by users, and finally to its consequences. The model considers innovation as an idea, practice, or object that is perceived as new by an individual or other unit of adoption (Rogers, 2003) such as the use of the laptop computer, the Xerox machine, or the mechanized harvester. The model does not consider, however, the continuity of the participation of both the content providers and the content viewers with respect to the innovative technology.

Motivated by the prospect of harvesting the collective intelligence of the Internet via Web 2.0 services, this study constructs a comprehensive framework for the management of Web 2.0 services development. The objective of the study is to identify the Web 2.0 services development phases and elaborate each phase, including the challenges of each phase, in developing the collaborative contents. We first review the definition of Web 2.0 services as well as the characteristics and challenges of Web 2.0 services development, and then we identify the critical factors of Web 2.0 services. By examining typical Web 2.0 services, we identify the phases of Web 2.0 service life, then we discuss the typical Web 2.0 cases with two industrial experts to enhance understanding of service development during each phase in the Web 2.0 service Life. Therefore, our Web 2.0 service development model is expected to be used as an analytic tool and management guideline for Web 2.0 services managers when planning and operating Web 2.0 services.

CHAPTER 2: LITERATURE REVIEW

2.1 Web 2.0 and Web 2.0 service

O'Reilly (2005) coined the term "Web 2.0," and many studies refer his viewpoint. Basically, Web 2.0 represents an era of the Web that began after the year of 2001, evolving from Web 1.0. Beside the time point of view, at the same time, it also can stand for a collection of design patterns and business models of the Web sites thriving and robust in the era. Principally, it is about how the new Web works as the network on which Web users contribute to the development and distribution of tools, contents, and software applications over the Internet (Shang, Wu and Hou, 2009).

Web 2.0 provides a nutritional space-time environment for the new service, called Web 2.0 service. In O'Reilly's (2007) viewpoint, the nature of the service is software, but the Web 2.0 service is different from the traditional software because of its user participation. From the viewpoint of the service user, "whether people are creating, sharing, or socializing, the new Web is principally about participating rather than about passively receiving information" (Tapscott and Williams, 2006, p. 37). The people who use the Web 2.0 service virtually form a community, and the community contributes to the development of the service in many ways and makes the service better. The participants could be the content providers or the interface generators. They participate in the service development when they use the service. The community is part of the service, and the service users are the co-creators of the service. Famous Web 2.0 services include Wikipedia, Facebook, YouTube, and Flickr, and all of these services have vibrant communities.

Based on the above definitions, the study considers the Web 2.0 service to be the service delivered with user participation and collaboration on the Internet. There is architecture of participation embedded in the service model of the Web site, and it causes the Web 2.0 service to get better as more people use it. This architecture enables the service users to feed the Web site with their effort at the same time they are using the service. The service users can participate in the development of the Web 2.0 service in many ways. In addition to providing content for the Web site, they can organize the information on the site, generate the site interface for themselves and other service users, or even keep the order of the virtual community. All of these participations can make the service better and better over time.

2.2 Characteristics of Web 2.0 services development

Carr (2008) mentioned numerous characteristics of Web 2.0 service development in his book. First, the special construction of the manpower greatly reduces costs but speeds up the service development. According to the concept of the "gift economy" used by Carr (2008), user-generated content is the gift, the service platform is the gift receiver, and sharing, rather than selling in the market economy, is the economic driver. Second, besides the manpower factor, the hardware resource needed to develop the service is processing power, storage capacity, and communication bandwidth, and these are relatively cheaper than the expensive equipment and laboratories required for other technology innovations. Third, the price of creating a fresh copy and distributing the service to a new customer anywhere is essentially zero due to the digital nature of the content. Fourth, the effect of business scale is positive relative to the service quality because of the network effect that the service quality is more valuable as more people use it, while the quality remains consistent in other technology innovations. Finally, these characteristics make the effect of business scale on profits an increasing one because returns keep growing as use expands without limit, while there is a diminishing return to business scale in other technology environments, which limits the size of profits. Based on the above points, most of these characteristics come from the participation of the service users.

Tapscott, D. and Williams, A. D. (2006) use prosumer　this term to …. Hence in this study we adopt service consumer instead of user.

Table 2-1 Comparison of YouTube, Microsoft and Walt Disney

Company	Employees	Market value contributed by employee
YouTube	60	$27.5 million / per employee
Microsoft	70,000	$4 million / per employee
Walt Disney	133,000	$500,000 / per employee

Table 2-2 Web 2.0 services: scale vs. number of employees

Web 2.0 services	Employees	Business scale
YouTube	60	Every day, more than 100 million videos watched and some 65,000 new videos uploaded
Craigslist	22	Every month, bulletin boards of 5 billion pages for more than 300 cities looked at by more than 10 million visitors
PlentyOfFish	1	Every day, some 300,000 people dating on site

Table 2-3 Characteristics of Web 2.0 services development

	Web 2.0 services	General tech product
Business scale versus employees	The construction of a very large business with very few people	The larger scale needs the more employees.
The price of creating a fresh copy and distributing it to a new customer anywhere	Essentially zero due to its digital content	Fixed cost
The cost of hardware	Cheap processing power, storage capacity, and communication bandwidth	Expensive equipment and laboratory
The speed of delivery to a new customer anywhere	Fast due to its distribution channel of the public Internet	Dependent on the distance between physical locations
The form of production	Social production (Massive and free labor)	Expert production
The effect of business scale on profits	Increasing returns to scale so that returns keep growing as use expands without limit	Diminishing returns to scale so that returns limits the size of profits
The effect of business scale on quality	Network effect that the quality is more valuable as more people use it	Consistent quality

2.3 Challenges of Web 2.0 services development

The development process of the Web 2.0 service has two common challenges. The first is the cold-start problem as the typical challenge (Perugini, Goncalves and Fox, 2004; Hummel, Burgos, Tattersall, Brouns, Kurvers and Koper, 2005; Julita and Lingling, 2007). This is like a chicken-and-egg problem. The Web 2.0 service heavily relies on external people to co-develop it, and a vibrant community can attract external people to join it, but a useful and interesting community has to exist first. The cold-start problem is also referred as the day-one or early rater problem, which means that few people, uses the service in the early days of the service development. Although the users of Web 2.0 services participate in the service development, they do not appear at the same time—some they join the development in the early stage, and some come in afterward.

Second, Nielsen (2006) reveals the phenomenon of participation inequality, and this introduces another problem called the de-lurk problem. The service user can be divided into two masses, one called “contributors,” who upload videos or photos or post an article, and the other called “lurkers,” who just surf and read the page without uploading anything. There is a participation inequality because most of the content is provided by the contributors (Nielsen, 2006; Tancer, 2008). In order to acquire more contributors, there needs to be a way of either getting outside users to use the service, similar to cold-start, or encouraging the inside lurkers to contribute something, called “de-lurking.” Osimo (2008) further points out the various forms of participation based on the functional complexity, and the service users can be further divided into several groups, including content producers, content raters, content reviewers, and so on. It seems that the functional complexity is negative to the size of the user group and suggests that the service should be easy to use to help create de-lurking. Therefore, the service users not only participate in the service development at different times but also participate in the different forms and therefore provide different types of contributions.

What we learn from the above literature is that the service funder should invite the service users to be the co-creators of the service, contributing their effort in various forms besides just reading the page, and encourage them to participate in the service development more frequently so as to be active users, who continuously contribute their effort. After that, the service users look like employees working for the development of the service at the same time that they use the service.

With these types of free labor, the service funder has little cost to achieve a large business. Broadly speaking, both co-creators and viewers are the co-developers of Web 2.0 services via well-designed participation architecture, which is embedded in the service model. Even viewers who only surf and seem not to provide anything for the service actually contribute something in the background. For example, they can feed the service with their clicks before they read the page, and the service automatically accumulates these clicks to reveal the most popular content. This can drive the co-creators to provide similar content to earn the "popularity of eyeball," give the service funders some directions when they need to adjust the service model, and eventually indirectly sustains the Web 2.0 services. When we manage Web 2.0 services, besides the indicators of co-creators and viewers, we should consider the third indicator, which is the contribution ratio, or the percentage of viewers who are also co-creators. This helps to evaluate the effect and cost when the service managers need to design incentive mechanisms for the two types of target users.

Table 2-4 Participation inequality in Web 2.0 services

Web 2.0 services	Percentage of power contributors	Behavior
YouTube	0.16 %	Upload a video
Flickr	0.18 %	Upload a photo
Wikipedia	3.5 %	Edit an entry

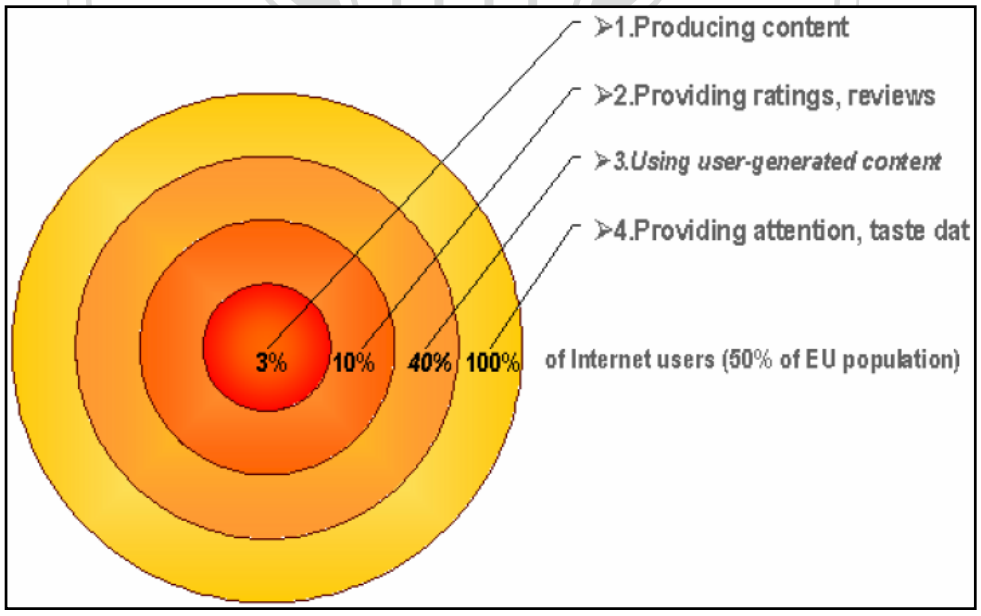


Figure 2-1 Participation inequality by functional complexity

2.4 Perspective of IM theory on Web 2.0 service development

We consider that the focus of the Web 2.0 service management is the management of user participation, and IM theory can help us to explain the different types of participants, including co-creator and viewer, the different levels of participants, including person and group, and the relations among them. Besides, we emphasize the importance of the continuity of user participation to Web 2.0 services, and IM theory can help us to explain the dynamics of user participation over time.

Impression management (IM) theory was originated by Erving Goffman (1959) and also called self-presentation or identity management. In the IM theory, there are two roles. One role is called the “actor”, who makes the impression on the audience, and the other is called the “audience”, who has the impression about the actor. IM is the goal-directed attempt to influence the audience’s perceptions about the actor regarding an object or event by providing self-assessed beneficial information in social interactions. The goal for the aforementioned attempt is to gain an advantageous first impression. The motive for this goal is based on the assumption that the target audience’s impressions about the actor become reality of the target audience. The independent variable in the IM theory is the impression made by the actor, and the dependent variable is the reality perceived by the audience, and the relationship between these two variables are mediated by the resonance between the actor and the audience.

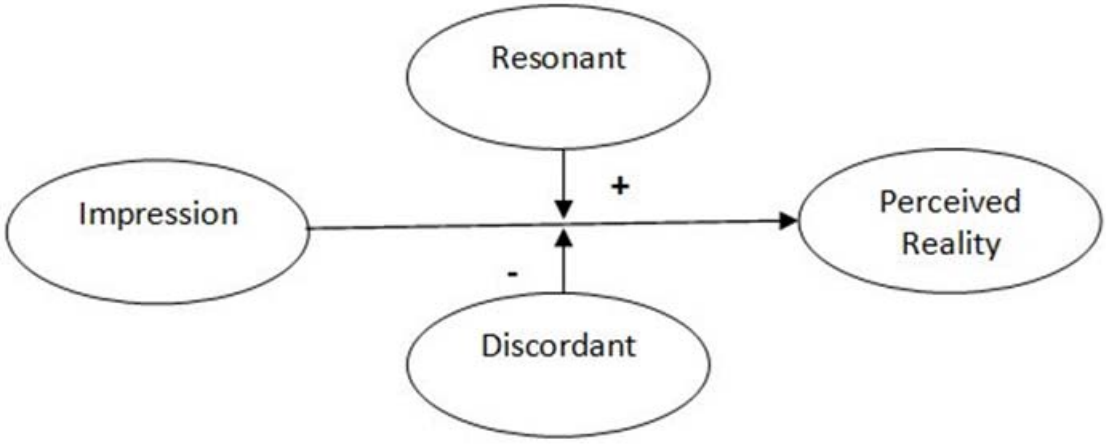


Figure 2-2 IM theory

Ma and Agarwal (2007) applied IM to explain how IT features facilitate computer-mediated knowledge sharing. They argued that IT features help the community member successfully made his impression about “who am I” to other community members and then they understood him about “who is he” with consensus to the focal person’s expectation. As a result, the community member gets more satisfied with the service and contributes more knowledge to the service when the perceived reality is closer to the impression he makes.

For Web 2.0 service managers, however, the viewpoint of Ma and Agarwal (2007) is too static and narrow because of the following reasons: (1) not to consider dynamic impression, which changes over time, (2) not to consider other possible service participants, which may not be the service members, (3) not to consider other possible management means, which may not be the IT features, (4)not to consider high level impression, which belongs to a group or whole community rather a person, (5)not to explain resonance between service participants.

We will focus the longitudinal impression management of the Web 2.0 service development to observe its dynamics in different levels, and will endeavor to find out other management means beyond IT features.

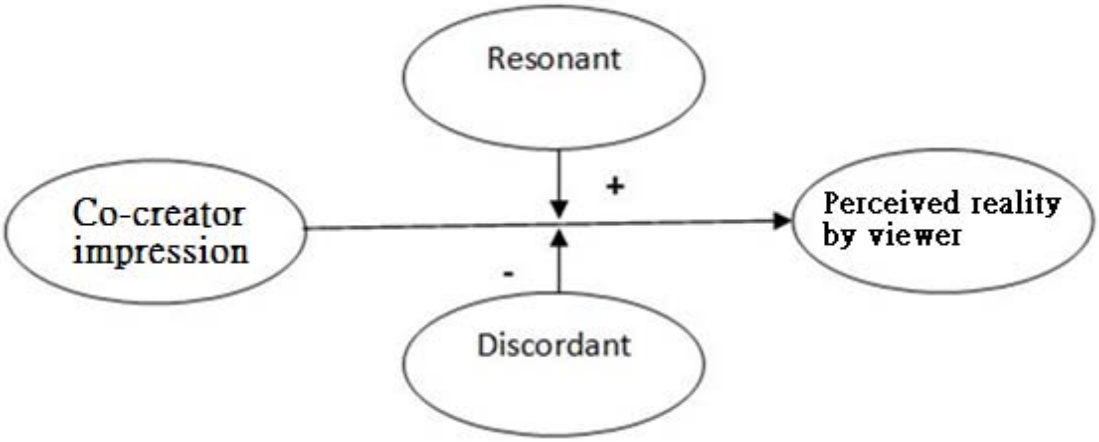


Figure 2-3 IM theory for Web 2.0 services development

CHAPTER 3: RESEARCH METHODOLOGY

Table 3-1 Research process

Steps	Why	How	Results
1. Literature Review	To find specific features of Web 2.0 services	Literature reading and consolidation	The criticality of co-creator and viewers in sustaining Web 2.0 services
2. Content Analysis	To identify the life cycle of various Web 2.0 services	Two typical cases (Facebook and Wikipedia), to review and consolidate in-case findings	Proposed four-phase life cycle of Web 2.0 services development and 4-C management dimensions
3. Expert Interviews	To understand why and how the co-creators and viewers grow or decrease in each phase;	Interview two industry experts	Verified findings
4. Multi-case Study	To understand the management in each phase	Six Taiwan cases (PlaySport, iPeen, AnswerBox, ihergo, MyGo and WEnews), to interview and conduct cross-case analyses	4-C management goals and means
5. Conclusion	To organize findings and draw conclusion	Consolidate verified findings, industry knowledge, and relevant literature	Findings and implications

The research process of this study is displayed in Table 1. First, in order to explore the Web 2.0 service-development life cycle, the study paid particular attention to reviewing related literature regarding the critical features of Web 2.0 service development. Second, we analyzed two typical Web 2.0 services, Facebook and Wikipedia, to identify different phases of the Web 2.0 service development life cycle. These two cases were selected for the following reasons. (1) Grossman (2006) in Time Magazine selected Facebook and Wikipedia as two typical examples of all Web 2.0 services (2) Various Internet marketing metrics reported by several Internet marketing research companies, including Alexa (2010), Nielsen NetView (2010), Compete (2010), Quantcast (2010), Hitwise (2010), Ranking.com (2010), and comScore Media Metrix (2009), showed that Facebook and Wikipedia are the top two Web 2.0 sites according to the traffic ranking, both in the American market and the global market. (3) Both of these cases have related statistics and rich information about the service development, and they publish it on their official Web sites (Facebook, 2009; Wikipedia, 2009) for querying.

In addition, to understand deeply the problem of participation inequality, the study collected data from multiple sources—journals, books, official Web sites, and secondary sources (e.g., reported cases by several Internet marketing research companies)—and adopted three critical indicators—co-creators, viewers, and contribution ratio—to analyze Web 2.0 service devolvement. This study adopts contribution ratio as the key factor to indentify and analyze the Web 2.0 service development because the construction of a Web 2.0 website depends mainly on co-creators to contribute while the services grow along with a critical mass of viewers. The continuity of the services is therefore based on a stable flow of participation from both co-creators and viewers. First, total page view is the most popular indicator to judge the success of a site (Cassidy, 2006; May and Kwong, 2007), and we use Alexa's Reach data (Alexa, 2010; Wikipedia, 2010a) as the viewer indicator. Co-creators is selected by the study as the second indicator because the success of Web 2.0 depends upon user-generated content. Regarding the number of Facebook's and Wikipedia's co-creators, we adopted separately the "active user" data from Facebook's (2009) and Wikipedia's (2009) official Web sites to observe longitudinally service development of the two services. The observation period for Facebook is from October 2003 to December 2009, and the period for Wikipedia is from March 2000 to December 2009. Moreover, we plot a scatter diagram of Facebook to portray the patterns of co-creator and viewer, and then we calculate contribution ratio, the formula which is "active user number / viewer number," in different phases of service development. After analyzing patterns of contribution ratio, two industry experts are interviewed for getting a richer understanding of the challenges of each phase of Web 2.0 service development. They are the managers of an e-commerce company, and they have more than four years of managerial experience with Web 2.0 applications. The experts analyzed the market condition and provided industry knowledge based on the preliminary verified findings. Finally, the study draws a conclusion based on these verified and validated results, and research results from these data are discussed below. In multi-case study, we select six Taiwan Web 2.0 services, including PlaySport, iPeen,

AnswerBox, ihergo, MyGo and WEnews. These cases are selected due to either their potential in commerce or their popularity. The selection process is showed as figure 3-1.

