Investigating opportunities and obstacles for a community-oriented time accounting social media in Bangladesh

Tunazzina Sultana, Angela Locoro, Federico Cabitza

Dipartimento di Informatica, Sistemistica e Comunicazione
Università degli Studi di Milano-Bicocca
{tunazzina.sultana, angela.locoro, federico.cabitza}@disco.unimib.it

Abstract. This work-in-progress paper presents a survey report that investigates the opportunities and obstacles of a money-free service exchange system on the Bangladeshi urban population that would allow using basic mobile phones, rather than internet-enabled smartphones, to mediate all the necessary online interactions. We investigated the knowledge and the general attitude of people towards these kinds of systems, the technology and culture-related readiness to adopt these patterns of exchange, and the general attitude to join communities of people engaged in such systems. We report the results of a questionnaire-based user study and discuss them.

1   Introduction

While it is well known that social media (including social networking technologies) can trigger the creation of new communities, the so called Web-based or virtual communities e.g., (Hawn, 2009), whose members use the social media to share content, exchange messages and organize both distributed cooperative efforts and social activities like discussions and deliberations (Loader and Mercea, 2011) it is less debated how social media can influence the so called community epimorphism (Jankowski, 2006), i.e., the transformation of a community from a type with some characteristics to another type (e.g., a

community of place or interest into a community of practice) (Qualman, 2010), as well as the impact of these tools in increasing the sense of community of people living in the same area (Wellman et al.,2002).

In this paper, we focus on this latter phenomenon, and we address how even "lightweight" social media, like those accessible from mobile phones with just texting capabilities, could support the positive impact of initiatives aimed at increasing the inner social capital and the wealth of communities of place and of its members as well (Rippin, 2005). In particular, we address the potential of transforming a group of people living in the same urban area of a fast-growing developing country as Bangladesh into a community of people who are bound together by an alternative currency schema like a Time Accounting system (TAS), also known as Time Banking system (TBS).

Time Banking (Bellotti et al., 2014, Seyfang and Smith, 2002, Seyfang, 2004, Marks, 2012; Bellotti et al.,2013) develops a community where people co-produce value and exchange services on an informal and non-monetary basis; in this system time, which is spent for executing the service, is considered as currency. In a typical TBS a user can login to its website to advertise her skills and availability and browse services offered or make a request for a service. Nowadays, this kind of organization is spreading quickly in the developed countries, especially for tackling social exclusion and building neighborhood engagement seen as principal elements of sustainable communities, and for allowing lower-income and unemployed participants to gain social capital (Collom, 2007): in this sense TBS is a grassroots innovation which claims to meet these goals (Seyfang and Smith, 2002).

IT designers and researchers are emphasizing the design requirements of this type of exchange systems, in order to increase the community centered support of IT devices, and mobile technology in particular, for community development and sustainability (Bellotti et al. 2013, Han et al. 2014, Han et al. 2015). Despite many analogies between western countries, which are mostly affected by an unprecedented economic default, and developing countries, which are experiencing an economic growth and an unprecedented social well-being, the adoption of systems like TB in these latter is negligible. We address this general matter in the case of Bangladesh. This South-Asian country has a population of 165 million and, since its independence (in 1971), has increased more than twice, while keeping a 1.3% growth rate. Unfortunately, the 35% of its total population lives below the poverty line; moreover, while unemployment rate is relatively low (4.8%), Bangladesh presents a very high proportion of people, i.e., 40%, who are underemployed, especially women: indeed only 2 workers out of 10 are female. Underemployment, that is the condition where many participants in the labor force work only a few hours a week at low wages, is among the reasons why per capita income as of 2013 is US $1,044, that is quite low compared to the world average ($8,985). In Bangladesh, 6.9% are aged 60 years and over among the total

