Either Google or your friends, which of them do you believe? : Mobile Social Networking Search

Jong-Sir Oh

Dongseo University
San 69-1 Jurye
Busan, 617-716 South Korea
+82 10 5644 4624
johnsiroh@hotmail.com

ABSTRACT

When we arrive at a strange place and instantly need to gain useful information at where is far from desktop computer, there are two solutions either sending SMS to our friends who live around there or searching via mobile web browser. Although 3G phone makes possible to search via mobile web browser it has a number of constraints such as tiny display, input problem, service price etc. Further web browsing search requires procedural delay which has to select among hyperlinks. In contrast SMS is not only all-pervasive use to mobile users, but also receive the mostly instant feedback from sendee. Fortunately it has well constructed social networking service on the Internet, such as Twitter, Facebook, etc. The conceptual model of social networking search is to build human-knowledge network using these well-structured SNS, rather than web searching engine.

This paper is to examine which is the effective ways for obtaining information through mobile phone between enquiring to neighbor as collective intelligence and the existing search engine. Furthermore it presents how to realise the social networking search on the mobile phone with adequate regime.

Keywords

Mobile Search, Social Networking Service, SMS, Collective Intelligence

INTRODUCTION

Thousands of millions people google everyday to search for information what they need. Although most of these searches are conducted from a personal computer others need to find information when they are far from a desktop. Thanks to mobile technology it is possible to search the desired information via mobile phone which has 3G functionality with web browser. However all users have not 3G phone. So far web browsing on mobile phone is not common use, especially developing countries.

Even though someone uses 3G phone such as iPhone it is hard to obtain the satisfied information from web searching as fast as he/she wants. Hence some portal such as Google provides SMS for their users, which contains the requested information. It can assume that SMS is faster interaction than web searching whatsoever it use mobile phone or desktop. From this assumption this paper presents the possibility for new mobile searching method using social networking service rather than mobile browser.

LITERATURE REVIEW

Today mobile Internet market is rapidly growing up and deeply penetrating into our daily life. According the report SMS text messaging is the most widely used data application on the planet, with 2.4 billion active users, or 74 percent of all mobile phone subscribers sending and receiving text messages on their phones. Whatsoever mobile phone is 2G or 3G SMS functionality has been widely used by users. The advent of 3G mobile leads to adopt mobile Internet service using web browsers such as Google, Android, Safari, i-mode etc.

Approximately 40 percent of the population enjoy access to the Internet via mobile phones in Japan, where user needs have driven developments of the mobile Internet such as 'i-mode'. The number of Internet-enabled mobile phones is over 54 million, which is 77 percent of the total mobile phones as of June in 2002 [1].

As below mention, while mobile Internet use is gradually increasing, SMS still has relative attractive position from a point of pricing which is a crucial factor to users.

World Mobile Statistics

In 2009 half a billion worldwide people accessed mobile Internet. According to the mobiThinking compendium over 85 percent of new handsets will be accessible the mobile web by 2011. Currently the US and EU use an Internet-ready phone, not smartphone. It means that 3G phone is not a unique solution to access the mobile web. Almost one in five global mobile subscribers has access to high-speed mobile Internet services whether he/she has a smartphone or not. International Telecommunication Union reports the number of mobile subscribers approaches 5.3 billion in 2010 which accounts for 77 percent of the world population. Figure 1 illustrates the number of global mobile subscribers in 2010.

Key Global Telecom Indicators for the World Telecommunication Service Sector in 2010									
	Global	Developed nations	Developing nations	Africa	Arab States	Asia & Pacific	CIS	Europe	The Americas
Mobile cellular subscriptions (millions)	5,282	1,436	3,846	333	282	2,649	364	741	880
Per 100 people	76.2%	116.1%	67.6%	41.4%	79.4%	67.8%	131.5%	120.0%	94.1%
Mobile broadband subscriptions (millions)	940	631	309	29	34	278	72	286	226
Per 100 people	13.6%	51.1%	5.4%	3.6%	9.7%	7.1%	25.9%	46.3%	24.2%

Fig. 1 World mobile subscribers from International Telecommunication Union (October 2010)

Above stat generally implies the mobile cellular subscribers lead over the mobile broadband service in spite of the fast growth of 3G. Developing countries show lower mobile broadband penetration than developed nations. The rate of mobile broadband subscription of cellular owners in developing nations is only 8 percent rather than 43 percent in developed countries. Arab states, Asia and Pacific countries, and Africa demonstrate less than 12 percent. It implies that the developing countries hesitate to invest the mobile broadband infrastructure on account of the national cost.