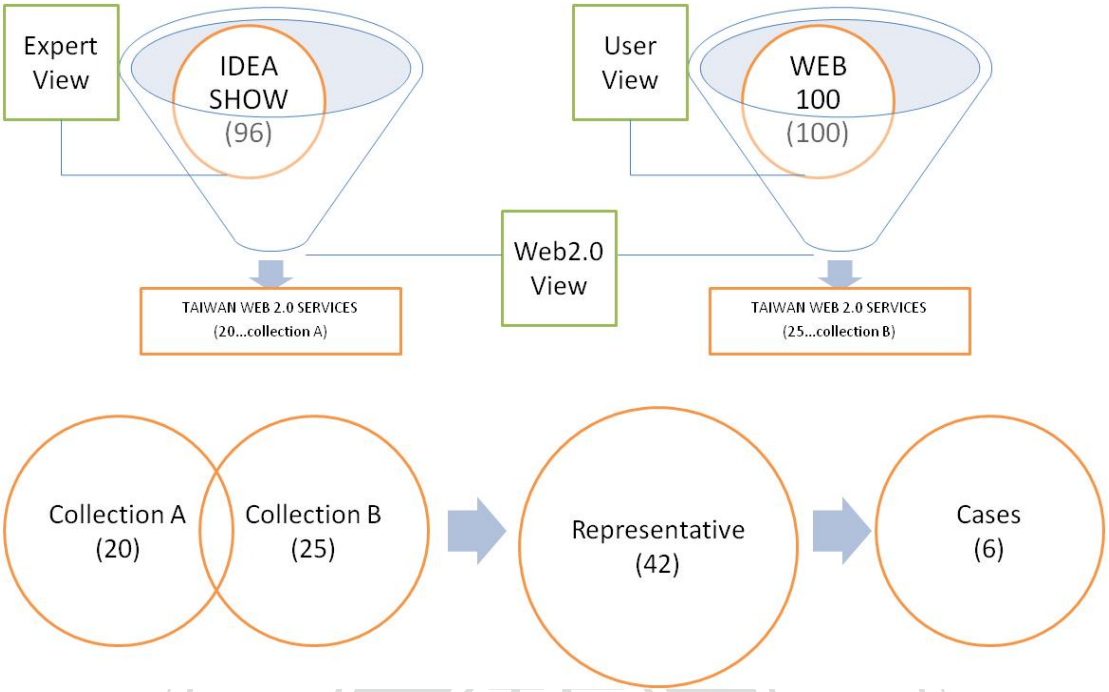
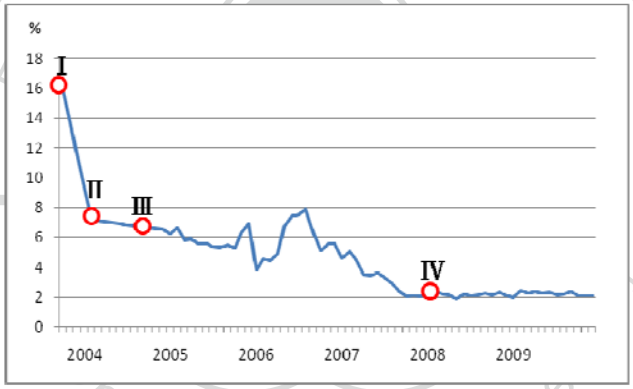


Figure 3-1 Process of case selection for multi-case study

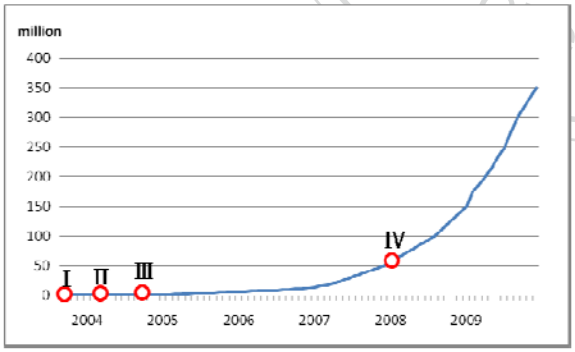
CHAPTER 4: RESEARCH RESULTS

■ Facebook

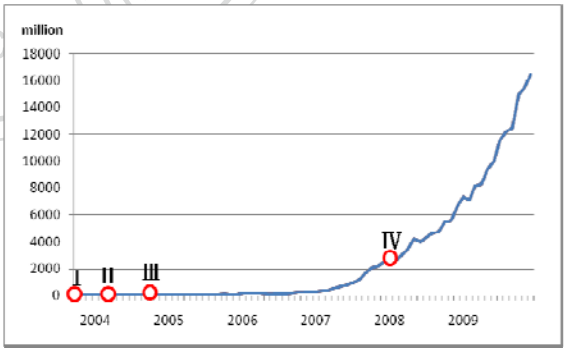
Facebook is a social networking Web site that has been operating since February 4, 2004 and is privately owned by Facebook, Inc. Anyone over the age of 13 with a valid e-mail address can become a Facebook user. Users can add friends and send them messages, and update their personal profiles to notify friends about themselves. A January 2010 Compete.com study ranked Facebook as the most used social network by worldwide monthly active users. To observe longitudinally service development of Facebook, the study used the data of "active user," defined as those who have returned to the site in the last 30 days (Facebook, 2010), from Facebook (2009) and the data on viewers from Alexa's Reach data (Alexa, 2010). In addition, we plotted a scatter diagram of Facebook to portray the patterns of co-creator, viewer, and contribution ratio, all of which are shown in Figure 4-1. The following is a discussion of why and how the co-creators and viewers grow in each changing point, as summarized in Table 4-1.



(a) Contribution ratio (active user / viewer) pattern



(b) Active user pattern



(c) Viewer pattern

Figure 4-1 Patterns of service contributors, viewers, and contribution ratio on Facebook.com

- *Changing Point I*

On October 28, 2003, Mark Zuckerberg invented Facemash when attending Harvard as a sophomore. Based on the Harvard Crimson (Tabak, 2004), Facemash represented a Harvard University version of Hot or Not to improve poor content, and it used photos compiled for placing two next to each other at a time and asking users to choose the “hotter” person. The number of active users and viewers in this period grew, but very slowly. The initial site generated 450 visitors and 22,000 photo-views in its first four hours online (Locke, 2007), and that mirrored people’s physical community with their real identities. To accomplish this, Facemash had to become an open investment in order to expand its resources in hardware and bandwidth.

In this stage, the main actor was Mark Zuckerberg, the main audiences were the students of Harvard University, and the perception the actor wished to create for the audience was that I liked to share. In order to make that impression on the students of Harvard University, Mark Zuckerberg shared photos he collected. And the students of Harvard University could perceive that impression through visiting Facemash. After accepting that impression, the students of Harvard University might imitate Mark Zuckerberg and attempted to become the co-creators of the Facemash service through providing more photos to Mark Zuckerberg. In the resonance process mentioned above, the interaction type between the actor and the audience was person-to-person. And the result of that process was that the more successfully the impression delivered and the more audiences of the photo were. Besides, the result could be measured by the impression management indexes, including unique visitor (for short U.V.) and page view (for short P.V.).

- *Changing Point II*

On February 4, 2004, Zuckerberg launched Facebook with his college roommates and fellow computer science students Eduardo Saverin, Dustin Moskovitz, and Chris Hughes from their Harvard dorm room. With the expansion of the user scale, the growth of active users and viewers was increasing gradually, but contribution ratio was decreasing because the Web site's membership was limited by the founders to Harvard students for the first two months. After that, it was quickly expanded to other colleges in the Boston area, the Ivy League, and Stanford University so that the site faced a capital shortage problem. Facebook incorporated in the summer of 2004, and Facebook received its first investment of US$500,000 in June 2004 from PayPal co-founder Peter Thiel. At the same time, Facebook moved its base of operations to Palo Alto, California. Users can create profiles with photos, lists of personal interests, contact information, and other personal information. Communicating with friends and other users can be done through private or public messages or a chat feature. However, the big problem here is that a data collection company can end up being lifelong "friends" with millions of individuals. In order to deal with privacy concerns, Facebook designed privacy settings to enable their users to control how they share their information on Facebook, because many users were not willing to permit the application to have access to all kinds

of data from their profile.

In this stage, the main actor was the member of Facebook.com, the person who had a Facebook.com account, the main audience was the public client of Facebook.com, and the perception the actor wished to create for the audience was that I liked to share more. In order to make that impression on the public client of Facebook.com, the member of Facebook.com created the personal page and shared the personal information on it. And the public client of Facebook.com could perceive that impression through visiting the personal page. After accepting that impression, the client might imitate the member of Facebook.com and attempted to become the co-creator of the Facebook.com service through sharing his or her personal information. In the resonance process mentioned above, the interaction type between the actor and the audience was person-to-person. And the result of that process was that the more successfully the impression delivered and the more audiences of the personal page were. Besides, the result could be measured by the impression management indexes, including unique visitor (for short U.V.), page view (for short P.V.), registered member (for short R.M.), and active user (for short A.U.).

- *Changing Point III*

In September 2004, the Groups application was added, and the Wall was added as a profile feature. Users can create and join interest and fan groups, some of which are maintained by organizations as a means of advertising. It later expanded further to include potentially any university student, then high school students, so that the growth of active users and viewers increased more quickly. With overloading and downtime increasing, Facebook received funds of USD$12.7 million in venture capital from Accel Partners for growth to support more than 800 college networks in April 2005, and then USD$27.5 million more from Greylock Partners. The site also announced a high school version in September 2, 2005 to attract more active users. At that time, high school networks required an invitation to join. Facebook later expanded membership eligibility to employees of several companies, including Apple Inc. and Microsoft. The company dropped “The” from its name after purchasing the domain name facebook.com in 2005 for $200,000. Then, however, a cash flow statement showed that during the 2005 fiscal year Facebook had a net loss of $3.63 million. Facebook was then opened in September 26, 2006 to everyone aged 13 and older with a valid e-mail address; however, it is difficult to prevent children’s usage on Facebook. In November 2006, the share feature was added and Facebook was simultaneously launched on over 20 partner sites. Therefore, the site during this period expanded the number of its co-creators and reviewers rapidly.

In this stage, the main actor was the specific-interest group of Facebook.com, the people who gathered together virtually based on a specific interest, the main audience was the member of Facebook.com, and the perception the actor wished to create for the audience was that we liked to share with you. In order to make that impression on the member of Facebook.com, the members of

Facebook.com gathered to form a virtual group, to create a group page, and to share the group information on it. And the member of Facebook.com could perceive that impression through visiting the group page. After accepting that impression, the member might join the group or initiate another new group. In the resonance process mentioned above, the interaction type between the actor and the audience was group-to-person. And the result of that process was that the more successfully the impression delivered and the more members of the group were. Besides, the result could be measured by the impression management indexes, including unique visitor (for short U.V.), page view (for short P.V.), registered member (for short R.M.), active user (for short A.U.), and registered group (for short R.G.). Besides, the impression the member of Facebook.com wished to created became that I like to share with you due to the group.

- *Changing Point IV*

In November 2007, Facebook announced Facebook Beacon, which was a part of Facebook's advertisement system that sent data from external Web sites to Facebook for the purpose of allowing targeted advertisements and allowing users to share their activities with their friends. After Facebook was criticized for collecting more user information for advertisers than was previously stated, Zuckerberg publicly apologized on December 5, 2007 for the way Facebook launched Beacon. During this period, it has been banned at many places of work to discourage employees from wasting time using the service and blocked intermittently in several countries including Syria, China, Vietnam, and Iran, due to privacy and other issues. For example, it is illegal to go onto Facebook in China. The government has blocked it because it is a form of freedom restricted by the government. Thus, Facebook began to adjust its privacy police and succeeded in giving people control over what and how they share information. All users could then feel confident in contributing their experience, and the contribution ratio appeared to have flattened out from 2008 to 2009. Besides advertising, Facebook cooperated with Apple iTune for music downloading to gain more revenue. Next, Facebook initiated the Open Stream Application Programming Interface (API) service for third parties to develop applications that can execute on the Facebook platform. These APIs attract considerable numbers of users and encourage users to spend more time on the site. The famous application “Happy Farm” was developed based on this mechanism. However, the users have pointed out that they sometimes get tired of all the quizzes and application notifications showing up on their news feed. Facebook then designed the “Block BF Quizzes” application to auto-block the applications of the update. Next, Facebook announced the German, French, Spanish, and Chinese (for areas outside the PRC) versions in 2008 to attract more active users. The Web site currently has more than 400 million active users worldwide. With the expansion of the scale, the users have more and more complaints about the limitation of maximum number of friends who can be invited, which is currently 5,000. In August 2009, Facebook announced the rollout of a "lite" version of the site, optimized for users on slower or intermittent Internet connections. Facebook Lite offered fewer services, excluded most third-party applications, and required less bandwidth. A

beta version of the slimmed-down interface was released first to invited testers, before a broader rollout across users in the USA, Canada, and India. This version is especially designed for mobile service, with a smaller screen size and limited bandwidth. In September 2009, Facebook claimed that it had turned cash flow positive for the first time. At that time, Facebook also announced that it would shut down the Beacon service.

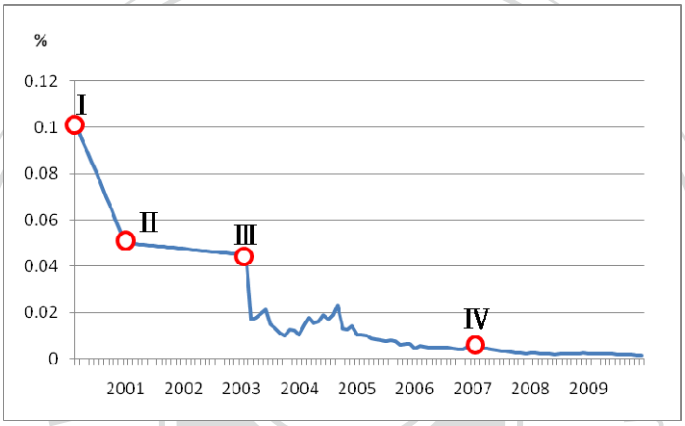
In this stage, the main actor was the whole community of Facebook.com, the people who gathered together virtually, the main audience was the external service partner of Facebook.com, and the perception the actor wished to create for the audience was that we were the major one in the social network service market. In order to make that impression on the external service partner of Facebook.com, a mass of Internet users gathered here continuously. And the external service partner of Facebook.com could perceive that impression through tasting the influence of the Facebook.com community in real world. After accepting that impression, the external service partner might attempt to build the strategic relationship with Facebook.com. In the resonance process mentioned above, the interaction type between the actor and the audience was group-to-group. And the result of that process was that the more successfully the impression delivered and the more influence of the community were. Besides, the result could be measured by the impression management indexes, including unique visitor (for short U.V.), page view (for short P.V.), registered member (for short R.M.), active user (for short A.U.), registered group (for short R.G.), and revenue. Besides, the impression the member of Facebook.com wished to created became that I was good at sharing. Accordingly the Facebook.com needed to reinvent its service to acknowledge and reward its members. For example, the Facebook.com cooperated with Comcast Interactive Media to make the Facebook Diaries; and the Facebook.com developed the virtual currency, Facebook Credits. Another impression the member of Facebool.com wished to create was that I wanted to share safely. And that pushed the Facebook.com to improve its privacy control system.

Table 4-1 Challenges of Facebook's service development

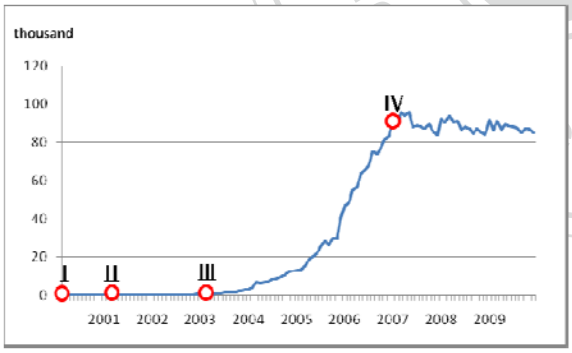
Facebook	Stage I: Model establishment	Stage II: Innovation dispersion	Stage III: Community expansion	Stage IV: Service re-invention
Period	2003.10 – 2004.02 (4 months)	2004.02–2004.08 (7 month)	2004.09 – 2007.10 (38 months)	2007.11 – Now (28 months)
Challenge	The main theme and quality of content provided	• Capital shortage • Privacy problem	• Overloading and increasing downtime • Usage limitation for different age group	• Acquiring new and retain old participants • Revenue growth • Access restriction • Hackers • Growing user demands
Revenue source	Support from Harvard	Angel Investors	Venture capital	• Advertising • Cooperation with different enterprises

■ Wikipedia

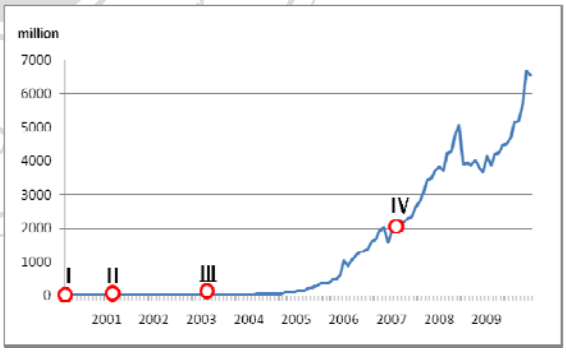
Wikipedia is a free, Web-based, collaborative, multilingual encyclopedia project supported by the non-profit Wikimedia Foundation. Its name is a combination of Wiki (a technology of creating collaborative Web sites, from the Hawaiian word meaning “quick”) and Encyclopedia. It was launched in 2001 by Jimmy Wales and Larry Sanger. To observe longitudinally the service development of Wikipedia, the study used the data of “active user,” which contributes at least five times each month (Wikipedia, 2010b), from Wikipedia (2009), and the data on viewers from Alexa’s Reach data (Alexa, 2010; Wikipedia, 2010a). In addition, we plotted a scatter diagram of Wikipedia to portray the patterns of co-creator, viewer, and contribution ratio, all of which are shown in Figure 4-2. The following is a discussion of why and how the co-creators and viewers grow in each changing point, as summarized in Table 4-2.