population and the size and share of the elderly population are increasing over time. It is estimated that the elderly population is going to rise from 6.05% in 1970 to 9.30% by the year 2025 (Hossain, 2005). It is also projected that the growth of the elderly population will be over 200%, going from the current 7 million to over 17 million by 2030. This change in demographic profile is taking place along with many other changes in society, for example modernization, change in family structures (from extended to nuclear type), and urbanization. Moreover, in the urban areas, women's participation in the labor force is increasing which results in a serious problem in the field of elder care and, in general, in family support, due to the changes in social and cultural values (Jesmin and Ingman, 2011). Against this background, and anticipating the fact that such a system could help address the problem of unemployment and underemployment in the younger strata of Bangladeshi population, aid women family time balance and support, involve more and provide care for elder people, we address the following question "Will a TAS initiative be feasible in Bangladesh?" In particular, the main goals of our study were to assess the familiarity and the general attitude of Bangladeshi people with the main logics of service exchange systems like a TAS, to assess their e-readiness (Dada, 2006) towards the adoption of a supporting technology like mobile phones, which are used by almost two third of Bangladeshi population[1], and to detect the technology and culture-related fostering factors or obstacles towards the actual use of mobile based social media to support a service exchange system. In the following section, we discussed the methodology which then followed by results and discussions.

2   The methodology

In May 2014 we undertook a questionnaire-based user study to investigate the attitude of people living in a large urban area in Bangladesh towards potential engagement within a Time Accounting initiative. The main idea was to exploit this fast and relatively inexpensive technique to get a number of themes and indications to further elaborate on and discuss in the exploratory focus groups.

The questionnaire items were initially conceived in English by the authors, and they were then translated in Bengali by one of them who is native speaker; the questionnaire encompassed 40 items whose wording was adapted after two large pilot tests that involved respectively 55 and 221 people and were undertaken in August and December 2013 among the students and faculty members of the University of Chittagong. The preliminary results coming from this pilot phase were used to fine-tune the definitive questionnaire to be administered to a sample

---

[1]   Ministry of Science and Information & Communication Technology, People's Republic of Bangladesh, available at www.btrc.gov.bd, last accessed June 2014

of the Bangladesh population that we wanted to be as random as possible and vast enough to bring representative findings.

The definitive version of the questionnaire was conceived to be completed in approximately 12-15 minutes, in order to minimize fatigue bias and make it suitable for short interviews, either by phone or on the road, as well as for self-interviews, mainly through online forms. In order to maximize the representativity of the results, we adopted the surveying technique of the Computer-Assisted Telephone Interview (CATI, see, e.g., Berg et al., 2004) involving a specialized firm established in Bangladesh that employed local interviewers. These received a brief training on how to ask the questions, how to propose the alternative options to respond the closed-ended items of the questionnaire, how to fill in the electronic forms that we prepared, and also how to possibly clarify some passages and statements in the questionnaire to the interviewees, if necessary.

The CATI phase was then aimed at getting a random sample of respondents from the owners of either landlines phones and mobile phones in Chittagong[2]. Since in doing so the appointed firm had difficulties in reaching elderly respondents (that is respondents older than 64), some interviews were also carried out on the road and the collected responses were later reported on the online forms.

Categorical Variable	Options	Value
Age	Below 25	56%
	Between 25 and 44 years	27%
	Between 45 and 64 years	13%
	Above 65	4%
Gender	Male	50%
	Female	50%
ICT familiarity	Low familiarity	28%
	High Familiarity	72%
Hardware Availability	With hardware	90%
	Without Hardware	10%
Mobile Budget	Below Tk 500 (€5)	43%
	Above Tk 500 (€5)	57%
Employment	Employed	42%
	Unemployed	58%

Table 1. Descriptive Statistics of the Respondents' Characteristics. Percentage values were rounded to the nearest decimal.