Regardless of the mobile Internet's forte text messaging service is universalised all over the world even developing countries. In 2010 over 6.1 trillion messages had sent all around the world through cellular phones. It is within bounds to say that SMS is still king of mobile messaging. Despite the stunning growth of 3G penetration such as e-mail, twitter, web browsing SMS is preferred by global mobile users and predicted to exceed 10 trillion in 2013.

Use of SMS has not been dented by the popularity of other mobile media such as mobile web, email, applications and mobile social networking services. This staying power and a pervasive tool to send messages are the reason why SMS is still No 1 in mobile marketplace.

Mobile Internet Price versus SMS Price

There are two ways that mobile Internet is priced. Mobile users can utilise 2G networks to access the Internet much like one would use a fixed-line telephone network to dial up. Drawbacks with this approach are slow speeds (e.g., 9.6 kbps for GSM) and much higher prices paid for mobile service compared to fixed-line telephone. The second option for mobile Internet pricing revolves around volume-based schemes operators have introduced with the launching of 2.5 and 3G high-speed networks. Operators generally offer a casual, pay-as-you-go price or different monthly subscription packages based on the volume of data included.

Available data point to growing non-voice mobile usage. Mobile telephone users in the UK sent over 50 million text messages in December 2002, compared to less than 10 million for the same month 3 years earlier.

The growth of mobile Internet may impose a need for regulatory intervention to ensure interoperability of mobile data networks and open access to mobile portals. The use of mobile Internet also impacts the evolution of the information society as a growing number of citizens access web services from mobile telephones. Mobile Internet access could also have important ramifications for numerous countries, particularly many developing nations where there are now more mobile than fixed subscribers.

Even though it is driving the unlimited data regime in the US and Japan, the EU is still holding up progress due to the lack of availability.

Collective Intelligence

Collective intelligence has been one of key themes of Web 2.0 coined by Thimothy O'Reilly. It is largely accepted that more generally crowd sourcing such as Wikipedia representatively, is a novel and efficient way to resolve complex tasks and problems on the network society. Collective intelligence is also very promising way to reduce rising R&D costs [2].

Collective intelligence or swarming is often referred to large voluntary group and its collaboration, for instance to produce software, information such as Wikipedia or problem solution. In such group the participation, the methods and the results are opened, shared and accessible to all, including to those who are not participating [3].

According to Tapscott and Williams, collective intelligence is mass collaboration. In order for this concept to happen, four principles need to exist. These are openness, peering, sharing and acting globally. Openness allows others to share ideas and discussions rather than before a few decade when people and companies even government are reluctant to open their ideas, intellectual property and documents. Peering is a form of horizontal organization with the capacity to create information technology and physical products. Participants in this form of collective intelligence have different motivations for contributing, but the results achieved are for the improvement of a product or service.

In terms of sharing it has been a controversial issue for a long time and so far. Some has allowed them to expand their market and bring out products faster. The advancements in communication technology have prompted the rise of global companies, or e-Commerce that has allowed individuals to set up businesses at low to

almost no overhead costs. The influence of the Internet is widespread. Therefore a globally integrated company would have no geographical boundaries but global connections allowing them to gain access to new markets, ideas and technology [2].

Social Networking Service

Social networking service on the Internet can be defined as Web-based services which allow individuals to compose a user's profile, a list of users with whom they share a connection, and review their list of contracts [4]. In 1980s the bulletin board system (BBS) is considered as the earliest online social network that allowed users post public messages, send and receive private messages, and share resources. It is not a new generation of social networking service until the form of Friendster.com was appeared in 2002. Friendster uses a model of social networking which allows users to invite friends and acquaintances to join their network, unlike previous online social networking communities, which link people with similar interests. MySpace is another social networking service that was launched by a group of musicians for people to share their work in music. However it shortly served that the social networking service cause as becoming a major venue for sharing videos and photos.

