

Expanding SNS Features with CE Devices: Space, Profile, Communication

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Abstract. A social network service (SNS) beginning in online increasingly penetrates everyday life deeper and represents new business opportunity with expanded network. Indeed, many SNSs are being served with mobile devices via broadband network. However, there are enormous challenges that must be overcome to provide seamless experience on these mobile devices because of context of use. In the present paper, new definition of SNS is proposed with focus on CE devices building on general features and definition. Accordingly the novel concept and scenarios are presented to compensate users' needs and service & business insights.

Keywords: SNS (Social Network Service), Scenarios, CE devices, Context, Profile, Space, Communication.

1 Introduction

The recent emerging trends- social divides, various users' needs, and technology advance make up brand new social situation called social network services. People, today, share their life, appeal identity via online, and seek to have fun experience: their common features- sharing, connecting, belonging, and blogging- are very faithful to the ones defined as social needs. These trends embrace new business and lead technology innovation. SNS (social network service) such as facebook, cyworld, bebo, QQ, and Mixi are paid attentions to millions of users and on the rise globally, supporting a wide range of interests and practices. A report estimated 24.9 million individual social networking visitors in August 2007 and forecasts rapid growth by next few years globally. The numbers of websites are adding, developing, and refining the features of social networking services and changing the ways in which people use and engage with each other. Also, the methods that the people connect to social network services become vary. As a mobile technology is rapidly advanced, the features of social network services is being served in the device, which represents an opportunities. According to an online user survey, close to half of all social networking users have now visited destinations like facebook via mobile device which implies forty-six percent of social network members have visited their favorite sites on their phones. The young who grown up with embracing the Internet and

mobile technologies make up new opportunities and take benefits of emerging services and negotiate appropriate behaviors within the new communities.

As of the current services, the present paper argues that the features emerged around online SNS have not been capitalized on the unique attributes of the mobile device. A seamless connectivity and data integration between attributes is preliminary tasks to be situation that thousands devices per one person Mark Weiser stated. Accordingly, the clear role and collaboration between machines including CE devices and online within the system should be clearly defined. In this point of view, the present paper conducted user centered design process within system design approach to define problems and find insights dealing with existing online based SNS. Accordingly, revised definition, novel concept, and concept-proof scenarios are proposed to fulfill SNS with CE devices in expanded network.

2 Background Research

Three main tasks were conducted in the background research: literature review, trend, and user research. The purpose of literature review goes over overall previous research works to define the scope. Trend research helps understand current landscape of SNSs to forecast the evolution of future services. User research like contextual inquiry and diary study on paid participants allows refining the core features existing online based SNS and drive core assets in developing scenario.

2.1 Literature Review

Maslow's hierarchy of needs is a theory that extends theory of human motivation to human's innate curiosity. It is composed of five levels of needs and SNS is being existed in social needs- a sense of belonging or building groups of people. SNS generally embraces three key features: profiles, visualization of social relations, and connections to accomplish a task [18]. Similarly,[1] describes that SNS allows individuals to construct a public or semi public profile, articulate a list of other users and view their list of connections. It emphasizes keeping the relations with people who are already a part of their extended social network than looking to meet new people. The profile is described unique pages where one can type oneself into being and backbone of SNS[17]. [12] examined the effects of profiles and visible relations between friends as a major trigger in QQ service. donath and [2] extended this to suggest that public displays of connection serve as important identity signals that help people navigate the networked social world. [16] found that the activity status feature influenced people behaved and what they choose to reveal.

SNSs target homogeneous population likewise specific geographical regions or linguistic group. According to a report [3], a social network services have a tendency to skew in popularity in different regions: mySpace.com and facebook attracts approximately two-thirds of their respective audiences in North America, but not in Asia-Pacific and Middle East-Africa. [8] found the role of national identity in SNS use through an investigation into the brazilian invasion of orkut and the resulting culture clash. Also, Ivins asserted that the success of social network service much depends on cultural characteristics. As SNS continues to evolve over time, it will be

exciting to see if they are able to overcome cross cultural barriers and bring people from different corners of the globe together in fulfilling the truest ideal of social network. Furthermore, as of the extent of cultural characteristics, the relations between socio cultural attributes are examined in terms of actual usage: these are social norm, pleasure, and usefulness. The social norm that statistically influence on the enjoyment encourages participants to have an intention to accept or use when deploying new artifacts [5].