In order to keep the margin of error below the conventional threshold of 5%, we completed the collection phase when we got 445 questionnaires. However, at a closer analysis by the authors some of these questionnaires had to be discarded for

---

[2]   Chittagong counts almost 7 million inhabitants, but just 300,000 distinct landlines. For this reason we also contacted a number of mobile phones.

data quality problems, so that we finally got 414 complete cases, associated with a 4.8% margin of error (at a confidence level of 95%). These cases were finally weighted so that their distribution became more similar to that of the urban Bangladesh population with respect to both gender and age, according to the 2011 population and housing census (Bangladesh Bureau of Statistics, Statistics and Informatics Division, Ministry of Planning, Government of Bangladesh). Consequently, in regard to age we got 56% of respondents younger than 26, and 83% younger than 44; only 4% were older than 64, as in Bangladesh official statistics. Table 1 summarizes the categorical variables of our study.

3   Results and Discussion

A very high proportion of respondents (90%) claimed to use at least one digital device connected to the Internet for personal purposes; notably, exactly 2 respondent out of 3 (66%) declared to possess a smart-phone; moreover almost 1 out of 2 respondents (43%) claimed to use both personal computers and a smart-phone. More than 83% respondents have an Internet connection, which is considered fast and reliable enough for their needs, and almost half of them have a flat connection. We evaluated the degree of familiarity with ICT and services accessible through Internet in subjective terms on an ordinal scale, where 1 denotes no familiarity at all, and 6 denotes high familiarity. In this respect, we found that 72% of the respondents declared a good familiarity (i.e., a value greater or equal to 3) and in particular 42% of them chose the highest degree of familiarity. Since ICT familiarity is a precondition for considering the substantiality of TAS system, this could be inferred that Bangladesh has a solid ground or foundation for considering the feasibility of a TAS system in terms of ICT familiarity.

   With respect to the frequency of texting messages, the result showed that texting message is a common practice in Bangladesh. Almost 1 out of 2 of the respondents claimed to text at least one message per day to their contacts, and 1 out of 8 (12%) said to send more than 5 messages per day. This confirms the evidence regarding other uses of mobile phones than simply calling and texting: 76% of smartphone users claimed to use different applications like home banking, weather forecasts and news reading, and an even higher percentage (89%) use a free messaging service (like e.g. Whatsapp, Wechat or Facebook Messenger). These elements are useful to speculate the potentials of a TAS in terms of readiness of the prospective users of an online platform that could put them in communication and mediate information exchange. We also collected information regarding the economic sustainability of a TAS as this system could require that the prospective users exchange more SMSs upon payment or if they use a basic feature mobile phone rather than a smartphone as a tool for using the system. In this regard, we detected that the 43% of the total respondents said that their

budget for mobile phone was less than 500 Bangladeshi Taka (approximately 5€ in 2015) per month. Since, the result did not show any significant correlation between the age and the mobile budget or between the employment status and the mobile budget, this can be inferred that irrespective of their age and employment status people are habituated with texting message and people's income does not have any effect on their text message behavior as text message service is usually considered as one of the cost effective and expressive modes of communication through mobile phone. It was found that the younger respondents (below 25 years) are more frequently texting messages than the other respondents[3], which is more similar to our conjecture that younger are usually more used to texting messages through mobile phones that indicates a probability of the involvement of young people in a TAS system which is mediated through mobile phone's text message service. In connection to the opportunity, the survey result showed that the younger respondents (below 25 years) scored higher, on average, than the other respondents (above 25 years) about the fact that personal relationships or knowing more people personally helped them to get employment[4]. It is intuitive that younger people are in search of a job more than adults; knowing more people personally would help in any way, as for favors that one can get from social networking, which can help to find an employment, and for obtaining an endorsement for a job, and so on. In this regard, the TAS idea can be seen as a way to increase personal acquaintances, to give more visibility to one's own skills and competencies, and also an opportunity to ask availability (i.e., time) to other experts in order to learn from their experiences the essentials secrets of a manual craft or a digital competency. In this connection, the result showed a general belief among the respondents that manual competencies can be acquired much better through imitation rather than with study on written resources[5]. The survey also showed that 75% of the respondents expressed a strong feeling to belong to their community of place (be it the city block or neighborhood), and a clear tendency in the responses was found about a positive attitude in giving help to neighbors[6] or strangers[7], if they needed or asked for it. This existing social capital base is considered as an opportunity for the feasibility of a TAS system since such attitude is a prior need for the success of the system. In addition, we found that respondents with a higher ICT familiarity expressed a stronger willingness to help others[8]. We also found that the respondents trusted friends more than any online