Another growing trend is peer-to-peer networking, namely P2P. P2P configuration refers to network of peers using proper information and communications systems, in which two or more individuals are able to communicate spontaneously without any central coordination. Consequently P2P network depends heavily upon computing power at the end of each connection instead of the network itself [5].

Mobile Networking Services

Mobile social networking is a form of social networking where individuals of similar interests or communicates converse and connect with one another using the mobile phone. The nature of mobile phone allow it to be used for social networking service as people routinely carry a mobile phone with it and use it for communications. Here it presents a number of mobile social networking applications. MamJam is a location-based instant messaging platform for mobile phones based in the UK. It uses a system to identify user's location in real time with GSM mobile handsets. Like Mamjam, Rummble is the locative service for mobile phone, which connects people who have similar concerns or topics of conversation. Rummble members can communicate within their postal code. Dodgeball, based on locative service, enables to meet up friends within urban areas where is available in 22 cities in the US. Although Dodgeball is currently free to use users are charged by their mobile carriers for each text message they send and receive through Dodgeball. Dodgeball does not use tracking signals like GPS to determine where its members are. However users must actively inform Dodgeball where they are by sending a text message to Dodgeball with their location [6]. Plazes is a

location-aware interaction system that helps mobile users hook up with friends or other like-minded people anywhere on the globe [7]. In order to match with people within walking distance who have similar interests and want to meet face-to-face Jambo uses Wi-Fi laptops, cellular phones and PDAs. Similarly ProxiDating allows users to meet strangers with common interests in close proximity. It alerts user's mobile phone if matching people are within 15 meters.

Reflecting on above case studies most of popular social networking services are relevant to meeting friends within a radius of permission and reciprocating messages by mobile phones.

RELEVANT RESEARCH

Good Abandonment in Mobile and PC Internet Search

The concept of good abandonment is defined as an abandoned query for which the user's information need was successfully addressed by the search results pages, with no need to click on a result or refine the query. The researchers randomly sampled abandoned queries from Google's PC and mobile search logs from a week in September to October, 2008. They sampled 400 abandoned mobile and 400 abandoned PC queries from Japan (Japanese) and US (English), and 1000 abandoned mobile and 1000 abandoned PC queries from China (Simplified Chinese).

Here researchers classified a query as a potential good abandonment if there is a dominant information need associated with the query that could theoretically be achieved by Internet search engine results page. In terms of likely good abandonment rate it is how often the search engine is providing results that likely results in good abandonment for users, as a subset of the queries that potentially could lead to good abandonment. It is classified as 'Yes' if researchers felt a query's information need was clearly met on the results, 'Maybe' if they were less sure or there was partial information, and 'No' otherwise.
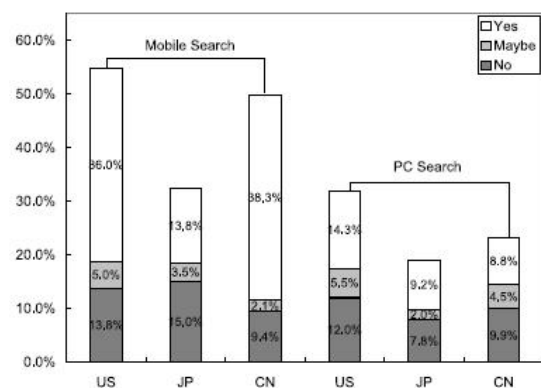

Fig. 2 Percentage of potential good abandonment queries which are classified as Yes/Maybe/No with respect to the likely good abandonment definition (LiJane, HuffmanScott, TokudaAkihito, 2009)

So as to measure the likely good abandonment rate it

examined the actual results page returned by Google, with the purpose of determining whether query's information need is currently met on the search results page.

Fig. 2 shows the search engine is successfully 'answering' a greater proportion of the mobile queries that are potentially answerable on the results page. For PC search an average of 56 percent of potential good abandonments were clearly or possibly met on the results page. For mobile search it illustrates 70 percent. In other words the rate of potential good abandonment is significantly higher for mobile query streams than the PC query streams [8].