A bulk of research concerning SNS is also focused on participants' behavior and role. By examining previous research on network structure, the four core patterns from certain recurrent roles are structured - disconnected, onion, nexus, and butterfly- and each pattern show how neighbors are connected to him [7]. The patterns show that key-player who deliver or articulate new issues such as information or contents always exists between different groups of people. For example, in the nexus pattern a single persona shares multiple contexts with ego. The two groups of neighbors are linked via single person in the butterfly. A model "the arc of influence" [6] explains how topics spread and influence causes action. The model proposed inverting the arc by putting the target audiences in control and trying to work out how they get influenced so that they accordingly act whether the user's role is influencer or influenced. [13] insisted the roles people played in the growth of networks can be categorized into passive members, inviters, and linkers and similar studies are conducted with other researchers [9,10].

2.2 Trend Research

The competitive analysis was conducted based on territories where it initiates at the first time. A total of three areas are laid out according to their birth place and type of device. One was beginningg in online and expanded to a mobile device later. The second, vice versa, a thing that started in the mobile devices and moved to online, and the third is CE (consumer electronics) based online service in the field of fun experience.

Famous SNSs - facebook, flickr, del.ici.ous. and Linkin- are all categorized into the first one- a start in online and many of them are being currently expanded to mobile device and get paid attention to target users (i.e., facebook, flickr, Youtube). The features being served in this service are dealt with contents store and sharing. In terms of user behavior, online based activities such as blogging, organizing, and sharing are primary tasks, which are supported by way of mobile devices with its mobility. The features, however, are bit entangled in the mobile devices, since they are built on the quite different usage context such as information architecture and interaction, which lead to have different user journey.

As a mobile specific service, Aka-Aki, loopt, mobileme, lifediary, and dodge balls are all included in the second category. A presence or location information via mobile device is additionally provided or works as a tipping point for the target audiences. In this service, a mobile device works as a social mediator since it connects people via mobile censored information: the users who installed same applications which utilizes GPS trajectory on the mobile device are likely to meet strangers or friends within the same area. Furthermore, the audiences of this service are likely to share their photos

or video easier with sync technology embedded in mobile, pc, and online. This is primary differentiator compared to online SNS.

Finally, the third case is CE based SNS. Any owner of CE device can get together in online to enjoy games or hang out with anonymity. In this case, Wii is a pioneer of CE device with SNS. The console box allows invite ones and play game with them via online space. PS3's home, and Live at Xbox are follower in this stream. These services provide a virtual space to invite or host people once the audiences have same device. The home presented by PS3 is very faithful to features of SNS.

2.3 Research Conclusion

The extensive research allows develop the framework for user behaviors dealing with SNSs. Although some exceptions exist, the modern SNSs are very faithful to the features- enjoy and reinforce- as their main motive for usage and likely to be focused on people relations that already exists in real world. An exception is uncovered via profile: one who has same traits - hobbies and interests- is likely to get together and create virtual tribe, however, the goal is same- seeking fun experience or needing information. As a matter of behaviors dealing with content, self presence and knowledge share are cognitive triggers to the feature- store and share. For example, people are likely to store their photos with music in their online homepage with their innate nature. The figure 1 depicts the pattern of user behaviors as what/as is model. The second and third quadrant - collective intelligence and entertainment- implies groups of people who value on the contents. On the other hand, relation and profile matching laid in first and fourth quadrant weight value on the features- reinforce and expand their existing social network.

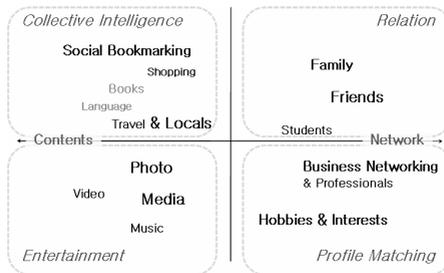


Fig. 1. The quadrant is developed based on contents and social network

2.4 Emerging Technology

The key technologies are found by examining key features of online SNSs. RSS, for example, is a web feed formats used to publish frequently updated works in a standard format. Almost all of the online sites utilize it to publish dates and authorships. They, however, are less considered as new technologies as something that were disappeared rebirths by user needs. The technologies being disappeared in the era of web 1.0 (1990s) came back to fulfill recent user's needs as participation and share. The key technologies underpinning the SNSs are relatively consistent while features concerning

SNSs vary. The features are ongoing to expand to one of applications of a mobile device as previously cited.