(a) Contribution ratio (Active user / Viewer) pattern



(b) Active user pattern



(c) Viewer pattern

Figure 4-2 Patterns of service contributors, viewers, and contribution ratio on Wikipedia.org

- *Changing Point I*

Wikipedia comes from an English–based, free online encyclopedia project called Nupedia, which was founded on March 9, 2000, under the ownership of Bomis, Inc., a Web portal company (Lih, 2009). Articles in Nupedia were written by experts and reviewed under a formal process, so that the growth of active users and viewers was very slow. To solve the content problem, Jimmy Wales and Larry Sanger decided to make a publicly editable encyclopedia and launched it on January 15, 2001 to enrich the content and try to attract more viewers. Nupedia and Wikipedia coexisted until the former's servers were taken down permanently in 2003, and its text was incorporated into Wikipedia.

- *Changing Point II*

After Wikipedia went alive in Wikipedia.com in January 2001, it gained early contributors from Nupedia. In order to attract more editors and viewers, Wikipedia set up an external cooperation relationship to attract new participants after being mentioned on Slashdot as well as in an article on the community-edited Web site Kuro5hin. During this period, it grew to approximately 20,000 articles and 18 language editions by the end of 2001. By late 2002, it had reached 26 language editions, 46 by the end of 2003, and 161 by the final days of 2004. With the expansion of the scale, the site also faced a capital shortage problem in this period.

- *Changing Point III*

In early 2003, Wikipedia planned to open investment policies, and the creation of the Wikimedia Foundation was officially announced by Wikipedia co-founder Jimmy Wales on June 20, 2003. The Foundation's board can define "community" as it sees fit. Thus, Wikipedia began to promote the Wikipedia Chapters country-specific nonprofits, which wield power far greater than their actual numbers would seem to warrant, and this mechanism can group to attract more people to participate in the development of the site. The number of Wikipedia contributors and articles were increasing dramatically during this period. Along with the fast growth of contributors, we found that there were more and more articles or figures captured from other publications without the original authors' authorization. This can cause copyright disputes and raise many arguments. In order mitigate the contention, Wikipedia now applies a review and delete mechanism to request contributors to cite the data or figure source. Reviewers are assigned the right to delete articles or figures without proper citation. Furthermore, Wikipedia also requests that contributors add links to material on an external site and ensure that the external site is not in violation of the creator's copyright. In order to block persistent violators from editing, English Wikipedia established, on December 4, 2003, an Arbitration Committee that consists of a panel of editors to impose binding rulings with regard to disputes between other editors of the online encyclopedia.

The open nature of the editing model also produced other criticisms of Wikipedia. For example, a

reader cannot be sure whether or not an article has been vandalized with the insertion of false information or the removal of essential information. Wikipedia is defended from attack by many technical methods, including automatic detection mechanisms, computer programs that are carefully designed to try to detect attacks and fix them automatically (or semi-automatically), blocks on the creation of links to particular Web sites, and blocks on edits from particular accounts, IP addresses, and address ranges. For a manual mechanism, particular articles that are heavily attacked can be semi-protected so that only well-established accounts can edit them, or locked so that only administrators are able to make changes.

- *Changing Point IV*

In this period, the growth of active users started to have a downward trend, and the viewer numbers increased continuously, so the contribution ratio was on the downside. Two reasons have been given: editors leaving and the boycotts by some countries. First, editor resistance from the Wikipedia community to new content, especially when the edits come from occasional editors, represented a growing contribution inequality as contributions became more biased toward a core of very active editors. In addition, the number of lost editors seems continuously increasing as time goes by. In November 2009, a Ph.D. thesis written by Felipe Ortega, a researcher at the University Rey Juan Carlos in Madrid, found that the English Wikipedia had lost 49,000 editors during the first three months of 2009; in comparison, the project lost only 4,900 editors in 2008.

Meanwhile, several sub-associations under Wikipedia have been established, such as the Wikimedia chapters and local associations of Wikipedia users, which participate in the promotion, development, and funding of the project, and some Wikipedia committees, such as the Arbitration Committee and the Mediation Committee. For example, the role of the Mediation Committee is explicitly to try to resolve disputes, especially those involving content, to the mutual satisfaction of all.

In addition, as the number of articles has increased, there are now materials that some people may find objectionable, offensive, or even pornographic. In 2008, Wikipedia rejected an online petition against the inclusion of depictions of Muhammad in its English edition. The presence of politically sensitive materials in Wikipedia had also led the People's Republic of China to block access to parts of the site. In order to recruit more members and attract more passion, Wikipedia will have to figure out these issues.

Table 4-2 Challenges of Wikipedia's service development

Wikipedia	Stage I: Model establishment	Stage II: Innovation dispersion	Stage III: Community expansion	Stage IV: Service re-invention
Period	2000.03 – 2000.12 (10 months)	2001.01 – 2003.05 (29 months)	2003.06 – 2006.12 (43 months)	2007.01 – Now (38 months)
Challenge	•Poor content •Cold-start problem	•Capital shortage •De-lurking problem	•Content credibility •Copy Right Issue	•Editors turnover •Acquiring new and retain old participants •Blocked by some countries for special event
Revenue source	Financial support from Bomis, Inc.	Financial support from Bomis, Inc.	Donations from Individuals	•Donation and gifts from Individuals, firms and foundations •Business activities

Through the above case analyses, the study found that there are four phases in the life cycle of Web 2.0 service development in both Wikipedia and Facebook. This study further interviewed two industrial experts and proposed the Web 2.0 service development model based on the status of co-creators and viewers of Web 2.0 services, shown in Figure 4-3 and discussed below.

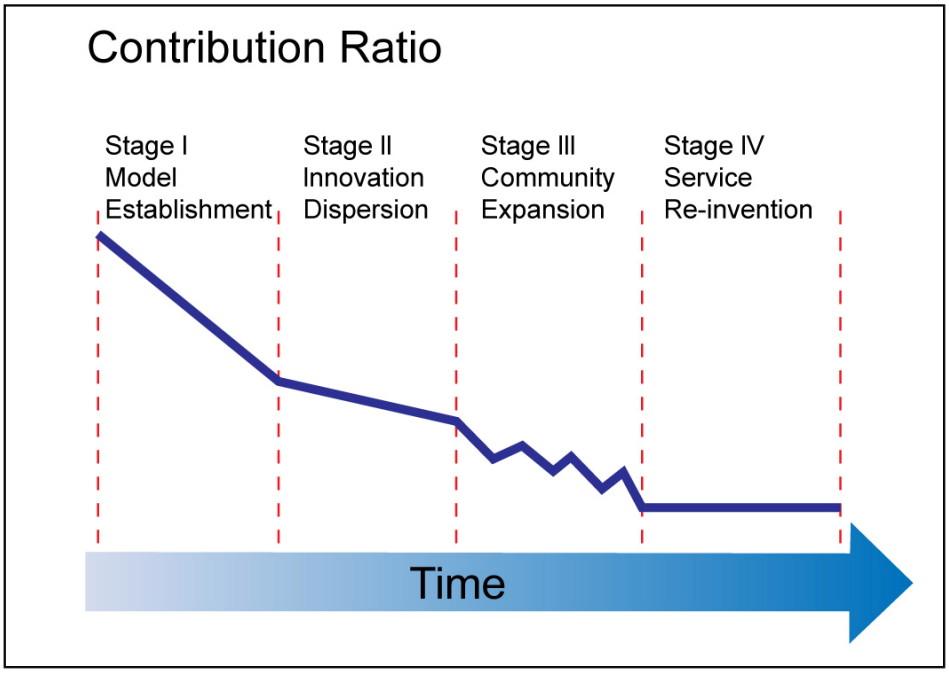


Figure 4-3 Web 2.0 services development model

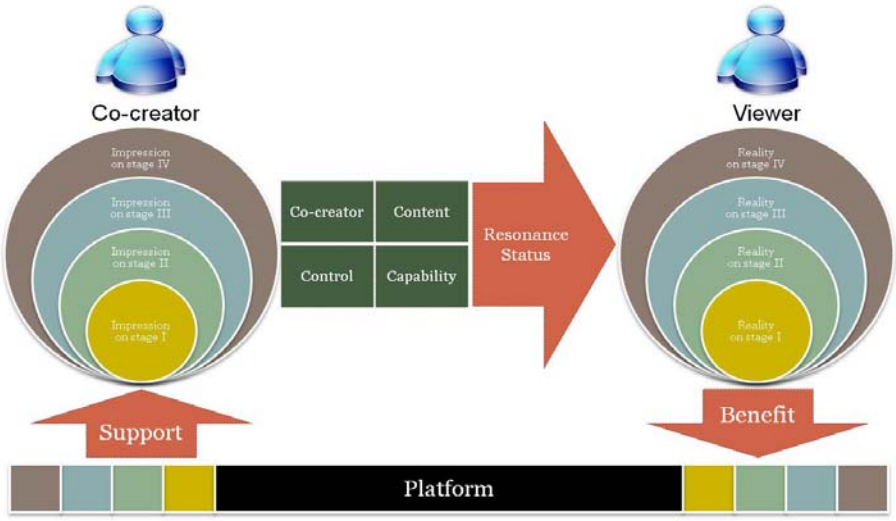
The first phase is named “Model Establishment,” which is focused on discovering the potential needs of the Web 2.0 service co-creators and building the service model to satisfy the needs recognized. In this initial phase, the number of Web 2.0 service co-creators is fewer and increases very slowly so that these sites usually often have to face the challenge of poor content. Thus, the service providers would need to spend more time in encouraging user participation activities for rich content and attracting more viewers.

The second phase is “Innovation Dispersion,” which involves facing a growing need for the services, so that the service provider is adjusting the service features according to participants’ needs. In this development phase, the number of Web 2.0 service co-creators is increasing more quickly than in the previous phase, and the viewers are growing at the same rate. According to the two cases, this phase often faces a capital shortage, which forces the service providers to explore open investment policies in order to build solid and continuously changing services.

The third phase is called “Community Expansion,” whose challenge is to build its community scale through speeding the Web 2.0 service diffusion. The characteristic of this phase is the rapid growth of the service co-creators. However, sites in this phase often have to face many problems derived from deficient control mechanisms. In the two cases studied here, the service providers endeavored to establish appropriate virtual disciplines to provide stable and reliable services.

The fourth phase is “Service Re-invention,” which consists of facing the challenge of continually re-inventing new service value to retain and grow the community. The characteristics of this phase are the stable number of the community scale and the mature service development stage. The sites in this phase often have to face problems about decreasing passion from co-creators. Thus, the service providers need to create new service values or models continuously to generate new and expanded community.

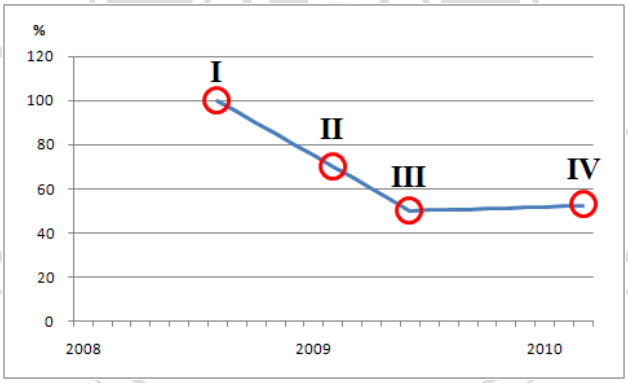
In order to elaborate each phase of Web 2.0 services development process, we conducted a multi-case study. The following are the research results of six cases.



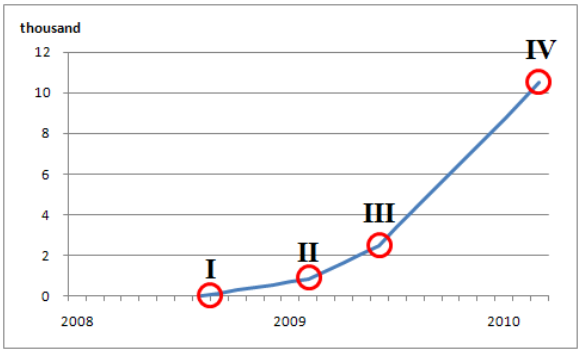
■ **Figure 4-4 IM framework of Web 2.0 services development**

■ PlaySport

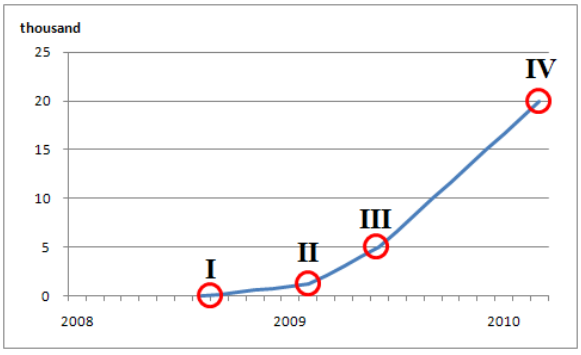
The PlaySport.cc is a specific social network service for the people who simultaneously like sports and lottery. In PlaySport.cc, you can watch the analysis articles written by other PlaySport users. Besides, you can predict the result of a specific sports game or look for others' predictions. There are two types of superstar in PlaySport.cc, one is the super predictor, and the other is the super writer. Each superstar has a lot of fans to support him or her. Everyone can register a PlaySport.cc account to join the PlaySport community. You also can share you happy feelings here and show off the lottery prize when you win the sports lottery. There is a contest hosted by the PlaySport community, by which you can know who is the best predictor in the past month, and every PlaySport member can join the contest for free. If you appreciate one certain predictor due to the precise prediction, you can pay the predictor some virtual currency to buy the complete predictions. Until now, the PlaySport.cc has become the biggest online sporty predictor community in Taiwan. In order to understand the PlaySport service development process, we conducted a face-to-face interview with the CEO of the PlaySport service. The following is a discussion of what the co-creator impression is in each phase of the PlaySport service development process and how it is managed in different phase, as summarized in Tables E.1 and E.2. In addition, we plotted a scatter diagram of PlaySport to portray the patterns of co-creator, viewer, and contribution ratio, all of which are shown in Figure 4-5.



(a) Contribution ratio (Active user / Viewer) pattern



(b) Active user pattern



(c) Viewer pattern

Figure 4-5 Patterns of service contributors, viewers, and contribution ratio on PlaySport

- *Changing Point I*

The stage one of the PlaySport service development process began in August, 2008, when the PlaySport service founder planned to develop his own business. In this stage, the main actor was the service founder, the main audiences were the selected potential clients of the PlaySport.cc, and the perception the founder wished to create for the selected clients was that I can predict the result of a certain sports game. In order to make that impression on the client, the founder spontaneously shared his prediction. And the client could perceive that impression through reading the shared prediction. After accepting that impression, the client might imitate the founder and attempted to become the co-creator of the PlaySport service. If so, the client would register a PlaySport.cc account to login the PlaySport platform to provide his or her prediction. In the resonance process mentioned above, the interaction type between the actor and the audience was person-to-person. And the result of that process was that the more successfully the impression delivered and the more audiences of the prediction were. Besides, the result could be measured by the impression management indexes, including, U.V., P.V., R.M., Total of prediction. To maximize the resonance, the PlaySport service managers attempted to make their efforts in four dimensions, including co-creator, content, control and capability. There was one goal of the co-creator management in this stage, and it was to acquire predictors. In order to acquire predictors, the founder was to be the first predictor, and he also notified his friends to join him. There were four goals of the content management in this stage, and they were to classify sports games, to acquire schedules of sports games, to acquire predictions, and to classify discussions. In classifying sports games, the founder adopted the same taxonomy as that used by Taiwan Sports Lottery. In acquiring schedules, the founder followed the information published by the Taiwan Sports Lottery, and then updated the information manually. In acquiring predictions, the founder predicted in every sports game, and his friends did sometimes. In classifying the discussions, the founder opened sections for each type of the sports games, like baseball, basketball, and so on. There was one goal of the control management in this t stage, and it was to build service image. In order to build service image, the founder created a specific page, About Us, to describe what the PlaySport service was. There were two goals of the capability management in this stage, and they were to build market sensibility and to build platform development ability. In building market sensibility, the founder interviewed the manager of the PTT SportLottery Board. In building platform development ability, the founder started to learn the related knowledge to build the Web application that realized the PlaySport service.

- *Changing Point II*

The stage two of the PlaySport service development process began in February, 2009, when the PlaySport service was launched publicly. In this stage, the main actors were the sporty predictor of the PlaySport service, the main audiences were the public clients of the PlaySport service, and the perception the predictors wished to create for the clients was that I'd like to share my prediction. In order to make that impression on the client, each of the predictor could be tracked by the registered member of the PlaySport service, and the PlaySport predictor would track each other's prediction by marking the predictor as a lamp. Besides, predictors could exchange opinions in the forum. These opinions could be rated or commented to complement the opinion. And the clients could perceive that impression through seeing the interaction outcomes when visiting the PlaySport.cc. After accepting that impression, the client might imitate the predictor and attempted to become the co-creator of the PlaySport service. If so, the client would register a PlaySport.cc account to login the PlaySport platform to interact with the predictors. In the resonance process mentioned above, the interaction type between the actor and the audience was person-to-person. And the result of that process was that the more successfully the impression delivered and the more people who interacted with the predictors. Besides, the result could be measured by the impression management indexes, including, U.V., P.V., R.M., Total of predictions, Total of articles, Total of comments, Total of ratings, Total of lamps, Time on site, and Frequency of repeating visit. To maximize the resonance, the PlaySport service managers attempted to make their efforts in four dimensions, including co-creator, content, control and capability. There were two goals of the co-creator management in this stage, and they were to acquire more predictors, and to enhance the predictor's intrinsic motivation. In acquiring more predictors, the PlaySport recruited an opinion leader from the PTT SportLottery Board. In enhancing the predictor's intrinsic motivation, the PlaySport visualized the predictor's participation by creating various rank lists and by marking them with different badges to reflect their special contributions. There was one goal of the content management in this stage, and it was to enrich the information of sports game. In order to enrich the information of sports games, the PlaySport collected the related game information from the others websites, like MLB.com, and manually updated these data. There was one goal of the control management in this stage, and it was to refine the service image. In order to refine the service image, the PlaySport participated in the Web 2.0 service innovation contest hosted by government. The PlaySport respected to win the contest to get the certification issued by government. If so, the PlaySport could refresh its image from gambling website. The goal of the capability management in this stage was to build capability of reaction to co-creator's feedback. In order to achieve the goal, the PlaySport provided service phone and service email, and also watched the complaints in the forum.