Intelligent Mobile Search

Existing search engines suffer from significant coverage and relevance issues with many queries either going unanswered or being answered by misleading result-lists containing irrelevant results.

In addition to these coverage and relevance issues presentation and interface design becomes much more critical in mobile search than in traditional Internet search. For more economic use of limited screen real-estate the alternative approach are studying to search result that satisfies the informativeness of snippet text. The core idea behind this approach is to replace result snippets with a much shorter text representation that is made up of the terms of related queries that have led to the selection of particular result in the past [9]. This trial has been made possible as a direct consequence of community-based personalised meta-search engine called 'I-SPY', which records the queries and search results of different communities of users. Further it provides users with search results that are informed by past search behavior of a community of like-mined users. Specially I-SPY monitors users selections or hits and maintains a record of queries, and result selections [10].

I-SPY maintains a separate profile for different communities of users. For instance searches which originate on a monitoring web site are kept separate from searches that originate from a wildlife web site. This separation of communities allows I-SPY to predict that users of the monitoring web site are more likely to be looking for sports car sites when they enter the query 'jaguar', whilst users of the wildlife site are most likely to be looking for information on large cats for the same query. According to the recent study it shows how I-SPY, working with Google as its underlying search engine, can reduce the percentage of search failure and improve the positioning of relevant results when compared to Google [11].

Mobile Search with Text Messages

The user transmits a query in a text message to the Google SMS short code. Google receives the user's message, parses the query, attempts to retrieve relevant information and sends results back in one or a number of SMS messages. This service aims at supporting searches for specialised information such as business listings, residential listings, product prices, dictionary definitions, zip codes, etc. Despite its convenience it has a number of constraints such as several pages over 160 characters per message, LIFO (Last In First Out) problem of message order, and input technology problem for misspelled query [12].

CONCEPTUAL MODELS

Requirements

Most of mobiles, if not all, should support location-based service. Unless the mobile phone can be recognised its location, he/she has to inform his/her geographical position to information dedicator.

Social networking service on mobile should build up well and organise semi-expert or expert group in various interests. In order to join as a member of social networking search group he/she should go through the form of his/her interests and testify expert knowledge.

Information Provider

As a mediator between sendee and sender it needs to decide who plays a role of 'information provider'. Information provider can be considered as a new player in mobile value chain. The existing network providers may undertake mediated role, but appearance of new player may be expected on the stage. Figure 3 illustrates how the request from user transmits to mobile social network and returns back the response. When user requests the query it transmits either the network provider or information provider. The network provider can become an information provider or not. If the network provider is same as information provider it can be provided mobile social searching service to subscribers pro bono. Unless, the information provider acts as a new business player to both the user and the network provider. It implies new business opportunity for mobile value chain, which is due to scrutinise in the future work.
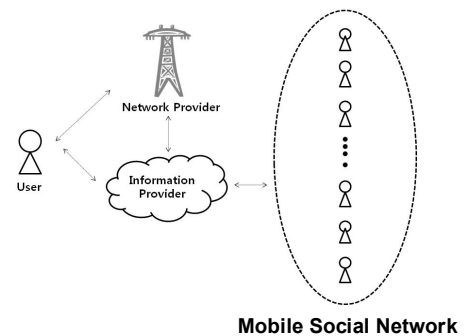

Fig. 3 Information provider as a new player

Public Dedication and Reward Regime

Wikipedia as collective intelligence has been accomplished public dedication for sharing knowledge system without any monetary reward. Users are benefiting by their unrewarded dedication. If someone, who is a semi-expert in specific field as blogger, receives the requested SMS from who needs to obtain useful information, it should proffer some reward to information dedicator.

It can consider as adequate rewards such as the cut-off of mobile cost, free-to-use-SMS, virtual money, mileage save, etc. The pivotal point of mobile social networking search would be how many users congregate into social networking group. In order to induce the active participation the adequate reward regime needs to social network users.

Creditability and Filtering System

According to the report[13] middle and high school students in S. Korea indicates 71 SMS daily use in 2004. Further nine of ten mobile subscribers have used mobile Internet and added services and the most frequent use has been reported SMS. If mobile SNS is well-constructed, someone may receive hundreds of hundreds SMS from information dedicators as well as spam, advertising and unwelcoming SMS. So as to filter unwilling SMS it needs to select and throw received texts. The filtering system depends on the creditability of user in SNS, which can be estimated by receiver with previous dedication whether given information were accurate or not. For more efficient interoperation the estimation should be the user's duty rather than optional procedure.