---

[3]   Mann-Whitney Test U (408)= 17304, p<.00

[4]   Mann-Whitney Test U (403)= 16958, P<.01

[5]   Binomial Test (prop .01 vs .99), p=.000

[6]   Binomial test (prop. .98 vs..02), p<.001

[7]   Binomial Test (prop. .65 vs. .35), p<.001

[8]   Mann Whitney test, U(399)= 4563, p=.009

system recommending the abilities and virtues of strangers[9]. This trend is very clear and reasonable in a context where people consider friend as someone from whom they expect help at emergency just after their family members. Notably, we found a general trust in a system where the members were specifically requested to provide a feedback for each interaction occurred within the network, and this feedback were used to build a reputation of each member[10]. Furthermore, with respect to opportunity, the survey result showed that 74% of the sample declared they could join one, if it were established in their community; most notably, this positive attitude was stronger in case of stronger ICT users[11]. In addition, we found that the respondents with high familiarity with ICT scored lower, on average, than the other respondents (low familiarity) about feeling weird or inopportune to claim time credit for having helped a stranger, i.e. the higher the familiarity with ICT, the more positive the attitude towards the core idea of TAS, i.e. towards adopting with exchanging service to strangers[12].This could be explained in terms of a stronger familiarity with a sort of virtual connection that makes whom one is in contact with less "stranger": in a way, who writes emails to someone she does not know, or sees someone as a professional contact of hers on a social network (e.g., LinkedIn), or as either two- or three-grade apart node in her network of acquaintances (e.g., in Facebook or LinkedIn, as friend of a common friend) could perceive a stranger in a different way than people not using those social media or communication tools, perceiving strangers as more connected than those actually are, thus creating a sort of illusion of proximity. This illusion could facilitate the idea of being helped by people that are not known but that yet are members of the same virtual community, as a TAS would be. This means that social media, in creating virtual social networks (on the Web) and sort of virtual (yet weak) ties between its members, could actually foster human social networks, by tearing down the barrier of natural diffidence between strangers. In terms of opportunity, the survey also showed a highly positive attitude of the respondents towards the basic mechanism of TAS like helping others under TAS, describing skills for the system, certifying or confirming the services of others.

In terms of obstacles, the result showed that very few people knew of initiatives of TAS and complementary currencies (96%) or were familiar with these concepts. Moreover, the respondents expressed a significant wariness towards asking for help to strangers for the typical services provided within a TAS, e.g., small errands. The 85% of the respondents from the sample expressed a strong feeling of belonging to a religious community established in their city, i.e., the mosque parish or the temple community; and the result showed a negative

---

[9]   Binomial Test (prop. .89 vs .11), p=.000

[10]   Binomial Test (prop. .59 vs. .41), p=.001

[11]   Mann-Whitney Test U(404)= 3837, p=.001

[12]   Mann-Whitney Test U(400)= 4654, p<.05

correlation (though very weak) between this feeling and the attitude to become a TAS member. The findings indicate that the samples are not only unaware or unfamiliar about technology mediated service exchange system like TAS but also they are uncomfortable about asking help to strangers for the typical services through a TAS. Since these kinds of systems exist in the western countries and are spreading steadily over there, and they are formed basically for mitigating the social exclusion problems in the western society, it is not contrary to our conjecture that the most of the people are unaware about such systems. Moreover, in a society where community feeling is stronger comparing with the western world, it is also not surprising that people might have a moderate attitude towards an unknown system. Hence, we can summarize in Table 2 the opportunities and obstacles that a TAS may encounter in case it is introduced in Bangladesh.