- *Changing Point III*

The stage three of the PlaySport service development process began in June, 2009, when the Predictor of the Month contest was started. In this stage, there were three main actors and they were the super predictor of the PlaySport service, the specific sports game writer group, and the winner group. The super predictor was the PlaySport predictor who won the Predictor of the Month frequently in the PlaySport community. The writer group was composed of the PlaySport members, who frequently posted professional analysis articles in a specific type of sports game board in the forum. The winner group was composed of the PlaySport members, who won the sports-lottery bet over one hundred times. There was one main audience in this stage and they were the internal predictors of the PlaySport. The perception the super predictor wished to create for the internal predictor was that I predicted best. The perception the writer group wished to create for the internal predictor was that we knew how to predict. The perception the winner group wished to create for the internal predictor was that we supported each other. In order to make that impression on the internal predictor, the super predictor frequently predicted in various games and won the contest hosted by the PlaySport. And the internal predictor could perceive that impression through reading the related records in the homepage of the PlaySport or the personal page of the super predictor. After accepting that impression, the predictor might attempt to mark the super predictor as lamp to track his or her prediction, or work hard to defeat the super predictor. In the resonance process mentioned above, the interaction type between the actor and the audience was person-to-person. And the result of that process was that the more successfully the impression delivered and the relative more fans tracked the super predictor. Besides, the result could be measured by the impression management indexes, including, U.V., P.V., Time on site, Frequency of repeating visit. In order to make that impression on the internal predictor, the writer groups were usually interested in specific type of sports game, and they gathered in the PlaySport forum section of that type. These writers frequently posted their analysis articles in detail. These articles were written so professionally and sincerely that they were very convincing. And the predictor could perceive that impression through reading these articles in the PlaySport forum. After accepting that impression, the predictor might rate or comment these articles. And they even posted another article to thank the writers for their contributions. In the resonance process mentioned above, the interaction type between the actor and the audience was group-to-person. And the result of that process was that the more successfully the impression delivered and the relative more writers of the group were or the relative more analysis articles from the writer group were. Besides, the result could be measured by the impression management indexes, including, U.V., P.V., R.M., Time on site, Frequency of repeating visit, and Total of writers. In order to make that impression on the internal predictor, the winner groups would post their extreme winning results of sports lottery in the Winner Of One Hundred Times Over The Bet section, and attached the photo as reference. And the predictor could perceive that impression through reading these records. After accepting that impression, the predictor might congratulate the winners. In the resonance process mentioned

above, the interaction type between the actor and the audience was group-to-person. And the result of that process was that the more successfully the impression delivered and the relative more winners of the group were. Besides, the result could be measured by the impression management indexes, including, U.V., P.V., Time on site, Frequency of repeating visit, and Total of winners. To maximize the resonance, the PlaySport service managers attempted to make their efforts in four dimensions, including co-creator, content, control and capability. There were four goals of the co-creator management in this stage, and they were to acquire more predictors, to filter better predictors, to enhance predictor's emotional relationship with each other, and to protect writers. In acquiring more predictors, the PlaySport expanded the service. Not only the sports games announced by the Taiwan Sport Lottery could be predicted, and there were additional sports game included into the PlaySport prediction service. At the same time, the PlaySport created the official Plurk, Facebook, Twitter, and Pixnet accounts to export its content to attract more predictors. Besides, the PlaySport cooperated with the Union of Kaohsiung Sports Lottory. The PlaySport also produced and published physical newspaper and placed it in the retail stores of the Sports Lottory. In filtering better predictors, the PlaySport hosted the Predictor of the Month contest. In enhancing predictor's emotional relationship with each other, the PlaySport built the special section, Winner Of One Hundred Times Over The Bet. In protecting writers, the PlaySport regulated the community order and avoid the abuse when the result of the sports game didn't conform to the writer's analysis. There were seven goals of the content management in this stage, and they were to enrich service information, to acquire high-quality predictions, to produce high-quality analysis articles, to reorganize forum articles, to deny inappropriate forum articles, to improve content's accessibility, and to improve content's readability. In enriching service information, the PlaySport expanded the service. It added more extra sports game information and also added a special section for the retail stores of the sports lottory. In acquiring high-quality analysis articles, the PlaySport recruited writers to produce in-house newspaper. In reorganizing forum articles, the PlaySport recruited three volunteer community coordinators. In acquiring high-quality predictions, the PlaySport hosted the Predictor of the Month contest and hoped that the monetary award could encourage the predictor contribute better predictions. The PlaySport also adjusted the rule of the feature, Main Prediction, to encourage the predictor contribute more precise predictions. In denying inappropriate forum articles, the PlaySport developed a new program to automatically detect the illegal content and avoid it to appear in the forum. In improving content's accessibility, the PlaySport released a new search feature to quickly find the predictor, the article and the prediction by various criteria. In improving content's readability, the PlaySport re-organized knowledge and activity by different categories to separate the sporty lottery game information and non-lottery game information. There were three goals of the control management in this stage, and they were to refine service image, to enhance service security, and to enhance service efficiency. In refining service image, the PlaySport changed its service logo and slogan in the homepage to emphasize its community concept. In enhancing service security, the PlaySport outsourced its operation to an U.S. virtual host service

to defense against hacker attacks. In enhancing service efficiency, the PlaySport developed a new program to streamline its process through updating its game information automatically instead of the original manual operation. There were three goals of the capability management in this stage, and they were to build capability of marketing, to build capability of profit earning, and to build capability of online sporty predictor community management. In building the capability of profit earning, the PlaySport tried to sell the notification service to its users via mobile phone's SMS.

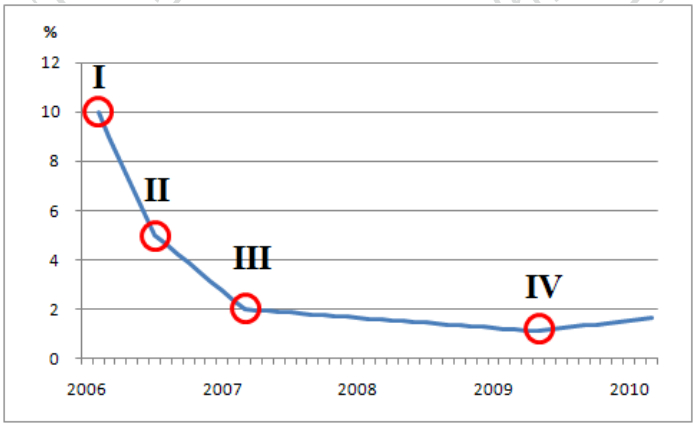
- *Changing Point IV*

The stage four of the PlaySport service development process began in March, 2010, when the PlaySport Prediction Trading service was launched. There were two main actors in this stage, and they were the group of super predictors and the whole PlaySport community. There were also two main audiences in this stage and they were the whole PlaySport community and the business partners, including newspaper companies and Taipei Fubon. The perception the group of super predictors wished to create for the whole PlaySport community was that we predicted best. The perception the whole PlaySport community wished to create for the business partners was that we were the best in sporty gambling market. In order to make that impression on the whole PlaySport community, the group of super predictors had its own section, in which there was group information, including super predictor list and the history prediction record of each super predictor. And the audiences could perceive that impression through visiting the group section. After accepting that impression, the member of the PlaySport community might attempt to buy their complete predictions. In the resonance process mentioned above, the interaction type between the actor and the audience was group-to-group. And the result of that process was that the more successfully the impression delivered and the more prediction trades were. Besides, the result could be measured by the impression management indexes, including P.M, Total of trades, and Revenue. In order to make that impression on the business partners, the whole PlaySport community gathered a mass sporty group, who also would like to buy sports lottery, and continuously exported high-quality sporty content. And the audiences could perceive that impression through reading the exported content and the community information in various mass media. After accepting that impression, the newspaper company might attempt to cooperate with the PlaySport and outsourced their sports lottery section to the PlaySport, by which the newspaper company and the PlaySport could exchange and share the content and the member resources. In the resonance process mentioned above, the interaction type between the actor and the audience was group-to-group. And the result of that process was that the more successfully the impression delivered and the more influence of the PlaySport community was. Besides, the result could be measured by the impression management indexes, Total of business partners. To maximize the resonance, the PlaySport service managers attempted to make their efforts in four dimensions,

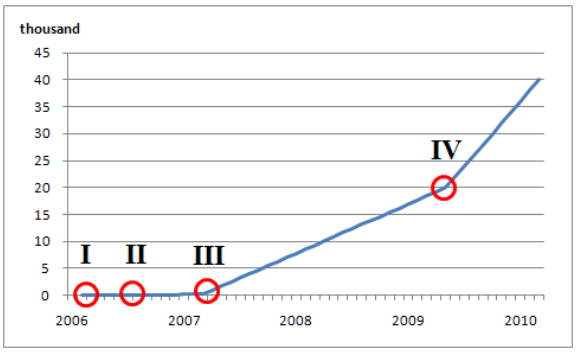
including co-creator, content, control and capability. The goal of the co-creator management in this stage was to retain the current super predictors. In order to achieve the goal, the PlaySport re-invent its service to provide C2C prediction trading service, by which the super predictor could sell his or her prediction to other predictors. The goal of the content management in this stage was to improve service accessibility. In order to achieve the goal, the PlaySport established a new section to promote the group of super predictors. The goal of the control management in this stage was to improve service efficiency. In order to achieve the goal, the PlaySport cooperated with the ibon service to provide more convenient payment to complement its trading service. The goal of the capability management in this stage was to build the re-invention capability. In building re-invention capability, the PlaySport developed a new virtual currency to be used in the C2C prediction trading service.

■ iPeen

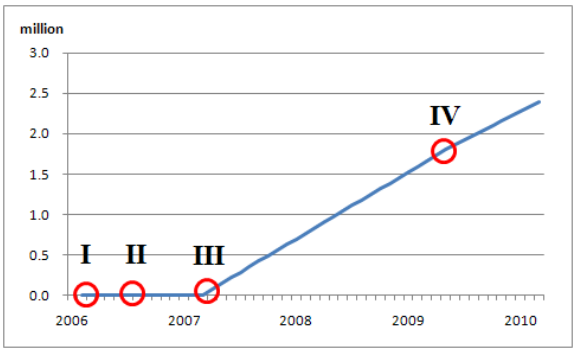
The iPeen.com is a specific social network service for the people who want to share their experience of consumption. All of the consumption information in the iPeen service is generated by its users. Everyone can register an account to join the iPeen community and then becomes one of the iPeeners, who are the iPeen users with their own iPeen accounts. Each iPeener has his or her own personal page, in which other iPeeners can see his or her activity summary and use that to evaluate the reliability of his or her opinions. An iPeener can create the basic information of a store or a product, or complement the information created by other iPeeners. Besides, an iPeener can provide his or her opinions about a store or a product according to the personal experience of consumption. In addition, an iPeener can find the people who have the same interest of consumption with himself or herself. Those people who have the same interest of consumption can register a group account and they can exchange information in their group section. The iPeen.com develops a virtual currency named P coin and uses it to reward iPeeners their contributions. The iPeen.com also uses the P coin to punish iPeeners for their inappropriate behaviors. An iPeen can exchange his or her P coin for various coupons. Those coupons are provided by different stores. The iPeen somehow is like the client service department of its business partners, the stores. The iPeen is devoted to create the triple-win service for the iPeeners, the stores and itself. Until now, the iPeen.com has become the biggest online diet consumer community in Taiwan. In order to understand the iPeen service development process, we conducted a face-to-face interview with the CEO of the iPeen service. The following is a discussion of what the co-creator impression is in each phase of the iPeen service development process and how it is managed in different phase, as summarized in Tables C-1 and C-2. In addition, we plotted a scatter diagram of iPeen to portray the patterns of co-creator, viewer, and contribution ratio, all of which are shown in Figure 4-6.



(a) Contribution ratio (Active user / Viewer) pattern



(b) Active user pattern



(c) Viewer pattern

Figure 4-6 Patterns of service contributors, viewers, and contribution ratio on iPeen

- *Changing Point I*

The stage one of the iPeen service development process began in February, 2006, when the iPeen Company was co-founded by the current CEO of the iPeen.com and his three friends. In this stage, the main actor were the service founders, the main audiences were the selected potential clients of the iPeen.com, and the perception the founder wished to create for the selected clients was that I have a dining experience to share. In order to make that impression on the client, the founder spontaneously shared his experience. And the client could perceive that impression through reading the shared experience. After accepting that impression, the client might imitate the founder and attempted to become the co-creator of the iPeen service. If so, the client would register an iPeen.com account to login the iPeen platform to provide his or her experience. In the resonance process mentioned above, the interaction type between the actor and the audience was person-to-person. And the result of that process was that the more successfully the impression delivered and the more audiences of my experience were. Besides, the result could be measured by the impression management indexes, including, U.V., P.V., R.M., Total of experience. To maximize the resonance, the iPeen service managers attempted to make their efforts in four dimensions, including co-creator, content, control and capability. There was one goal of the co-creator management in this stage, and it was to acquire amateur gourmet. In order to acquire amateur gourmets, the founders were to be the first amateur gourmets, and they also notified their friends to join them. There were two goals of the content management in this stage, and they were to classify foods, to acquire dining experiences. In classifying foods, the founders decided to adopt the tag taxonomy and permit the iPeeners, the iPeen users, to define what type the food in their dining experiences was. In acquiring dining experiences, the founders posted their personal experience every day and convince their friends to do so. There was one goal of the control management in this t stage, and it was to build service image. In order to build service image, the founders created a specific page, About Us, to describe what the iPeen service was. There were two goals of the capability management in this stage, and they were to build market sensibility and to build platform

development ability. In building market sensibility, the founder conducted a multi-case study to understand the online amateur gourmet market, and hoped to find out what insufficiency were in the current services. In building platform development ability, the founders started to learn the related knowledge to build the Web application that realized the iPeen service. Some were responsible to learn the user interface technologies like HTML and CSS. And some were responsible to learn the database system programming.

- *Changing Point II*

The stage two of the iPeen service development process began in July, 2006, when the iPeen service was launched publicly. In this stage, the main actors were the amateur gourmet of the iPeen service, the main audiences were the public clients of the iPeen service, and the perception the gourmet s wished to create for the clients was that I'd like to know more about others' experience. In order to make that impression on the client, each of the dining experience could be rated or commented, and the store talked in the experience could be added more information to complement. Besides the gourmet could be marked as friend and after that the friend could communicate to each other through the intra communication tool. And the clients could perceive that impression through seeing the interaction outcomes when visiting the iPeen.com. After accepting that impression, the client might imitate the gourmet and attempted to become the co-creator of the iPeen service. If so, the client would register an iPeen.com account to login the iPeen platform to interact with the gourmet. In the resonance process mentioned above, the interaction type between the actor and the audience was person-to-person. And the result of that process was that the more successfully the impression delivered and the more people who interacted with the gourmet. Besides, the result could be measured by the impression management indexes, including, U.V., P.V., R.M., Total of experience, Total of comments, Total of ratings, Total of friendship, Time on site, and Frequency of repeating visit. To maximize the resonance, the IPeen service managers attempted to make their efforts in three dimensions, including co-creator, content, and capability. There were four goals of the co-creator management in this stage, and they were to acquire more gourmets, to acquire better gourmet, to evaluate gourmet's contribution, and to enhance gourmet's emotional relationship with the iPeen. In acquiring more gourmets, the iPeen released a feature named Referral Helper, by which the iPeeners could easily to notify their friends to join into the iPeen community via email. In acquiring better gourmets, the service founders collected a blogger list of the external famous amateur gourmets, and then left their dining experiences on the blogs carefully. The founders attempted to make friendship with those bloggers. When the blogger started to react to these messages the founders tried to ask the blogger to visit the iPeen.com. In evaluating the gourmet's contribution, the iPeen developed a virtual currency system. In enhancing gourmet's emotional relationship with the iPeen, the founder used the intra communication tool to frequently talk to the iPeen gourmets. There was one goal of the content management in this stage, and it was to improve content's reliability. In order to improve content's reliability, the iPeen developed a

rating system, by which the iPeen gourmets could rate others' experience. The goal of the capability management in this stage was to build capability of reaction to gourmet's feedback. In order to achieve the goal, the iPeen opened several sections in the iPeen Help Help forums. Besides, the iPeen managers quickly and kindly reacted to every question in the forum. They worked hard to create a warm environment for the iPeen gourmets.