Acceptable and Unacceptable SMS

In hectic minutes it has rather turn off the function of social networking search than spill over an amount of text messages. It can provide the functionality of SMS-on and SMS–off which permit text messages for request or reject them. This functionality should be considered as optional menu at the stage of mobile manufacturing. Thus the alternative user may power off his/her mobile simply during business hour.

CONCLUSION

As mentioned above social networking search has a great possibility to present more enhanced searching service beyond mobile web search. However it has a number of constraints: privacy infringement, overcrowding, inaccurate information, filtering over unnecessary advertisements, etc. Moreover there are a misspelling and misunderstanding problems due to condensed sentences.

Since 1995 in the US 'classmate.com' has started up as the first social network service in the world, which the people sought their persons known such as alumni even comrade in arms. Indeed social network service is a sort of community web site to share information and construct human network through the Internet. The formal example of social network service is the Facebook or Twitter. The word 'Twitter' has been enthroned as the most influential word in 2009. This megatrend shifts Internet into mobile device.

However, so far, social network service in mobile was mostly relevant to find friends and organizes enthusiastic communities. In this paper it suggests mobile social networking search beyond simple mobile fandom, which is to obtain useful information through SMS rather than Internet mobile service. A number of factors should be considered: price, response time, good abandonment and satisfaction. At the future study it will present the experimental results using by the above factors and usability test which is to examine the degree of MSNS effectiveness between mobile social networking group and mobile Internet group. Furthermore the new value chain network would be implemented by information provider as a new player and whether it is a viable business in mobile marketplace or not, as well as scenario as more crystal concept.

REFERENCES

1. Ishii, K., Internet use via mobile phone in Japan. *Telecommunications Policy*, 2004, 42-45
2. Williams, A. & Tapscott, D., *Wikinomics: How Mass Collaboration Changes Everything*. USA: Penguin Group, 2008
3. Kari, H. A., Intelligence, Web 2.0 and Collective. *MindTrek*. Tampere: Finland., 2008, 163-166
4. Boyd, M. D., & Ellison, B. N., Social Network sites: Definition, history, and scholarship. *Journal of Computer-Mediated Communication, 13-1* , 2007
5. Tsai, F. S., Han, W., & Chua, H. C., Design and development of mobile peer-to-peer social networking application. *Expert Systems with Applications, 36* , 2009, 11070-11087.
6. Lee, H., Mobile Social Networks and Social Practice:A Case Study of Dodgeball. *Journal of Computer-Mediated Communication* , 2008, 341-360.
7. Smith, I., Social-mobile applications. *Computer 38*,4(2005), 84-85.
8. Li, J., Huffman, S. B., & Tokuda, A., Good Abandonment in Mobile and PC Internet Search. *SIGIR'09(* Massachusetts, 2009), ACM, 43-50.
9. Church, K., Smyth, B., & Keane, M. T., Evaluating Interfaces for Intelligent Mobile Search. *W4A at WWW2006* (Edinburgh, 2006), ACM, 69-78
10. Smyth, B., Balfe, E., Freyne, J., Briggs, P., Coyle, M., & Boydell, O., Exploiting Query Repetition & Regularity in an Adaptive Community-based Web Search Engine. *User Modeling and User Adapted Interaction* , 2005, 383-423.
11. Smyth, B., Balfe, E., Freyne, J., Briggs, P., Coyle, M., Boydell, O., et al., A Live-User Evaluation of Collaborative Web Search. *Proceedings of the 19th International Joint Conference on Artificial Intelligence,* IJCAI'05(Edinburgh, 2005), 1419-1424
12. Schusteritsch, R., Rao, S., & Rodden, K., Mobile Search with Text Messages: Designing the User Experience for Google SMS. *Conference on Human Factors In Computing Systems* (Oregon, 2005), 1777-1780
13. Mobile Services, the greatest in number of SMS. Available at http://news.naver.com/main/read.nhn.