Opportunities	Obstacles
-Connectivity	-Unawareness of system
-Convenience in mobile phone texting	-Wariness to stranger's help
-Younger inclusion	-Religious users untrust
-Social Integration	
-Conformity with TAS transaction	
-Positive attitude to system friendliness	

Table 2. A Summary of the Opportunities and Obstacles Discussion.

4   Conclusions and future work

The initial results of our work indicate that a TAS system is feasible to some extent, as the identified obstacles can be counterbalanced by the opportunities. These findings give us a positive picture of the attitude of the Bangladeshi people towards the idea of a TAS and the degree of their e-readiness towards the adoption of a supporting technology. However, a precise decision on the feasibility of a TAS in a developing country context is depending on further investigation. For example, by grouping the respondents according to different areas and by carrying out a series of focus group discussions, to help us get a deeper understanding of the particular feedbacks, of the key themes, and of the issues of controversy related to the feasibility of a TAS in Bangladesh.

5   Acknowledgments

6 References

Bellotti, V., Cambridge, S., Hoy, K., Shih, P. C., Handalian, L., Han, K., and Carroll, J. (2014): 'Towards community-centered support for peer-to-peer service exchange: rethinking the timebanking metaphor', In *CHI 2014*, pages 2975–2984.

Bellotti, V., Carroll, J. M., and Han, K. (2013): 'Random acts of kindness: The intelligent and context-aware future of reciprocal altruism and community collaboration', In *Procs of CTS 2013*, pages 1–12.

Berg, B. L., Lune, H., and Lune, H. (2004): *Qualitative research methods for the social sciences,* volume 5, Pearson.

Collom, E. (2007): 'The motivations, engagement, satisfaction, outcomes, and demographics of time bank participants: survey findings from a US system', *International Journal of Community Currency Research,* 11:36–83.

Dada, D. (2006): 'E-readiness for developing countries: Moving the focus from the environment to the users', *The Electronic Journal of Information Systems in Developing Countries,* 27.

Han, K., Shih, P. C., Rosson, M. B., and Carroll, J. M.(2014): 'Understanding local community attachment, engagement and social support networks mediated by mobile technology', *Interacting with Computers*, page iwu040.

Han, K, Shih, Patrick C., Bellotti, V., and Carroll, John M. (2015): 'It's time there was an app for that too: A usability study of mobile TimeBanking', *International Journal of Mobile Human-Computer Interaction 01/2015.*

Hawn, C. (2009): 'Take two aspirin and tweet me in the morning: how twitter, facebook, and other social media are reshaping health care', *Health affairs*, 28(2), pages 361–368.

Hossain, M. R. (2005): 'Aging in Bangladesh and its population projections', *Pakistan Journal of Social Sciences,* 3(1):62–67.

Jankowski, N. W. (2006): 'Creating community with media: History, theories and scientific investigations'. *The Handbook of New Media. Sage,* pages 55–74.

Jesmin, S. S. and Ingman, S. R. (2011): 'Social supports for older adults in Bangladesh', *The Journal of Aging in Emerging Economies.*

Loader, B. D. and Mercea, D (2011): 'Networking democracy? social media innovations and participatory politics', *Information, Communication & Society,*14(6):757–769.

Marks, M. B. (2012): 'Time banking service exchange systems: A review of the research and policy and practice implications in support of youth in transition', *Children and Youth Services Review*, 34(7):1230–1236.

Qualman, E. (2010): '*Socialnomics: How social media transforms the way we live and do business*', John Wiley & Sons.

Rippin, H. (2005): 'The mobile phone in everyday life', *Fast Capitalism*, 1(1).

Seyfang, G. (2004): 'Time banks: rewarding community self-help in the inner city?', *Community Development Journal*, 39(1):62–71.

Seyfang, G., & Smith, K. (2002): 'The Time Of Our Lives: Using time banking for neighbourhood renewal and community capacity-building' *(New Economics Foundation, London).*

Wellman, B., Boase, J., and Chen, W. (2002). The networked nature of community: Online and offline. *It & Society*, 1(1):151–165.