- *Changing Point III*

The stage three of the iPeen service development process began in March, 2007, when the Gourmet Group feature was released. In this stage, there were two main actors and they were the super gourmet of the iPeen service, and the specific-field gourmet group. The super gourmet was the iPeen gourmet whose experiences were rated as very useful. The specific-group was composed of the iPeen gourmets, who were interested in the same field. The perception the super gourmet wished to create for the internal gourmet was that I knew how to evaluate the diet. The perception the gourmet group wished to create for the internal gourmet was that we were a group of interested in the same field. In order to make that impression on the internal gourmet, the super gourmet frequently contributed personal dining experiences and won the others' appreciations. And the internal gourmet could perceive that impression through reading the related records in each of the experiences provided by the super gourmet or the personal page of the super gourmet. After accepting that impression, the gourmet might attempt to add the super gourmet as friend to track his or her articles. In the resonance process mentioned above, the interaction type between the actor and the audience was person-to-person. And the result of that process was that the more successfully the impression delivered and the relative more influence of the super gourmet was. Besides, the result could be measured by the impression management indexes, including, U.V., P.V., Time on site, Frequency of repeating visit. In order to make that impression on the internal gourmet, the gourmet group had its own independent section, in which there was group information, including group name, group description, group regulations, a list of group members, and a list of articles provided by its members. Besides, there was a specific forum belonged to the group and the group members could exchange information here. And the gourmet could perceive that impression through visiting the group section. After accepting that impression, the gourmet might join into the group or might initiate another new group. In the resonance process mentioned above, the interaction type between the actor and the audience was group-to-person. And the result of that process was that the more successfully the impression delivered and the relative more gourmets of the group were or the relative more dining articles from the gourmet group were. Besides, the result could be measured by the impression management indexes, including, U.V., P.V., R.M., Time on site, Frequency of repeating visit, R.G., Total of members per group, and Total of articles per group. To maximize the resonance, the iPeen service managers attempted to make their efforts in four dimensions, including co-creator, content, control and capability. There were three goals of the co-creator management in this stage, and they were to acquire more gourmets, to acquire better

gourmets, and to enhance gourmet's emotional relationship with the iPeen. In acquiring more gourmets, the iPeen paid much a lot of efforts to do search engine optimization (for short SEO). Besides, the iPeen released the Gourmet Group feature to allow its iPeeners to establish their social network. In acquiring better gourmets, the iPeen deeply cooperated with the Google Map. In enhancing gourmet's emotional relationship with the iPeen, the iPeen hosted a physical gathering, and regulate the online community order carefully. There were four goals of the content management in this stage, and they were to acquire more experiences, to improve content's reliability, to improve content's readability, and to improve content's accessibility. In acquiring more experiences, the iPeen attempted to cooperate with some stores to do joint campaign. In improving content's reliability, the iPeen enhanced its original rating system and expanded it to include more rating opinions of different types. In improving content's readability, the iPeen used the Google Map technology to visualize its content. In improving content's accessibility, the iPeen adopted the QR Code technology to reuse its content. There were three goals of the control management in this stage, and they were to improve service stability, to build trusted environment, and to retain service image. In improving service stability, the iPeen upgraded its IT infrastructures to overcome the overloading problem. In building a trusted environment, the iPeen authenticated the iPeeners via mobile. In retaining service image, the iPeen closely cooperated with the external stores to deal with the iPeener's inappropriate behavior in the store. There was one goal of the capability management in this stage, and it was to build capability of online amateur gourmet community management.

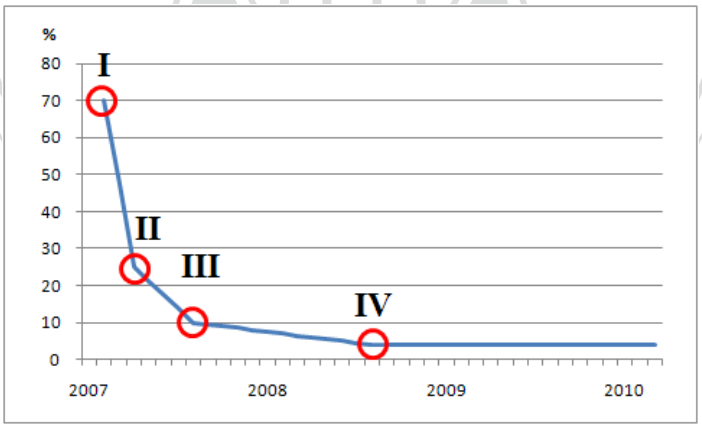
- *Changing Point IV*

The stage four of the iPeen service development process began in March, 2009, when the iPeen service transformed from "dining experience sharing service" into "life experience sharing service". There was one main actor in this stage, and it was the whole iPeen community. There was also one main audience in this stage and it was the business partners, including the content importers and consuming products or services providers. The perception the whole iPeen community wished to create for the business partners was that we were the best in living. In order to make that impression on the business partners, the whole iPeen community gathered a mass of consumers and continuously exported high-quality consuming experience. And the audiences could perceive that impression through reading the exported content and the community information in various mass media. After accepting that impression, the content importers might attempt to cooperate with the iPeen and imported the iPeen content, by which the importers and the iPeen could exchange and share the content and the member resources. And the consuming products or services providers might attempt to cooperate with the iPeen and provided their product or service to the iPeen community, by which the providers could share the iPeen member resource. In the resonance process mentioned above, the interaction type between the actor and the audience was group-to-group. And the result of that process was that the more successfully the impression

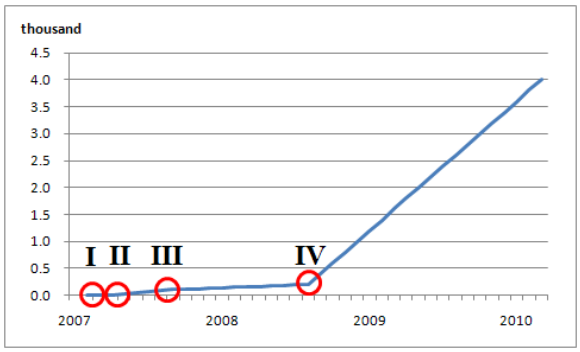
delivered and the relative more influence the whole iPeen community was. Besides, the result could be measured by the impression management indexes, including, U.V., P.V., and Total of business partners. To maximize the resonance, the iPeen service managers attempted to make their efforts in four dimensions, including co-creator, content, control and capability. There were two main goals of the co-creator management in this stage, and they were to acquire more consumers and to retain current writers. In acquiring more consumers, the iPeen started broadly business alliance. The alliance included Nokia, Hang.la, ezTable, Business Week Magazine, Apple app store and so on through exporting its content. Besides, the iPeen started pay effort to mass media promotion, including TV, newspaper, and online portals. And the iPeen also created official Plurk and Facebook account to try to get more consumers from other online community. In retaining current writers, the iPeen reinvent its service to include more types consuming experiences. There were three main goals of the content management in this stage, and they were to acquire more articles, to improve content's accessibility, and to reuse current content. In acquiring more articles, the iPeen conducted a serial of joint campaigns with its business partners to create writing subject for the iPeeners. In improving content's accessibility, the iPeen released a new search feature and a new service navigation tool to easily access the specific service the iPeeners needed. In reusing the current content, the iPeen selected different contents to export to different platforms. There were two main goals of the control management in this stage, and they were to improve service stability and to enhance service privacy. In improving service stability, the iPeen upgraded the system infrastructure again to overcome the overloading problem. In enhancing service privacy, the iPeee made balance between convenient-oriented feature and privacy exposure. There were four main goals of the capability management in this stage, and they were to build capability of project management, to build capability of marketing, to build re-invention capability to transform original diet-related social network service to consumption-related social network service, and to build capability of profit earning.

■ AnswerBox

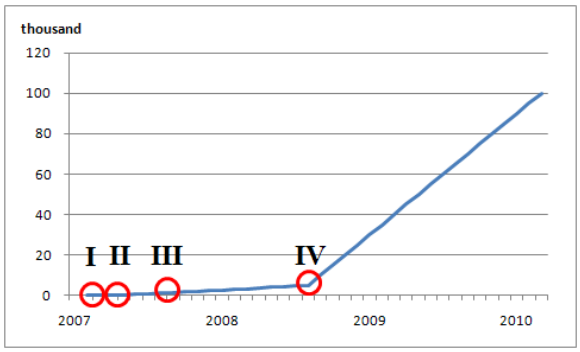
The AnswerBox.net is a location-based social network service, which combines the online map service and the blog service. The AnswerBox.net is devoted to create a warm virtual community and implements this concept in detail. Everyone can register an AnswerBox.net account to join the community. Each member of the AnswerBox.net has a personal section, in which there are features, including Diary, Photo, Message Board, Gift Box, Friend List, Interest Group, Favorite, Route and Point of Spot. Besides, there are many games and all of them are small and funny. The AnswerBox.net member can interact with other users through those games. In addition to small game, there are also bigger community games and they are usually hosted in the form of joint marketing campaign with other business partners. Sometimes, you can gain some prizes when participating in those bigger games. The main feature of the AnswerBox.net is its map service, with which the information on the AnswerBox.net platform can be linked to a location. The AnserBox.net has its virtual currency, Cool Coin. You can earn Cool Coin by writing a diary, uploading a photo, logging every day, inviting a friend to join the AnswerBox.net, take caring of the new AnswerBox.net member, leaving a message to other AnswerBox.net members, or buying. And you can use Cool Coin to broadcast a message to the whole community, to but a virtual gift, to conduct a public poll, to conduct a public talk, to adopt a virtual pet, to play a small game, and so on. In February, 2008, the AnswerBox.net won the first place of the Demo Show Conference. Until now, the AnswerBox.net has become the biggest online location-based social network community in Taiwan. In order to understand the AnswerBox.net service development process, we conducted a face-to-face interview with the CEO of the AnswerBox.net service. The following is a discussion of what the co-creator impression is in each phase of the AnswerBox.net service development process and how it is managed in different phase, as summarized in Tables A-1 and A-2. In addition, we plotted a scatter diagram of AnswerBox.net to portray the patterns of co-creator, viewer, and contribution ratio, all of which are shown in Figure 4-7



(a) Contribution ratio (Active user / Viewer) pattern



(b) Active user pattern



(c) Viewer pattern

Figure 4-7 Patterns of service contributors, viewers, and contribution ratio on AnswerBox

- *Changing Point I*

In February, 2007, the AnswerBox Company was co-founded by Andy (current CTO) and his senior brother Jeff (current CEO). In this stage, the main actors were the two internal founders of the Answerbox Company, the main audience was the potential clients of the Answerbox service and the actor attempted to make the impression that I had a personal diary to share with the world on the audience. In order to make the impression, the actor shared his or her diary via the Answerbox service and the audience might be resonated by reading the shared diary on the Answerbox platform. The resonance status could be reflected by indices, including unique visitor (for short, U.V.), page view (for short P.V.), registered member (for short R.M.) and amount of content. When the audience realized the impression via reading the diary he or she might imitate the actor and then registered as the member of the Answerbox service to provide his or her personal diary. Hence the more resonance was and the higher either U.V, P.V., R.M. or amount of content was. In order to make the resonance well, the Answerbox founders conducted a research to understand the market of the social network service. After the market research work done, Andy started to build the Web application that realized the Answerbox service. In order to make the Answerbox service easy to use, Jeff conducted another research to gather the information about the common Internet user's computing skill and motivation and then transformed this information into IT specifications for Andy as a reference when building the Web application. After the Web application done, the Answerbox founders registered as the first users. And then they published several personal diaries and also created an About Us page to tell the audience what the Answerbox service is.

- *Changing Point II*

On April 10, 2007, the AnswerBox service was public launched, the average of daily active user in the month was five persons and the average of daily viewer in the month was twenty persons. The main actor in this stage was the member of AnswerBox.net and the main audience was the public client of AnswerBox.net. The perception the member of AnswerBox.net wished to create for the public client of AnswerBox.net was that I liked to share with you. To maximize the resonance, the AnswerBox service managers attempted to make their efforts in two dimensions, including co-creator and capability. In order to acquire more users, the AnswerBox adopted the Yahoo web service to allow the users who have Yahoos accounts to user the AnswerBox service directly without registration. Besides, the AnswerBox released a new feature, Invite, to assist the current AnswerBox users to invite their friends to join the AnswerBox community. At opening night, the AnswerBox hosted a big online party to celebrate its opening, and created a news subject for the mass media. That also attracted a lot of clients to join the community. In order to enhance the user's emotional relationship with the AnswerBox service, the AnswerBox would automatically add the founder's account as friend when you first login to the community, and you would see the welcome message from the founder in your personal page. In order to announce the latest service status and collect the feedbacks from the service users, the AnswerBox used the service itself to create an account named Servant and the Servant was responsible to communicate with AnswerBox users.

- *Changing Point III*

On August 30 2007, the diversity of user types appeared, the average of daily active user in the month was one hundred persons and the average of daily viewer in the month was one thousand persons. The main actor in this stage was the specific subject group and the main audience was the member of AnswerBox.net. The perception the specific subject group wished to create for the member of AnswerBox.net was that we're the group sharing the same interests. To maximize the resonance, the AnswerBox service managers attempted to make their efforts in four dimensions, including co-creator, content, control and capability. When the users were more and more, the diversity among users revealed. In order to acquire more users, the AnswerBox attempted to assist is members to organize the group they needed. And through the group establishment, the group would bring more users in. In order to retain the current users, the AnswerBox endeavored to develop a serial of games to make the community environment more entertaining. In order to acquire more content, the AnswerBox released a new feature, Route. The route was composed of a serial of points, and each point could link to a diary. It gave the AnswerBox user a direction to write more diaries for completing a route. In order to enhance the professional service image, the AnswerBox participated in the 2008 Demo Show Conference to prove its creativity and potential business benefits. In order to overcome the overloading problem, the AnswerBox upgraded its

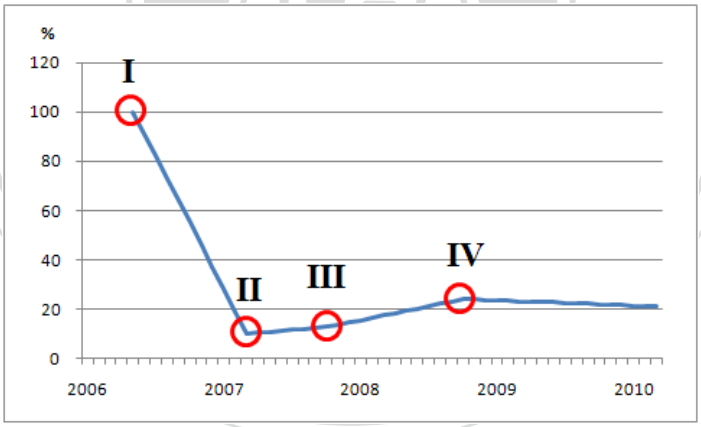
system infrastructure from one server to multi –servers, and that made the service more stable. The AnswerBox closely cooperated with the police to deal with the illegal behavior in the community, and developed a standard of procedure to handle that situation.

- *Changing Point IV*

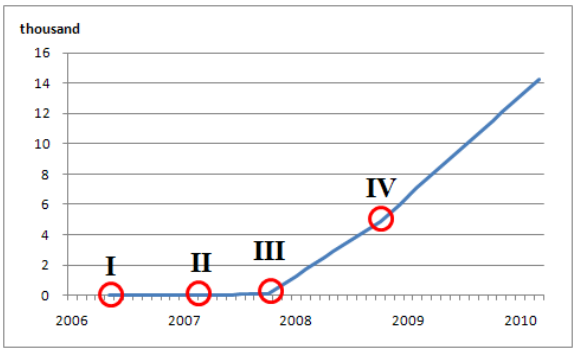
On August 25 2008, the “hot talks” feature was released, the average of daily active user in the month was two hundred persons and the average of daily viewer in the month was five thousand persons. The main actor in this stage was the whole AnswerBox.net community and the main audience was the business partners. The perception the whole AnswerBox.net community wished to create for the business partners was that we’re the major one social network community in Taiwan. To maximize the resonance, the AnswerBox service managers attempted to make their efforts in four dimensions, including co-creator, content, control and capability. In order to acquire more users, the AnswerBox continuously provided the mass media the community campaign story. In order to retain the current AnswerBox.net members, the AnswerBox.net released a new feature, Hot Talks, to create a serial of discussion subjects for its members. The subject could be initiated by any AnswerBox.net member, and could be discussed publicly. Besides, the AnswerBox released another feature, Poke Poke Game. In order to classify the subjects in Hot Talks, the AnswerBox adopted a static taxonomy. First, the AnswerBox exploited its database to find out the more frequently mentioned subjects in the past diaries posted by its members. According to this information, the AnswerBox define several types of subject for the Hot Talks. In order to acquire more diaries, the AnswerBox released a new feature, Poke Poke Game, to add some entertaining element to diary writing. When the AnswerBox member contributed a diary, the AnswerBox would award the member a chance to poke the game board. After poking, there appealed a hole on the screen, and there was a prize in the hole. Besides, the AnswerBox used a lot of pop up message to guide its member to easily provide content, including sending a virtual gift or leaving a message to someone. In order to enhance the professional service image, the AnswerBox released the mobile service to demonstrate its R&D capability. Over forty percent of the AnswerBox.net members had Facebook account, and that enabled the AnswerBox.net to develop its capability of profit earning. The main business model of the AnswerBox was to assist its business partners to do online marketing, especially in the social network, including in AnswerBox.net itself and in Facebook.com. The AnswerBox also received samples from the product providers, and these samples would be dispatched to the AnswerBox users. After using the samples, the AnswerBox users needed to posted their opinions.

■ ihergo

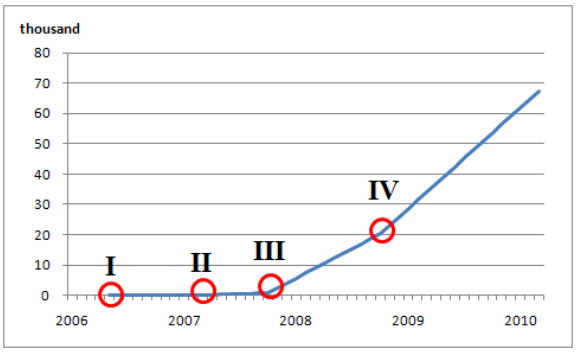
The ihergo.com.com is the online group-buying utility. In the ihergo.com community, there are two types of players in a group-buying activity, one is the activity initiator and the other is the activity follower. Everyone can register an account to join the ihergo.com community. After completing the registration, users can either join the public group-buying activities or initiate a new group-buying activity to be followed by other users. Besides, users can create the basic information of a store or a product, or complement the information created by other ihergo.com users, and that information can be reused in the future group-buying activity. Each ihergo.com user has a personal page, in which there are evaluations made by other ihergo.com users. Only the ihergo.com users in the same group-buying activity can evaluate their activity members. Until now, the ihergo.com.com has become the biggest online group-buying consumer community in Taiwan. In order to understand the ihergo.com service development process, we conducted an email interview with the CEO of the ihergo.com service. The following is a discussion of what the co-creator impression is in each phase of the ihergo.com service development process and how it is managed in different phase, as summarized in Tables B-1 and B-2. In addition, we plotted a scatter diagram of ihergo.com to portray the patterns of co-creator, viewer, and contribution ratio, all of which are shown in Figure 4-8.