This research results allow build a model of what is with common features and technology that states current mobile Internet SNS service. In the figure 2, outer of a circle depicts modern technologies such as Ajax, RSS, open API that make sure the feasibility of online SNSs. A bunch of services such as point of interests, communication, profile matching is built on the web with these technologies. At that situation, other technologies including wireless networking, sensor, and broadband network is presented to connect them to devices and mapping on a mobile device. The profile matching existing in online, for example, needs to be integrated into the contact and profile applications on the mobile devices. Activity log captured by a mobile device syncs online sometime via pc and mash up with map data. Apple recently presents a product “Nike +” using this scheme. Likewise, the feature of communication existing in online is migrated via messaging on a mobile device.

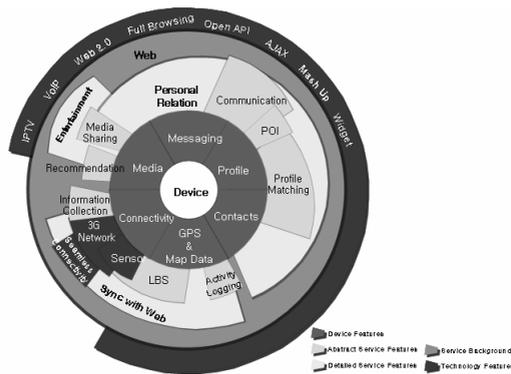


Fig. 2. Key Features and back-end Technologies

2.5 User Research

The reasons for conducting user research in the present study are to refine a proposition of SNS with CE devices via understanding user needs. In order to fulfill purpose, three steps were conducted in the present study: participants according to the social technographics ladder developed by Forrester (2007) are recruited, and having them to write everyday activity on a diary book for a week and asked to grant an interview for three hours through home visiting. The data collected via diary book and contextual inquiry is further analyzed according to the framework proposed by [15].

At the process of recruiting participants, the social technographics is believed to be a good starting point to determine participants’ constituents since it categorizes the people into a ladder with six levels around social participation ranging from creators to inactive. A total number of target participants is 12 people and recruited based on the job profile and personal characteristics by a local agency. A critic, for example, at the hierarchy of behaviors is conceived as active users who are doing activity than reading or consuming contents given in some context of use. With these guidelines, recruiter access a power bloggers or social controversialists who are actively engaged

in online community and asking for participation. The participants ranked at the rest of hierarchy also are recruited by same process. The data obtained by semi structured interview at home visiting and diary, explaining their every day behaviors, are further analyzed to illustrate personal concerns along with a ladder of six levels and activities by the four stages of activities. The four stages of activity proposed by Shneideman separates out an activity spectrum as collect- relate – create – contribute according to the extent to which users participate in.

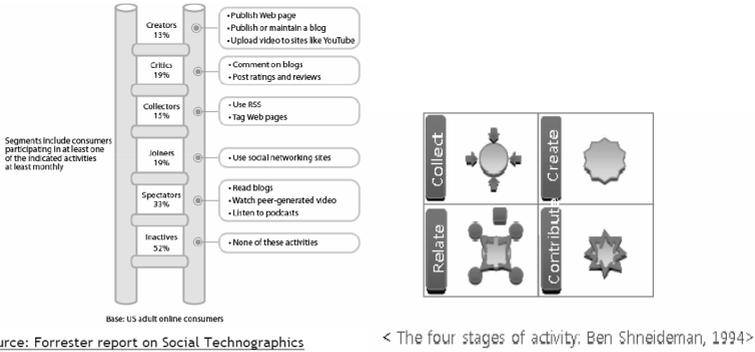


Fig. 3. The social technographics and four stages of activity are setup to build basic framework for user research in the present study

The four activates are assumed as unique values to each participant who involved in a ladder with six levels, which is built as a relationship table. Accordingly individuals’ needs and subsequent activities concerning SNS are described along with four stages of activity (Table 1). They are hypothesized as core competencies to encourage people to be involved in a SNS. The table 1 describes detail activities of each group. A creator group, for example, is featured with the collect and connect, however, create and contribute are not in their concerns.

The user research refines common needs dealing with SNS and accordingly identifies unique features for each group of participants. Four features - recommendation, easy expression, group communication methods, and social presence are identified as overall SNS needs. In addition, each group of participants needs extra- features that could fulfill their specified concerns. The participants conceived as inactive, for example, ask for a widget for contents push service and contents creation wizard. On the other hand, a group of joiners requests features such as contacts management tool- one to may communication method and a profile matching function to meet new people. Critics underscore the level of attention from audiences as important features, which seeks a knowledge network via social network.

2.6 Insight

Extensive research via social, cultural, and technology trend visualizes current landscape of SNSs and help understand general features through definitions and disciplines. In addition, user research clarifies the core needs of target audience

Table 1. An table between activities and six level of participants

	Collect	Relate	Create	Contribute
Creator	Make a record and seek for social contents	Communicate with other people by creator's own contents	n/a	n/a
		Assistance and collaboration between creators.	n/a	n/a
Critic	Approach plenty of information earnestly	Personal networking for pursuing knowledge	n/a	n/a
Collector	Manage dynamic information	Experts pool for dealing with information	Behaviors of seeking for information change every moment	Share what people know (or have been collected) each other
	Seek professional information			Behaviors for successful social communities
Joiner	n/a	Join in a social community and its maintenance	n/a	
Spectator	n/a	SNS is not as important much as their established life style	n/a	n/a
		Take an interest in other people in SN		
Inactive	n/a	n/a	Easier and more simple service is required	Enhance the usefulness on their work (or offline social life) with SNS

concerning SNSs. The syntheses of research have us to strategically select and focus on the 1st and 4th in the quadrant- relations and profile matching (figure 1), because C.E. devices can connect other devices and collect real life based context information via sensor or embedded technologies. The results of overall research can identify the problems toward existing SNSs and new business opportunities in which the future service should move. In next chapter, the present study introduces how concept is being created in terms of problems in existing SNSs.

3 Concept Development

In brief, SNS is being considered as online based people management service and expanding to mobile devices through broadband connections and wireless networking technology. At this moment, the present study states that three challenges to clarify problems and concept of present study in serving core features defined in research conclusion: space, profile, and communication.

3.1 Space

A space means the places where user is able to use and enjoy SNS features. Online SNSs are limited to a space coined web, which limits to support users' nomadic life and diversity of context. Therefore, the present study argues that the space for SNS should encompass devices to manage real life and collect diversity of context with broadband connection and wireless network. A seamless integration of information between features is considered as a very important point once the boundary for SNSs usage is expanded to the CE devices: a resource owing to one must be reused in the other and sync between objects (i.e., online, CE and mobile devices). Information in a contact application existing on mobile device, for example, must be integrated with the one in online SNS.

3.2 Profile

The backbone consists of a profile that displays an articulated list of friends while a wide of SNSs have been presented. The attributes of profile include age, location, interests, and an about me section with photos. In case of facebook, the user allows add applications along with their intentions in the profile page. Most SNSs take the form of profile centric sites, trying to replicate the early success of Friendster or target specific demographics. However, users of most SNSs such as MySpace and Linkin feel hacked for asking fill out forms containing a series of questions. This context of use has users feel frustrated with inputting personal information into proper fields. The present study hypothesizes that the information obtained by collaboration of end-user's devices is much likely to fulfill user's intention or goal along with a diversity of context since the new information built on profile is very tightly related to real life. It concludes much help extend their social network.

3.3 Communication

A social network is described as a social structure made of nodes that are tied by one or more specific types of interdependency as previously cited. It assumes that different groups of people or a people are likely to inhabit as a node at a social structure. Given the situation, having efficient communication methods in a community is assumed to be fairly important no matter what the type of community (i.e., disconnected or onion). In fact, by examining communication log being existed in online SNSs, the users still have old one- one and one- which asks users to do extra efforts to keep track of the communication thread: In the context of SNSs use, novel communication methods being capable of one to many or many to many are assumed to promote proliferation of social network service since it makes faster and convenient communication.

3.4 Conclusion

With combining three key features, the main concept of SNSs with C.E. devices is built, which is likely to expand social network service since it provides additional information dealing with context of use. It allows make real-time flexible community on spot

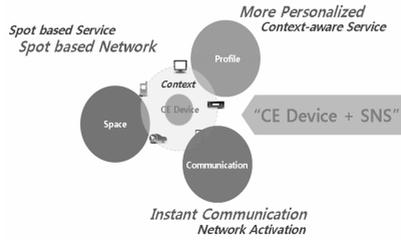


Fig. 4. The Concept of SNSs with CE devices

(location/space) and being used for more personalized service. The figure 4 explains the information built on the device collaborations can describes the user’s context.

The present study argues that SNS with CE devices leans toward context focused social network service that reinforce and maintenance the relations between people: context information, automatically captured by CE devices using GPS and sensors helps people to organize and manage the relationships of people. The key features proposed in the present study are to create, reinforce, and expand the social network given seamless connectivity between online and CE devices.