(a) Contribution ratio (Active user / Viewer) pattern



(b) Active user pattern



(c) Viewer pattern

Figure 4-8 Patterns of service contributors, viewers, and contribution ratio on ihergo.com

- *Changing Point I*

In mid May, 2006, ihergo.com Company was co-founded by two ex-IBM engineers. In this stage, the main actors were the internal two founders of the Ihergo.com Company, the main audience was the potential clients of the Ihergo.com service and the actor attempted to make the impression that I had a group-buying product to share with the world on the audience. In order to make the impression, the actor shared his or her product via the Ihergo.com service and the audience might be resonated by reading the shared product on the Ihergo.com platform. The resonance status could be reflected by indices, including unique visitor (for short, U.V.), page view (for short P.V.), registered member (for short R.M.) and amount of content. When the audience realized the impression via reading the group-buying product he or she might imitate the actor and then registered as the member of the Ihergo.com service to provide his or her group-buying product. Hence the more resonance was and the higher either U.V, P.V., R.M. or amount of content was. In order to make the resonance well, the Ihergo.com founders conducted a research to understand the service market of the community composed of the group-buying consumers. After the market research work done, the Ihergo.com founders started an IT study for learning technical knowledge to build the Web application that realized the Ihergo.com service. In order to make the Ihergo.com service easy to use, the Ihergo.com founders conducted another research to gather the information about the group-buying consumer's computing skill and motivation and then transformed this information into IT specifications as a reference when building the Web application. After the Web application done, the Ihergo.com founders registered as the first group-buying consumers. And then they published several group-buying products and also created an About Us page to tell the audience what the Ihergo.com service is.

- *Changing Point II*

In March, 2007, the Ihergo.com service was launched, the average of daily active user in the month was ten persons and the average of daily viewer in the month was one thousand persons. The main actor in this stage was the group-buying initiator of ihergo.com and the main audience was the public client of ihergo.com. The perception the group-buying initiator of ihergo.com wished to create for the public client of ihergo.com was that we should buy together. To maximize the resonance, the ihergo.com service managers attempted to make their efforts in four dimensions, including co-creator, content, control and capability. There were two main goals of the co-creator management in this stage, and there were to acquire more group-buying initiators and to acquire group-buying buyer. There were two main goals of content management in this stage, and there were to acquire product information and to classify product information. There was one main goal of control management in this stage, and it was to refine service image. There was one main goal of capability management in this stage, and it was to build reaction capability.

- *Changing Point III*

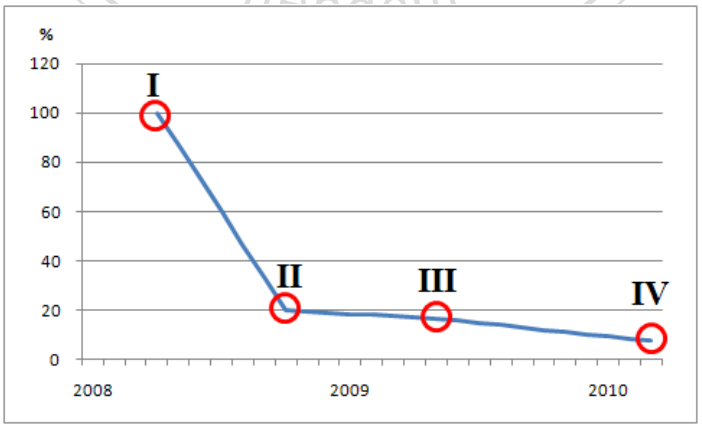
In October, 2007, the "family" feature was released, the average of daily active user in the month was one hundred and nine persons and the average of daily viewer in the month was eight hundred and fifty two persons. The main actor in this stage was the specific-type group-buying family of ihergo.com and the main audience was member of ihergo.com. The perception the specific-type group-buying family of ihergo.com wished to create for the member of ihergo.com was that we buy together frequently and we were good at buying. To maximize the resonance, the ihergo.com service managers attempted to make their efforts in four dimensions, including co-creator, content, control and capability. There were four main goals of the co-creator management in this stage, and there were to acquire more group-buying buyers, to acquire group-buying group, to enhance group's function, and to increase co-creator's representation ability. There were four main goals of content management in this stage, and there were to organize product information, to evaluate content, to re-classify product information, and to re-organize product information. There were three main goal of control management in this stage, and they were to refine service image, to improve service stability, and to improve service efficiency. There was one main goal of capability management in this stage, and it was to build online community management capability.

- *Changing Point IV*

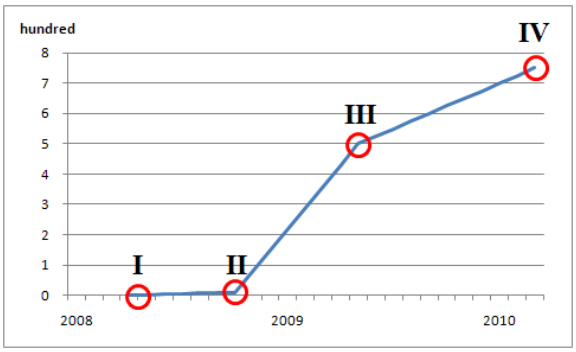
In October, 2008, the “online mall” service was started, the average of daily active user in the month was four thousand and eight hundred and ninety three persons and the average of daily viewer in the month was twenty thousand and two hundred and ninety five persons. The main actor in this stage was the whole ihergo.com community and the main audience was the external business partners. The perception the whole ihergo.com community wished to create for its external business partners was that we were the best in the group-buying market. To maximize the resonance, the ihergo.com service managers attempted to make their efforts in three dimensions, including co-creator, content, and capability. There was one main goal of the co-creator management in this stage, and it was to acquire group-buying group. There were three main goals of content management in this stage, and there were to reuse product information, to classify stores, and to improve store’s accessibility. There was one main goal of capability management in this stage, and it was to build re-invention capability to create online shopping mall platform.

■ MyGo

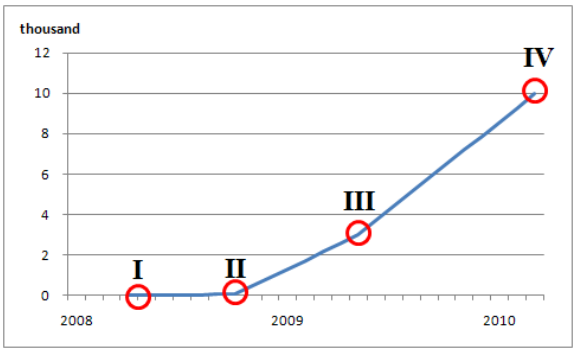
The MyGo.com is a specific social network service for the real estate agents and it is dedicated to create a brand new channel in which the major players in a real estate transaction can establish their friendship with each other in the same time when they use the MyGo.com to complement the business. There are various roles in the MyGo community, including the real estate agents, the real property providers who want to sell or lease, the real property consumers who want to buy or rent, the real estate constructors and so on. Everyone can register a role to join the MyGo community. After completing the registration, users have their own blogs with which they can introduce themselves, publish the real property object information, including profiles, maps, photos and videos, and organize the real estate articles. Additionally, users can configure the preference settings for their real estate needs, and according to the configuration, the service will automatically match users in the background. Once there is a user qualified to fulfill your real estate needs, the service will notify you in the way you determined in advance. The MyGo.com allows the real estate agents to manifest their personal images, and that is not encouraged in the traditional real estate agencies. A traditional real estate agency emphasizes the agency brand not the agent brand. The MyGo.com assists the real estate agents to create their brands and it is free of charge to use those basic services. For premium users, the MyGo.com provide them various selling kits and marketing tools and those are not free. Until now, the MyGo.com has become the biggest online real estate commercial community in Taiwan and there are over 6,000 real estate agents and over 47,443 real properties on the platform. In order to understand the MyGo service development process, we conducted a face-to-face interview with the CEO of the MyGo service. The following is a discussion of what the co-creator impression is in each phase of the MyGo service development process and how it is managed in different phase, as summarized in Tables D-1 and D-2. In addition, we plotted a scatter diagram of MyGo to portray the patterns of co-creator, viewer, and contribution ratio, all of which are shown in Figure 4-9.



(a) Contribution ratio (Active user / Viewer) pattern



(b) Active user pattern



(c) Viewer pattern

Figure 4-9 Patterns of service contributors, viewers, and contribution ratio on MyGo

➢ *Changing Point I*

The stage one of the MyGo service development process began in April, 2008, when the MyGo Company was founded by the current CEO of the MyGo.com. In this stage, the main actor was the company founder, the main audiences were the selected potential clients of the MyGo.com, and the perception the CEO wished to create for the selected clients was that I had a real property to share, either for lease or sale, meanwhile I also had a real property needs, either for rent or for buy. In order to make that impression on the client, the founder spontaneously shared the real property he owned and the requirement specification of the real property he needed. And the client could perceive that impression through reading the shared real property and the shared requirement specification of the real property. After accepting that impression, the client might imitate the founder and attempted to become the co-creator of the MyGo service. If so, the client would register a MyGo.com account to login the MyGo platform to provide the real property which he or she wanted to lease or sell, or to provide the requirement specification of the real property which he or she wanted to rent or buy. In the resonance process mentioned above, the interaction type between the actor and the audience was person-to-person. And the result of that process was that the more successfully the impression delivered and the more audiences of the real property or the needs specification of the real property were. Besides, the result could be measured by the impression management indexes, including, U.V., P.V., R.M., Total of real property, and Total of needs specification of real property. To maximize the resonance, the MyGo service managers attempted to make their efforts in four dimensions, including co-creator, content, control and capability. There were three goals of the co-creator management in this stage, and they were to acquire buy-side clients and to acquire sell-side clients. In order to acquire buy-side clients, all the employees of the MyGo Company were asked to be the buy-side clients of the MyGo service. In order to acquire sell-side clients, all the employees of the MyGo Company were also asked to be the sell-side clients of the MyGo service. In order to acquire real estate agents, the founder visited his friend who owned a real estate agency store and persuaded the agents of the store to try the MyGo service.

There were two goals of the content management in this stage, and they were to classify real properties and needs specifications and to acquire real properties and needs specifications. In classifying real properties and needs specifications, the MyGo service managers divided them into several segments by their locations. In acquiring real properties and needs specifications, the MyGo service managers asked the MyGo Company employees to contribute some real properties and needs specifications. There was one goal of the control management in this t stage, and it was to build service image. In order to build service image, the MyGo service manager created a specific page, About Us, to describe what the MyGo service was. There were two goals of the capability management in this stage, and they were to build market sensibility and to build platform development ability. In building market sensibility, the MyGo founder interviewed several top managers in related business and conducted a multi-case study to understand the online real estate market. In building platform development ability, the MyGo founder built an IT team and hired IT employees to build the Web application that realized the MyGo service.

- *Changing Point II*

The stage two of the MyGo service development process began in October, 2008, when the MyGo service was launched publicly. In this stage, the main actors were the real estate agents of the MyGo service, the main audiences were the public clients of the MyGo service, and the perception the agents wished to create for the visitor was that I'd like to work with others. In order to make that impression on the client, each of the real property could be rated and collected by the registered member of the MyGo service, and the MyGo agent would rate and collect each other's objects. Besides, agents could jointly promote the real properties by adding other agent as their friends. Additionally agents also could communicate to each other by leaving messages on the personal blog. And the clients could perceive that impression through seeing the interaction outcomes when visiting the blogs of the agents. After accepting that impression, the client might imitate the agent and attempted to become the co-creator of the MyGo service. If so, the client would register a MyGo.com account to login the MyGo platform to contact the agents. In the resonance process mentioned above, the interaction type between the actor and the audience was person-to-person. And the result of that process was that the more successfully the impression delivered and the more people who worked with the agents. Besides, the result could be measured by the impression management indexes, including, U.V., P.V., R.M., Total of real property, Total of needs specification of real property, Total of comment, Total of message, Time on site, and Frequency of repeating visit. To maximize the resonance, the MyGo service managers attempted to make their efforts in three dimensions, including co-creator, content and capability. There were two goals of the co-creator management in this stage, and they were to acquire more agents, and to improve the agent's quality. In acquiring more agents, the MyGo built a sales team and the team visited the real estate agency retail stores one by one. In improving agent's quality, the MyGo hosted a serial of workshops to educate the agents how to build their personal brands on the Internet through the MyGo service.

There were one goal of the content management in this stage, and it was to acquire more real properties. In acquiring more real properties, the MyGo hosted a serial of education workshops and encouraged the agents learning by doing so that after the workshop the agents also uploaded all the real properties they had. The goal of the capability management in this stage was to build capability of reaction to co-creator's feedback. In order to achieve the goal, the MyGo provided service phone and service email, because the agents were used to call for help through phone immediately when they contacted IT troubles.

- *Changing Point III*

The stage three of the MyGo service development process began in May, 2009, when the Agent Group feature was released. In this stage, there were two main actors and they were the super agent of the MyGo service and the specific-location agent group. The former was the MyGo agent who was famous in the MyGo community, and the later was the group which was composed of the MyGo agents. There were also two main audiences in this stage and they were the internal agents of the MyGo and the external potential clients of the MyGo agents, including the buy-side clients and the sell-side clients. The perception the super agent wished to create for the external clients was that I'm good at specific areas and I'd like to be contacted by you. And the perception the specific-location agent group wished to create for other MyGo agents was that we were good at specific areas. In order to make that impression on the external clients, the super agent frequently updated his or her blog and bought the ad placement in the homepage of the MyGo.com. And the external clients could perceive that impression through reading ad placement and visiting his or her blog. After accepting that impression, the client might attempt to contact the super agent. In the resonance process mentioned above, the interaction type between the actor and the audience was person-to-person. And the result of that process was that the more successfully the impression delivered and the relative more clients contacted with the super agent. Besides, the result could be measured by the impression management indexes, including, U.V., P.V., Time on site, Frequency of repeating visit, Frequency of contacting the agent, Revenue, and Premium Member (for short, P.M.). In order to make that impression on the internal agent, each of the agent groups has its own section, an independent page, in which there was group information, including the real property objects provided by the members of this group, the group name, the group description and the member list of this group. And the agent could perceive that impression through visiting the group section. After accepting that impression, the agent might sign to join certain groups, or might apply to initiate a new group. In the resonance process mentioned above, the interaction type between the actor and the audience was group-to-person. And the result of that process was that the more successfully the impression delivered and the relative more agents of the group were or the relative more real properties from the agent group were. Besides, the result could be measured by the impression management indexes, including, U.V., P.V., R.M., R.G, Total of agents of a group, Total of real property objects of a group, Time on site, and Frequency of repeating visit. To maximize the

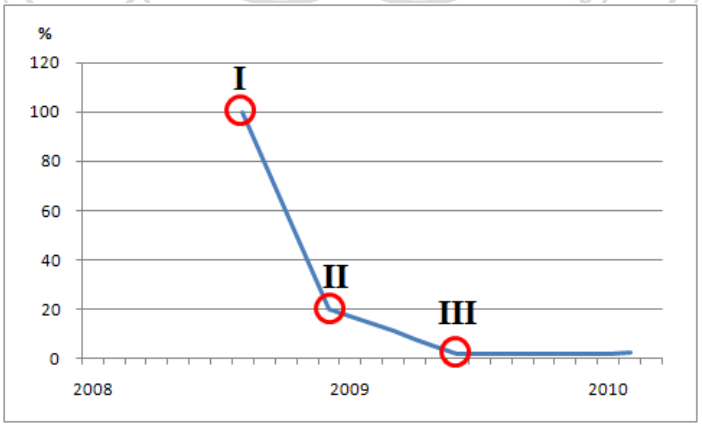
resonance, the MyGo service managers attempted to make their efforts in four dimensions, including co-creator, content, control and capability. There were three goals of the co-creator management in this stage, and they were to acquire more real estate agents, to acquire professional agents of different types, and to strengthen agent's communication ability. In acquiring more real estate agents, the MyGo recruited top managers from its competitors. At the same time, the MyGo cooperated with the Century 21. In acquiring professional agents of different types, the MyGo acquired four companies. In strengthening agent's communication ability, the MyGo released several features. There were three goals of the content management in this stage, and they were to acquire more real properties, to improve content's accessibility, and to synchronize content. In acquiring more real properties, the MyGo cooperated with the Century 21. In improving content's accessibility, the MyGo released new feature, MyGo Search. In synchronizing content, the MyGo streamlined the process when publishing the content. There were two goals of the control management in this stage, and they were to establish trusted environment, and to enhance professional image. In establishing trusted environment, the MyGo made efforts to synchronize with the Century 21 system to authenticate the Century 21 agents. At the same time, the MyGo authenticated other agents through cell phone. In enhancing the professional image, the MyGo cooperated with the international organization CCIM. There were four goals of the capability management in this stage, and they were to build capability to gain the external potential clients of the real estate, to build capability of marketing, to build capability of profit earning, and to build capability of online real estate agent community management. In order to gain the external potential clients of the real estate, the MyGo advertised in the Apple Newspaper, made video promotion in Youtube, created official Plurk account, and created official Facebook account.

- *Changing Point IV*

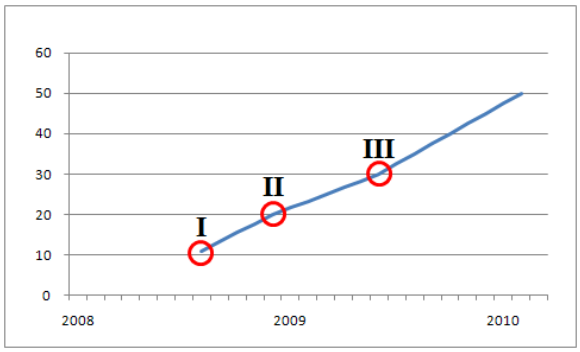
The stage four of the MyGo service development process began in March, 2010, when the MyGo News service was launched. The main actor in this stage was the whole MyGo community. There were two main audiences in this stage and they were the chain of retail stores of real estate agency and the business partners, including the real estate constructors and the online portals like Yahoo. The perception the whole MyGo community wished to create for the two audiences was that we were the best among others in online real estate market. In order to make that impression on the chain of retail stores of real estate and the business partners, the whole MyGo community gathered a mass of various professional agents related to the real estate and continuously exported high-quality realty content. And the audiences could perceive that impression through reading the exported content and the community information in various mass media. After accepting that impression, the online portals might attempt to cooperate with the MyGo and outsourced their real estate section to the MyGo, by which the portals and the MyGo could exchange and share the content and the member resources. And the real estate constructors might attempt to cooperate with the MyGo and buy the ad placement to reveal their building projects. And the chain of retail stores of real estate agency might attempt to create the store team through the Agent Group feature. In the resonance process mentioned above, the interaction type between the actor and the audience was group-to-group. And the result of that process was that the more successfully the impression delivered and the relative more influence the whole MyGo community was. Besides, the result could be measured by the impression management indexes, including, U.V., P.V., R.M., Time on site, Frequency of repeating visit, Frequency of contacting the agent, Revenue, P.M., R.G., Total of agents of a group, Total of real property objects of a group, and Total of business partners. To maximize the resonance, the MyGo service managers attempted to make their efforts in three dimensions, including co-creator, content and capability. The goal of the co-creator management in this stage was to retain the current agents. In order to achieve the goal, the MyGo provided more marketing tools and sales kits to encourage real estate agent to continuously cultivate his or her blog. The goal of the content management in this stage was to produce the real estate news. In order to achieve the goal, the MyGo established a new section to produce in-house content for MyGo News platform. The goal of the capability management in this stage was to build the re-invention capability. In building re-invention capability, the MyGo hired an experienced editor in realty column to build a news team, invested in building a medium studio, and reused their original IT team to collaborate to re-invent the MyGo service by adding the new service, MyGo News.