4 Scenarios

The purpose of scenarios is to prove concept- how proposed concept practically improves user experience dealing with social network. As previously described, the key features in the present study are to create, reinforce, and expand the relationships between people along with the diversity of context. The present study modifies the quadrant, illustrating the community types in which people are located [14], to present context of use obtained by CE devices. The modified quadrant is built according to patterns and behaviors of social network – fix, dynamic, contents sharing (figure 5), which reflects key features of each theme. A family, friend, work group as the fix community is likely to be reinforced via group communication methods, which have them feel being connected. Somewhat new features likewise voting, thread, schedule share are included in the group communication methods. The feature of seamless connectivity enables to share contents without any interrupts between group members

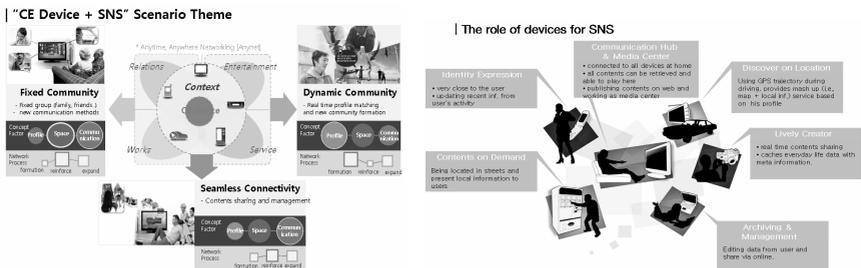


Fig. 5. The Scenario Themes and Role of Devices for SNSs

via RSS technology. For dynamic community, a feature of profile matching is presented, which increase a chance to meet new people based on the goal likewise hobby or business.

References

1. Boyd, d.m., Ellison, N.B.: Social network sites: Definition, history, and scholarship. *Journal of Computer Mediated Communication* 13 (2007)
2. Boyd, d.m.: Friendster and publicly articulated social networks. In: *Proceedings of ACM Conference on Human Factors in Computing Systems*, pp. 1279–1282. ACM Press, New York (2004)
3. comScore.: Social networking goes global. Reston, VA (retrieved September 9, 2007), <http://www.comscore.com/press/release.asp?press=1555>
4. Danyel, F.: Using Egocentric Networks to understand communication. *IEEE Internet computing* (2005)
5. Dickinger, A., Arami, M., Meyer, D.: The role of perceived enjoyment and social norm in the adoption of technology with network externalities. *European Journal of Information Systems* 17, 4–11 (2008)
6. Elderman, J.B.: Distributed Influence: Quantifying the impact of social media, An Edelman White Paper (2007)
7. Fisher, D., Dourish, P.: Social and temporal structures in everyday collaboration. In: *Proc. Conf. Human Factors in computing systems*, pp. 551–558. ACM Press, New York (2004)
8. Fragoso, S.: WTF a crazy Brazilian invasion. In: *Proceedings of CATaC 2006*, pp. 255–274. Murdoch University, Murdoch (2006)
9. Herring, S.C., Paolillo, J.C., Ramos Vielba, I., Kouper, I., Wright, E., Stoerger, S., Scheidt, L.A., Clark, B.: Language networks on LiveJournal. In: *Proceedings of the Fortieth Hawai'i International Conference on System Sciences*. IEEE Press, Los Alamitos (2007)
10. Hsu, W.H., Lancaster, J., Paradesi, M.S.R., Weninger, T.: Structural link analysis from user profiles and friends networks: A feature construction approach. In: *Proceedings of ICWSM 2007*, Boulder, CO, pp. 75–80 (2007)
11. Li, C., Bernoff, J.: *Social technographics Ladder*, from Forrester Research in *Groundswell: Winning in a World Transformed by Social Technologies*. Harvard Business Press (2008)
12. McLeod, D.: QQ Attracting eyeballs. *Financial Mail (South Africa)*, 36 (2006)
13. Kumar, R., Novak, J., Tomkins, A.: Structure and evolution of online social networks. In: *Proceedings of 12th International Conference on Knowledge Discovery in Data Mining*, pp. 611–617. ACM Press, New York (2006)
14. Rhee, R.H., Kiran, P.S., Lee, J.Y., Lee, J.Y.: Media sharing and collaboration within mobile community: Self expression and socialization. In: *Proceedings of the 12th Interactional conference on Human computer Interaction*, Beijing (2005)
15. Shneiderman, B.: Understanding human activities and relationships. *Leonardo's Laptop: Human Needs and the New Computing Technologies*. MIT Press, Cambridge (2002)
16. Skog, D.: Social interaction in virtual communities: The significance of technology. *International Journal of Web Based Communities* 1, 464–474 (2005)
17. Sundén.: *Journal of Material Virtualities*. Peter Lang, New York (2003)
18. Wave.3.: Power to the people social media tracker. Universal McCann. Next Thing Now (2008)