■ WEnews

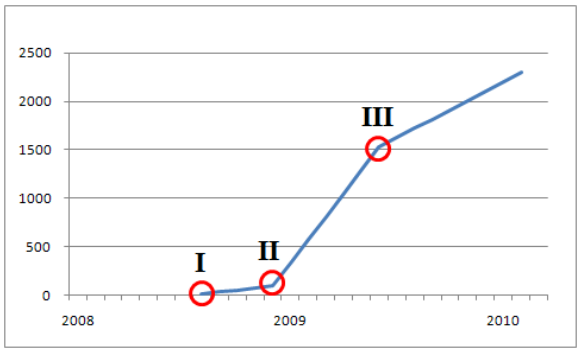
The Business Next Magazine published a research result in March, 2010, in which the NOWnews.com was the second popular online original news website in Taiwan. WEnews is a user-generated section of the NOWnews.com as positioned to realize the citizen journalism. Everyone can register to be the reporter of WEnews through applying a free account of the NOWnews.com. With the account, users can report the news and the news will immediately be visible on the WEnews platform without any advanced review. Each of the news reported to WEnews has opportunity to be exported to the NOWnews.com and even to the portals like Yahoo. Once the news is adopted by the NOWnews.com, the reporter can gain a monetary reward from the NOWnews.com. There is a group of WEnews editors who are also the employees of the NOWnews.com and response to recommend the editors of the NOWnews.com some interesting news from WEnews. In such situation, the editors of the NOWnews.com are like the clients who pay the WEnews reporters for their stories. And the WEnews editors are like the agents who serve the WEnews reporters to sell their stories to the editors of the NOWnews.com. When considering the news interesting or not, the WEnews editors not only rely on their professional judgment but also take account of the WEnews readers' opinions. That means even a reader can influence the news exportation. Until now, WEnews has become the biggest online citizen journalism community in Taiwan and there are over 2,000 reporters on the platform. In order to understand the WEnews service development process, we conducted a face-to-face interview with the major manager of the WEnews service. The following is a discussion of what the co-creator impression is in each phase of the WEnews service development process and how it is managed in different phase, as summarized in Tables F-1 and F-2. In addition, we plotted a scatter diagram of WEnews to portray the patterns of co-creator, viewer, and contribution ratio, all of which are shown in Figure 4-10.



(a) Contribution ratio (Active user / Viewer) pattern



(b) Active user pattern



(c) Viewer pattern

Figure 4-10 Patterns of service contributors, viewers, and contribution ratio on WEnews

- *Changing Point I*

The stage one of the WEnews service development process began in August, 2008, when the NOWnews Network Co., Ltd initiated the WEnews plan, which was conducted by a team of eleven employees of the NOWnews Network Co., Ltd. In this stage, the main actors were the members of the WEnews project, the main audiences were the other employees of the NOWnews Network Co., Ltd, and the perception the project member wished to create for his or her colleague was that I had good news to share with the world. In order to make that impression on the colleague, the project member spontaneously shared the news he or she discovered. And the colleague could perceive that impression through reading the shared news. After accepting that impression, the colleague might imitate the project member and attempted to become the co-creator of the WEnews service. If so, the colleague would use his or her NOWnews.com account to login the WEnews platform to report the news he or she discovered. In the resonance process mentioned above, the interaction type between the actor and the audience was person-to-person. And the result of that process was that the more successfully the impression delivered and the more audiences of the news were. Besides, the result could be measured by the impression management indexes, including, U.V., P.V., R.M., and Total of news. To maximize the resonance, the WEnews service managers attempted to make their efforts in three dimensions, including co-creator, content and capability. The goal of the co-creator management in this stage was to acquire reporters. In order to achieve the goal, all the members of the WEnews project were asked to be the first reporters of the WEnews service. There were two goals of the content management in this stage, and they were to classify news and to acquire news. In classifying news, the WEnews service managers adopted the taxonomy used by the NOWnews.com. In acquiring news, the WEnews service managers asked the WEnews project members to contribute some news. There were two goals of the capability management in this stage, and they were to build market sensibility and to build platform development ability. In building market sensibility, the WEnews team conducted a multi-case study to understand the online citizen journalism market. In building platform development ability, the WEnews team got

the IT support from the NOWnews Network Company to build the Web application that realized the WEnews service.

- *Changing Point II*

The stage two of the WEnews service development process began in December, 2008, when the WEnews service was launched publicly. In this stage, the main actors were the reporters of the WEnews service, the main audiences were the visitors of the WEnews service, and the perception the reporter wished to create for the visitor was that I'd like to know how you feel about my news. In order to make that impression on the visitor, each of the reported news could be rated and commented by the registered member of the WEnews service, and the WEnews reporter would rate and comment each other's news. Besides, the reporter would reply the comment left to him or her by others. And the visitor could perceive that impression through seeing the rating and comment results when reading the shared news. After accepting that impression, the visitor might imitate the reporter and attempted to become the co-creator of the WEnews service. If so, the visitor would register a NOWnews.com account to login the WEnews platform to rate or to comment the reported news. In the resonance process mentioned above, the interaction type between the actor and the audience was person-to-person. And the result of that process was that the more successfully the impression delivered and the more people who interacted with the reporter through rating or commenting were. Besides, the result could be measured by the impression management indexes, including, U.V., P.V., R.M., Total of news, Total of rating, Total of comment, Time on site, and Frequency of repeating visit. To maximize the resonance, the WEnews service managers attempted to make their efforts in three dimensions, including co-creator, content and capability. There were three goals of the co-creator management in this stage, and they were to acquire more reporters, to acquire better reporters, and to increase the reporter's interaction with each other. In acquiring more reporters, the WEnews released a press via the NOWnews.com, which announced the public opening of the WEnews service. In acquiring better reporters, the WEnews financially supported several journalism-related activities in campus, including National Chung Cheng University, Chinese Culture University and so on. In increasing the reporter's interaction with each other, the WEnews hosted the Reporter of the Month contest, in which the winner was the reporter who got the most scores rated by other reporters. There were two goals of the content management in this stage, and they were to acquire more news and to filter better news. In acquiring more news, the WEnews hosted the News Chase contest, in which the WEnews manager assigned the news direction and the WEnews reporters chased and reported the related news events to fulfill the assignment. In filtering better news, the WEnews hosted the Reporter of the Month contest, in which the WEnews reporter could rate each other's news. The goal of the capability management in this stage was to build capability of reaction to co-creator's feedback. In order to achieve the goal, the WEnews opened several basic discussion sections in the WE Discuss forum, one feature of the WEnews service. The WEnews manager hoped that the WEnews

reporters could provide their feedbacks through the WE Discuss forum and these feedbacks would be used in the next service adjustment.

- *Changing Point III*

The stage three of the WEnews service development process began in June, 2009, when the Reporter Group feature was released. In this stage, there were two main actors and they were the super reporter of the WEnews service and the specific-field reporter group. The former was the WEnews reporter who was famous in the WEnews community, and the later was the group which was composed of the WEnews reporters. There were also two main audiences in this stage and they were the internal reporter of the WEnews and the external news material providers, including government and business partners. The perception the super reporter wished to create for other WEnews reporters was that I'd like to be respected by others. And the perception the specific-field reporter group wished to create for other WEnews reporters and the external news material providers was that we were a group of reporters interested in the same field. In order to make that impression on the internal reporter, the super reporter actively participated in each of the WEnews community activity. And the other reporters could perceive that impression through reading the related activity records. After accepting that impression, the reporter might imitate the super report and attempted to become the super co-creator of the WEnews service. In the resonance process mentioned above, the interaction type between the actor and the audience was person-to-person. And the result of that process was that the more successfully the impression delivered and the relative more famous the super reporter was. Besides, the result could be measured by the impression management indexes, including, U.V., P.V., Total of news adopted by NOWnews.com, and Total of election of Reporter of the Month, Time on site, and Frequency of repeating visit. In order to make that impression on the internal reporter, each of the reporter groups has its own section, an independent page, in which there was group information, including the news reported by the members of this group, the group name, the group description and the member list of this group. And the reporter could perceive that impression through visiting the group section. After accepting that impression, the reporter might sign to join certain groups, or might apply to initiate a new group. When a new group was been initiated, the initiator needed to call for five signatures to make the group established. In the resonance process mentioned above, the interaction type between the actor and the audience was group-to-person. And the result of that process was that the more successfully the impression delivered and the relative more reporters of the group were or the relative more news from the interview group were. Besides, the result could be measured by the impression management indexes, including, U.V., P.V., R.M., R.G, Total of reporters of a group, Total of news of a group, Time on site, and Frequency of repeating visit. The external news material providers also could perceive that impression through visiting the group section. After accepting that impression, the providers might contact the WEnews managers to provide their good stories if the group property was matched with the provider property. If so, the provider would make a

business deal with the WEnews. In the resonance process mentioned above, the interaction type between the actor and the audience was group-to-group. And the result of that process was that the more successfully the impression delivered and the more external story providers were. Besides, the result could be measured by the impression management indexes, including B.P. and Revenue. To maximize the resonance, the WEnews service managers attempted to make their efforts in four dimensions, including co-creator, content, control and capability. There were six goals of the co-creator management in this stage, and they were to acquire more reporters, to acquire better reporters, to classify reporters, to enhance reporter's emotional relationship with the WEnews community, to improve reporter's quality, and to certificate reporter. In acquiring more reporters, the WEnews promoted the popular or the new reporter groups in the homepage. In acquiring better reporters, the WEnews started to cooperate with several community universities. In classifying reporters, the WEnews released the feature called Reporter Group and established a new member rank system. In enhancing reporter's emotional relationship with the WEnews community, the WEnews hosted three physical gatherings and released new feature called WE Club, in which the WEnews reporters can talk casually. In improving reporter's quality, the WEnews managers posted a serial of guidelines about how to be an excellent reporter in the WE Discuss forum. In certificating reporter, the WEnews made the ID card to each of the WEnews reporters and this card could help the reporters get interview permission. There were two goals of the content management in this stage, and they were to acquire more news and to acquire better news. In acquiring more news, the WEnews started cooperate with government and business partners. In acquiring better news, the WEnews managers adjusted the recommendation standard to be stricter, and they hoped that the new standard could push the reporters to generate better news if they wanted their news to be exported to the NOWnews.com. The goal of the control management in this stage was to protect intelligence property. In order to achieve the goal, the WEnews established a new authorization system, in which there were three types of authorization that could be used to grant external users to reuse the news. And every reporter could determine which authorization was applied to the news he or she reported. There were three goals of the capability management in this stage, and they were to build capability of project management, to build capability of marketing, and to build capability of online reporter community management.

CHAPTER 5: DISCUSSION

The context in which Web 2.0 services were developed can be explained by understanding the fundamentals of IM. IM can represent the state of Web 2.0 services and the challenges faced by service managers. Web 2.0 services in different phases will have different states where service managers get to face different actors and audiences. Service managers also need to manage different impressions and resonances.

The same way IM is about the context of Web 2.0 services analysis, 4C is about the actions that service managers take to pass through each service phase. In this study, we use the "goals-and-means" structure to analyze any possible actions that can be taken in the service development stage and classify them into 4 management dimensions.

Service managers should be aware of the different development phases. In different phases, managers must decide from a variety of actions the right specific solution to achieve their goals. In order to offer managers more precise solutions when they develop Web 2.0 services of different types, we will separate our six cases into two types according to the core value of services; knowledge-accumulated type (K type) and social-network (S type and the differences of IM contexts in the services of these two types. And we also will explain the detail of each action and the differences of 4C actions when managers develop different services.

In the following discussions, we first discuss IM for different life stages of Web 2.0 services. Then we discuss IM for different type services. Next, we discuss 4C for different type services and explain the details of each 4C action.

5.1 IM for different life stages of Web 2.0 services

We consider that the development of Web 2.0 services is a cyclic life cycle, showed as figure 5-1. Because after the service re-invention, there is new service value created. Based on the result of cross-case analysis, we compile a table of the general impression management for different life stages of Web 2.0 services, showed as table 5-1.

Based on the analysis results of eight cases in this study, we found that there are different impressions that should be managed in different life stages of Web 2.0 services development and it verified our research proposition.

In the impression management context of the first stage of Web 2.0 services development life cycle, the main actor is the internal co-creator, like the service founders and the service development team. The impression is about share. The audience is a certain group, a specific target with the limited number of people chosen by service founders. For example, Facebook founder chose

Harvard students as the first audience and didn't allow others to use the service. At this time, the type of resonance between actor and audience is person to person. The resonance happened when actors share something and the audience read the information shared. After the resonance, some audience will become part of the actors and start to share more information. As a result, the number of actors is going will grow exponentially.

In the impression management context of the second stage of Web 2.0 services of the development life cycle, the main actors are not only the original internal co-creators, but also its audience. These actors want to express not just the impression of sharing in one direction, but in advance they eager to express the impression of interacting in bio-directions. The audience is not longer limited by the original founder's target. The service starts to diffuse outside into other groups and contact other audiences. Those audiences are called public viewers. At this time, the type of resonance between actor and audience is still one on one. The approaches of resonance are more than that in the previous stage. Besides this, more resonance from interactions comes into the service, like communicating, rating, voting and so on. Interactions will create further more interactions. After the resonance, not only actors get more but also interactions between users get more frequent.

In the impression management context of the third stage of Web 2.0 services development life cycle, a new level of actor appears in the service and we call it group actor. Group actor is the virtual group, which is formed by personal actors. Personal actors with same interests interact online frequently and as a result they will gradually gather to build a virtual group. Once the personal actor belongs to a certain group, he will no longer just express his own impressions; he will assist to express the impression of his group. In order to make the group become larger, each group begins to express its impression to other actors. Some actors will join the existing groups, and some will create their own ones. As a result, there are more and more virtual groups and some of them become larger and larger.

In the impression management context of the fourth stage of Web 2.0 services development life cycle, similar to the process of the birth of group actor from individual personal actor, those competitive virtual groups begin to cooperate and they form a whole service community. We call this new level of actor as community actor. The influence of community actor is more powerful than that of group actor. Group actor only affects the people inside the service. Community actors affect both the people inside and outside the service. With its influence, the community actor can cooperate with other service partners to co-create new added service value. The influence is not restricted to the virtual world, but it also affects the real world. Therefore more and more physical business partners look for cooperation with the community actor to co-create new bilateral service value. This cooperation will attract more actors and be good for retaining the current actors. At the same time, the synergy of the cooperation will give the service another service life cycle.

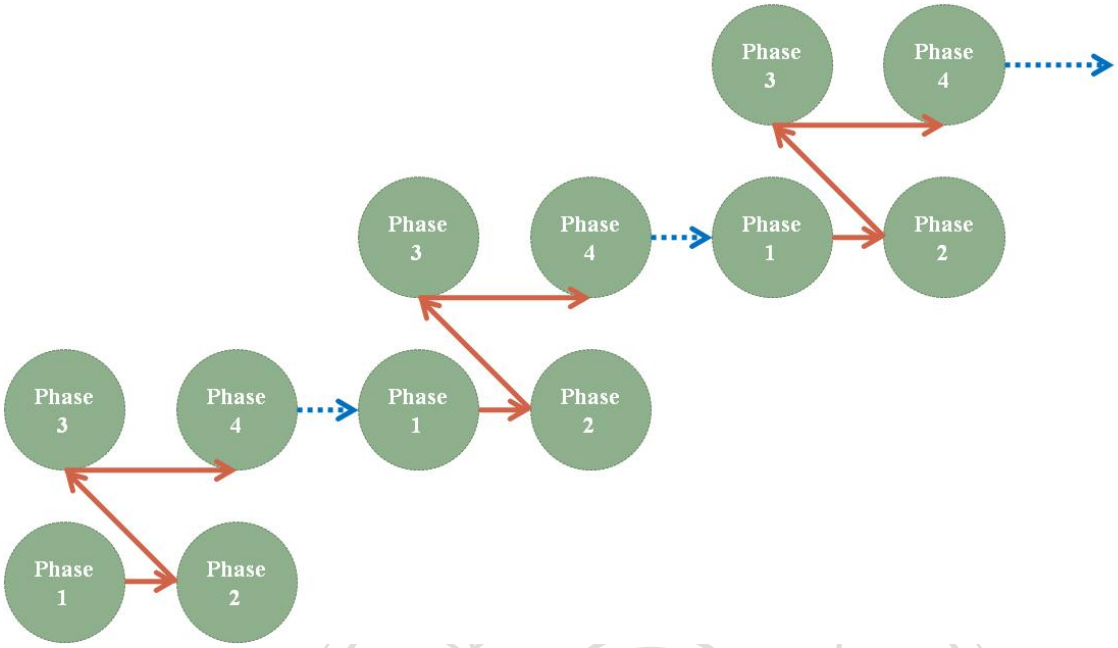


Figure 5-1 Cyclic four-phase life cycle of Web 2.0 services development

Table 5-1 IM for different life stages of Web 2.0 services

	Stage I: Model Establishment	**Stage II: Innovation Dispersion**	**Stage III: Community Expansion**	**Stage IV: Service Re-invention**
Actor	Internal co-creator	1. Internal co-creator 2. External co-creator	1. Internal co-creator 2. External co-creator 3. group of co-creators	1. Internal co-creator 2. External co-creator 3. group of co-creators 4. Whole service community
Impression	About share	About interaction	About organization	About Union
Audience	Limited viewers	Public viewers	1. Public viewers 2. Current co-creators	1. Public viewers 2. Current co-creators 3. Service partners
Resonance status	Audiences read what actors share.	1. Audiences read what actors share. 2. Audiences join the interaction of actors.	1. Audiences read what actors share. 2. Audiences join the interaction of actors. 3. Audiences and actors gather to form various groups.	1. Audiences read what actors share. 2. Audiences join the interaction of actors. 3. Audiences and actors gather to form various groups. 4. Audiences and actors collaborate to re-invent new service values.
Resonance type	Person to person	Person to person	1.Person to person 2.Group to person	1.Person to person 2.Group to person 3.Group to group
Reality	More actors	1.More actors 2.More interactions of actors	1.More actors 2.More interactions of actors 3.More groups of actors	1.More actors 2.More interactions of actors 3.More groups of actors 4.More service values

5.2 IM for different platforms of Web 2.0 services

We roughly classify our six cases into two service types according their core value of services. One is knowledge-accumulated service (K type). K type service is built to achieve the goal of building a platform to accumulate and share knowledge. And most importantly, the shared knowledge will be kept in the platform and can be searched and re-used by the people who come to the platform later. The other type is social network service (S type). S type service is built to achieve the goal of building a platform to develop a personal relationship network. The platform can used to share everything. Contrast to the K type service, the content of S type service does not have to be subject-specific. The achievement of the S type service is not any kind of knowledge but a connection to represent the personal relation network. The following will discuss the difference of IM contexts in these two types of services.

In the first two stages, the impression management of S type service is the same as that of K type services. However, from stage three, there are different types of impression management in different platforms of Web 2.0 services. In social network services, more and more super groups will form. The super groups are the ones with relative more members in the community. The group members gather due to their same interests. The impression of super group is that we are the same. In knowledge-accumulating services, more and more superstars will show up. The superstar is the service member who has relative more fans in the community. Fans gather around the superstar to read the content provided by the superstar. The impression of superstar is that I am good. The details of the two types of impression management are showed in tables 5-2.

Table 5-2 IM for different platforms of Web 2.0 services

	Social network service	**Knowledge accumulated service**
Actor	Super-group	Superstar
Impression	We’re the same	I’m good
Resonance status	1. Relatively broad interaction with relatively strong peer pressure for sharing, like gaming, talking or exchanging files 2. Growth of members of group	1. Relatively strict interaction with relatively slight peer pressure for sharing , like commenting or evaluating to specific knowledge 2. Growth of fans of star
Reality	1. Larger and larger group 2. More and more super-groups due to imitation effect	1. More and more famous star 2. More and more superstars due to imitation effect

5.3 4C management for different platforms of Web 2.0 services

Based on the result of our cross-case analysis, we find that the four C management dimensions can be divided into two groups, main dimension and supportive dimension. Co-creator management and content management belong to a main group, and control management and capability management belong to a supportive group because supportive managements eventually help main managements to accumulate, retain, and improve quantity and quality of either co-creator or content. We compile a list of common management goals and means in the main dimensions, showed as table 5-3 and table 5-4. We compare knowledge-accumulating Web 2.0 services with social interaction Web 2.0 services, and we find that there are only four management goals occurring in the knowledge-accumulating Web 2.0 services. These four management goals are “To acquire better co-creator”, “To improve co-creator’s quality”, “To filter better content”, and “To synchronize content”.

Co-creator management is one of the main managements in the Web 2.0 service development. There are several goals involved and means used to solve them. In order to acquire the initial co-creators, service founders and his team devote themself to be the first co-creators. We call this approach as in-house devotion. It is easy to use and suit to services of both types and there is no exception in our six cases.

After acquiring initial co-creators, the service needs to get more co-creators. The approaches to get more co-creator are variety. As listed in table 5-3, we compiled nine means.

Public promotion is to use mass media to promote the service .For example AnswerBox frequently creates online campaigns associated with certain special festivals. One instance of them is that AnswerBox offered its users a virtual party. The subject of this campaign is to celebrate the official opening of a new AnswerBox service. They also made invitation cards and invited Internet users to join this party. And most important, they sent the press to the mass media to announce the news in advance. After the party, they organized what happened in the gather information gain from the party and reported it to the media again in the form of the press releases. They leveraged the influence of the mass media to acquire more co-creators. Five of our six cases have adopted this means.

In contrast to public promotion, there are two similar means and they are intra promotion and joint promotion. Intra promotion can be used to increase interaction among co-creators and to classify co-creators. This means to continually notify users what happened in the service and to host in-site activities to let users interact to each other. Joint promotion is to cooperate with other service partners to host activities. This approach can be used to acquire more co-creators and better co-creators.

“Users acquire users” is to encourage current users to bring their friends to join the service. For example, both of AnswerBox and iPeen design an invitation policy to encourage their service users to invite their friends via email or msn to register as the service users. In order to let their users easily invite their friends, both of AnswerBox and iPeen develop special service function to do so.

“To recruit opinion leader from related community” is especially useful when the service is in its initial stages. For example, PlaySport hired the manager of lottery forum of PPT. After few days, hundreds of co-creators followed the manager to join PlaySport service. Similar to this approach, we can apply the same idea to bloggers. To leverage famous bloggers also benefit to acquire better co-creators like what iPeen did.

“To expand service” is to add more service values without changing the service position in the market. For example, PlaySport offered “winner of hundred times prize”. It allowed users to show off their happiness to other users enhancing its co-creator’s emotional relationship.

“Enlarge customer through business alliance” is to cooperate with other business partners to provide new service value. For example, iPeen cooperated with Google. iPeen offered the article contents and store information to Google in exchange to use its map mechanism to co-create a food map service. This approach is also good for acquiring better co-creators.

“Enlarge customer through business integration” is to acquire other business partners. It is a little bit different from the alliance we just discussed. It is a closer relationship between the two parties. For example, MyGo acquired a cosmetics-related service to get professional agencies of different types.

SEO is abbreviation of Search Engine Optimization. It is to adjust the website content to fit the search engine’s rule. After optimization, the service can be more easily found via the search engine. For example, iPeen enhances the titles, meta-data, alternative text of images and geographic information for each of its pages. As a result, not only the traditional search engine but also the map search engine can easily index the content of iPeen and users can easily access them through search engines.

“To expand market horizontally” is to copy the current successful service model to another market without adding extra service functions. For example, ihergo shifted its original market to local community and school campus.

Beside aquaring co-creators, it is also important to increase interaction among co-creators in the co-creator management. Of the corresponding approaches, besides “intra promotion”, there is “to increase functionality”. The goal is to add communication functionality to enhance original communication facilities. For example, users of ihergo can discuss their co-buying affairs to their members in their group pages initially. In order to increase the interaction among users who belong to different groups, ihergo added public forum. Now users who belong to different groups can communicate to each other in public forum. This approach is also good for strengthening co-creator’s communication ability and strengthening co-creator’s representation ability.

As the number of co-creators becomes more and more, the frequency of their interactions becomes more and more frequent. As a result of this interaction, we will see that a variety of virtual groups gradually appearing. If co-creators can identify those who have the same interests with them, co-creators can easily interact to each other enhancing its service development. Beside “intra promotion”, there is also “user self-management” which is use to design mechanisms to allow users to build a team with other users. For example, co-buying masters of ihergo will actively promote their groups to other users to recruit them. Users of ihergo also can actively ask co-buying masters to allow them to join the groups. Co-buying masters are in charge of classifying the users. As a result, each user of ihergo at least belongs to one group. Of course, one user can belongs to more than one group. It is up to you.

The service managers should pay their attentions to take care of the interactions among co-creators. At the same time, they also need to maintain the emotional relationship between co-creators and the service itself.It is also good for retaining co-creators.To do so, beside “ to expand service”, there are two approaches and they are “physical contact” and “frequent virtual contact”.For example, the manager of WeNews service will meet co-creators frequently.Maybe in a teatime afternoon, they meet in a coffee shop and talk each other’s life and even discuss their expectations about WeNews service. Another example is that both AnswerBox and iPeen assign special personnel to be in charge of contacting users online. The personnel will actively say hello to the new users, to visit users’ page and leave a greeting message and so on. As what AnswerBox service founder said, “We are a big family and here is full of warm atmosphere.”

The motivation of co-creators to be willing to continually co-create can be enhanced. The approach, “to develop indexes to measure participation degree”, is to design a mechanism to evaluate and visualize the co-creators’ contribution. The index could be numeric or could be a kind of badges to award the special contribution offered by co-creators. For example, iPeen’s “P coin system” is used to evaluate the degree of user participation. Users can earn more P coins if they obey the rules made by iPeen. P coin is not only a kind of incentives to encourage users do what should do in iPeen. But also it can be used as a kind of punishment tool to punish users if they do something bad that ruin the service order or reputation. Another example is PlaySport’s award predictors with badges.

The last item of co-creator management goal is to retain co-creators. As listed in table 5-3, we compiled three approaches. “To regulate community order” is to design service usage rules and to assign order managers. Order managers are in charge of keeping the community in order by enforcing its rules. For example, there are many predictors published articles in PlaySport to show their opinions and insight about sport games before the games begin. They also predict the result of games. These articles will affect other PlaySport users’ behaviors. The readers may believe what the article say and then buy the sporty lottery. However the result of games may not match what the articles say. Occasionally, some unreasonable users will publish negative articles to curse the predictors. In such situation, the order manager must handle this immediately to ensure the predictors avoided from the literal attack. Otherwise the predictor may be afraid of predicting and do not predict any more. That will be bad for the service development.

“To reinvent service” is to re-engineer the whole service from core value, market position and website functions to provide users a brand new service value. Different from “to increase functionality” that do not add additional service value merely enhance original website functions and “to expand service” that add additional service value but still not change the service core value and remain the same market position, this approach is about dramatically renew the service itself. For example, iPeen was used to serve as a website to discuss experience about eating. Afterward it transformed as a website to discuss life experience not limited to eating. In order to do so, iPeen develop many new website functions and design specific rules for different markets. It is totally different from the original eating discussion when discussing clothes, travels, cars and so on.

“To create subject” is to create virtual in-site activities to lure users to login every day. For example, AnswerBox hosted “poke poke fun” game online. If user login the AnswerBox, he will get one chance to poke a hole on the screen. And then he will possibly get a prize. This activity was very successful for retaining the users in the AnswerBox’s experience.

Table 5-3 Co-creator management for different platforms of Web 2.0 services

Goal		Means	Example: S	Example: K
Co-creator	To acquire first co-creator	In-house devotion	ihergo AnswerBox PlaySport	iPeen MyGo WEnews
	To acquire more co-creator	Public promotion	ihergo AnswerBox PlaySport	iPeen WEnews
		Users acquire users	AnswerBox	iPeen WEnews
		To recruit opinion leader from related community	ihergo PlaySport	MyGo
		To expand service	PlaySport	
		Enlarge customer through business alliance	Ihergo AnswerBox PlaySport	iPeen MyGo
		Enlarge customer through business integration		MyGo
		SEO		iPeen
		Joint promotion	ihergo AnswerBox	iPeen
		To expand market horizontally	ihergo	
	To acquire better co-creator	Joint promotion		WEnews
		To recruit opinion leader from related blog		iPeen
		Enlarge customer through business alliance		iPeen
	To increase interaction among co-creators	Intra promotion		WEnews
		To increase functionality	ihergo	
	To classify co-creator	User self-management	ihergo AnswerBox	iPeen WEnews
		Intra promotion	PlaySport	WEnews
	To enhance co-creator's emotional relationship	Physical contact		iPeen WEnews
		To expand service	PlaySport	
		Frequent virtual contact	AnswerBox	iPeen
	To improve co-creator's quality	User education		MyGo WEnews
	To enhance co-creator's intrinsic motivation	To develop indexes to measure participation degree	PlaySport	iPeen
	To retain co-creator	To regulate community order	PlaySport	iPeen
		To reinvent service	ihergo AnswerBox PlaySport	iPeen MyGo
		To create subject	AnswerBox	
	To strengthen co-creator's communication ability	To increase functionality	ihergo	MyGo
	To strengthen co-creator's representation ability	To increase functionality	ihergo	iPeen

Table 5-4 Content management for different platforms of Web 2.0 services

Content	To acquire first content	In-house devotion	ihergo AnswerBox PlaySport	iPeen MyGo WEnews
	To acquire more content	Enlarge resource through business alliance		MyGo WEnews
		Intra promotion		WEnews
		User education		MyGo
		Joint promotion		iPeen
		To expand service	AnswerBox	
	To re-organize content	To recruit volunteer community coordinator	ihergo PlaySport	
	To filter better content	Users evaluate each other's work		iPeen WEnews
	To improve content's accessibility	To re-arrange content section	ihergo PlaySport	
		To increase functionality	ihergo AnswerBox PlaySport	iPeen MyGo
	To enrich content	To expand service	PlaySport	
	To produce high-quality content	Expert production	PlaySport	MyGo
	To acquire better content	Intra promotion	PlaySport	
		To enhance co-creator's motivation	PlaySport	WEnews
	To deny inappropriate content	To develop automatic filter system	PlaySport	
	To improve content's readability	To re-arrange content section	ihergo PlaySport	
		To visualize content via Google map		iPeen
	To synchronize content	To streamline operation		MyGo
	To improve content's reliability	Users evaluate each other's work	ihergo	iPeen
		To modify functionality		iPeen

5.4 KM pattern for different platforms of Web 2.0 services

Content management is one of the four dimensions we propose in this work. With the development of Web 2.0 services, more and more contents are accumulated. These contents are the assets of Web 2.0 services, and they can be reused for the service re-invention. These contents can also be explored to exploit knowledge. Based on the result of cross-case analysis, we find that there are two types of knowledge development pattern. The first pattern occurs in the knowledge-accumulating Web 2.0 services while the other occurs in the social interaction of Web 2.0 services. Theoretically, there are two dimensions to the knowledge development. These two dimensions are richness and range. The general curve of knowledge development is noted as T in figure 5-2. In the curve, richness is opposite to range. We find that the curve of knowledge management of knowledge-accumulating Web 2.0 services starts with more richness and less range, and ends with deep richness and some range, noted as K in figure 5-2. And the curve of knowledge management of social interaction Web 2.0 services starts with less richness and more range, and ends with wide range and shallow richness, noted as S in figure 5-2.

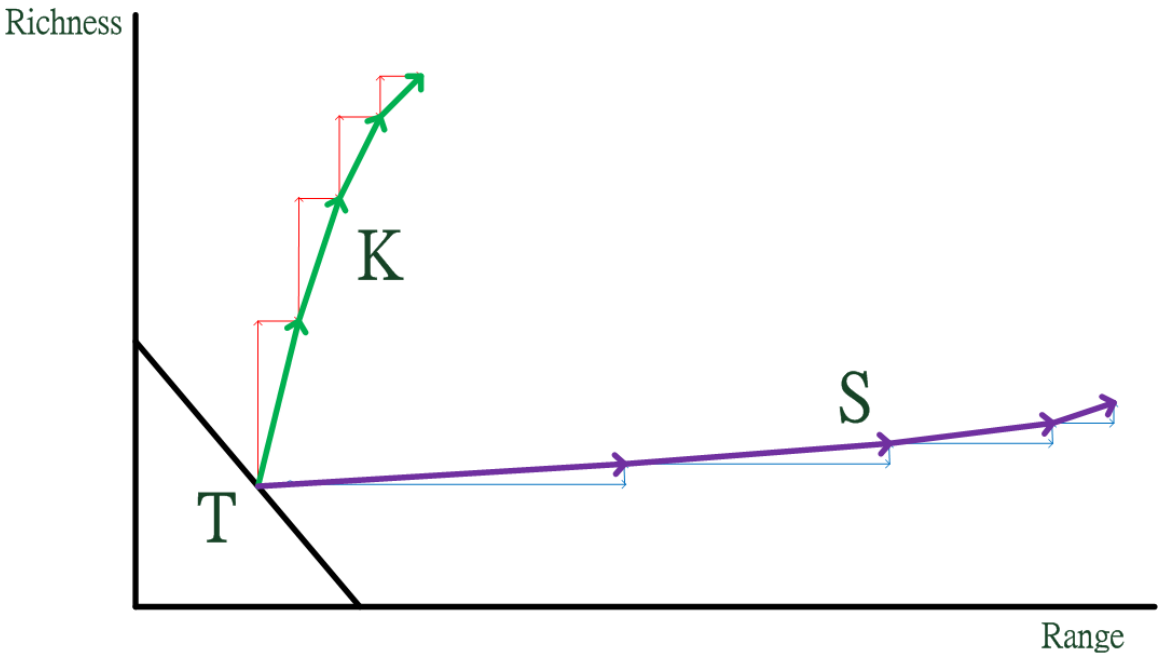


Figure 5-2 KM pattern for different platforms of Web 2.0 services

CHAPTER 6: CONCLUSION

The life cycle of Web 2.0 services development origins from the idea by which the service founder can share something to others of a certain group. When moving to the next stage of the life cycle, more people even those outside the group come into the service and they interact with each other by using the service. As a result of the interaction, the service users divides into variant virtual groups in the third stage of the life cycle and each group self-manages its members, cultivates deeply its content and transform it into some kind of knowledge they are interested in. Eventually, in the last stage, those individual virtual groups form the whole service community, which keeps evolution internally and cooperates with external units, for example another service community or physical business partner, to retain its current community members or to acquire the additional community members through continually creating and sharing the new service value.

In exploring the process of Web 2.0 services development, this study first reviewed related literatures regarding critical features of Web 2.0 service development, and we learned that the service user participation is the key feature of Web 2.0 services that makes Web 2.0 services different from other technologies and affects greatly Web 2.0 services development. We also learned that there is an inequality of Web 2.0 services user participation, and then we explained this phenomenon based on the impression management theory and in advance we used the ratio of the Web 2.0 services user participation derived from the inequality to observe the Web 2.0 services development. Afterward, we identified a four-phase life cycle of Web 2.0 service development through analyzing two typical cases, Facebook and Wikipedia. After expert interviews, we proposed the four phases of the Web 2.0 service development model, including model establishment, innovation dispersion, community expansion, and service re-invention, and these phases are a cyclic lifecycle. It starts from the model establishment phase, through innovation dispersion and community expansion, to the service re-invention phase, and then after the mature phase the service may begin another cycle with new increments of co-creator numbers. We also analyzed the management of each phase by four dimensions, and they are co-creator management, content management, control management and dynamic capability management. We named it as 4C management for short and provided some management means for each of them according to our six case studies.

There are two aspects of implications in this study. For academics, the study provides a systematic overview of the disparate research results (such as technology innovation and diffusion, user motivation for participation and service management) on Web 2.0 services development, and is expected to offer researchers more understandings of Web 2.0 services development for future researches regarding innovation development. For practical management, the study suggests that the viewer indicator, the active user indicator, and the contribution ratio can be viewed as measurement indicators for the management of Web 2.0 platforms. The platform managers can observe the pattern of contribution ratio to judge which phase they are in, and then they can

further pay attention to prevent basic “4C” challenges—content, dynamic capability, control, and co-creators—which exist separately in all four phases. It is hoped that the elaboration of the life cycle of Web 2.0 service development can provide strategic input into the management of Web 2.0 services.

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