Winter 12-6-2018

The Emerging of Smart Citizen Concept under Smart City Environment

Jing Tian

Honglei Li

Rong Chen

Tian, J., Li, H. & Chen, R. (2018). The emerging of smart citizen concept under smart city environment. In *Proceedings of The 18th International Conference on Electronic Business* (pp. 739-742). ICEB, Guilin, China, December 2-6.

The Emerging of Smart Citizen Concept under Smart City Environment

(Work in Progress)

Jing Tian*, Tsinghua University, Beijing, China, tianj.13@sem.tsinghua.edu.cn
Honglei Li, Northumbria University, United Kingdom Honglei.Li@northumbria.ac.uk
Rong Chen, Tsinghua University, Beijing, China, chenr@sem.tsinghua.edu.cn

ABSTRACT

This study proposed a new concept Smart Citizen under smart city environment that has not been noticed before. Smart city has introduced opportunities for improved citizen wellbeing through digitalization of many activities of our life. The information acquisition, shopping, life style tracking, and social life are all shifting from offline to online, which also creates many burdens in our life. Yet we know little about how the life process is being changed by this wave of new technology innovation. Most smart city research focused either on the technology infrastructure or the policy but neglect the most important element of the smart city is the person who lives in the city. A clear definition and examination of the role of citizens under the smart city environment would help us better cope with the technology. This study proposed a new concept smart citizen with four dimensions, followed by several relevant research questions of each dimension respectively. The four dimensions are (1) slacktivism and knowledge bubble, (2) personal digitalization，(3) virtual social relationship, and (4) digital life process burden. We expect to arouse discussions on how an individual under smart city environment shall respond to these four challenging perspectives.

Keywords: Smart city, smart citizen, knowledge bubble, personal digitalization, virtual community, consumer participation

*Corresponding author

INTRODUCTION

Most previous studies on smart city treat the smart city as a macro system, which can be broadly classified into three streams (eg., Neirotti, *et al.* 2014; Nam and Pardo 2011), at the policy level, at the technology infrastructure level, and at the enterprise level. One stream investigated how the government develop policies of establishing smart city. The second stream focused on the technology supports of IT department. The last one paid more attention to enterprise innovation. However, limited studies were conducted on individual level, especially in the citizen's view, who are the basic elements of a city.

As we know, individual behavior has been hugely influenced by technology development, such as information technology, mobile internet, social media, electric business, wearable equipment and so on. Under the smart city environment, life of citizens is not the same as without smart devices before. We can easily get latest news of worldwide, the attendant is knowledge bubble filling up our time. We can track every action or step at all times, but sometimes feel bored with the one defined by numbers. We can contact immediately with anyone on the earth, while we might not talk with a neighbor for several years. We don't need sales people to buy everything online, yet we need to read reviews before and write reviews after consuming, that is, citizens assume responsibility for various work not belonging to themselves. Our life is not same as before, we get not only convenience but also concerns on every aspect. That is why we put forward the concept smart citizen, which should be defined, and the boundaries of smart citizens' life should be clarified.

There is a need for scientific research that explores the consuming behavior and decision mechanism of individual against the background of smart city. We brought up four dimensions of smart citizens, expecting to arouse discussion of how smart citizens' life changed and improve smart citizens' life.

SLACKTIVISM AND KNOWLEDGE BUBBLE

With the development of internet and mobile technology, we have access to the newest and widest information. We can almost "complete" everything on mobile phones: when reading a useful article on Quora, we click "favorite"; when discovering a nice event on Facebook, we click "interested"; when showing supports to a petition, we click "like" on Twitter… Actually, most people will not come back to read the article or participate in the event. After a click, the project seems to be completed. Critics suggest that participating in token support on social platforms may not necessarily lead to a higher likelihood of engaging in more substantial support for the cause in the future, which was named "slacktivism" (Morozov 2009). The moral license effect may explain that people feel they are doing something good to get a moral license, which result in undesirable impact on subsequent prosocial behavior (Khan and Dhar 2007; Kristofferson, White and Peloza 2013).

As we can see, slacktivism exists in our daily life besides prosocial behavior. We are faced not only convenience but also massive information beyond our processing ability. Cost of information seems negligible, while we cannot afford it like an overloading processor. With a click, our brain tells us we have learned the knowledge, we have done the activities, even helped others. Polanyi (1958) classified knowledge to tacit knowledge and explicit knowledge based on its transitivity and expressiveness. Knowledge can be diffused to others through two actions, transmission (more of explicit knowledge) and absorption (more of tacit knowledge)

(Davenport and Prusak 1998). Explicit knowledge can be easier to express and transmit in a large area, while tacit knowledge is formed and absorbed by oneself in specific context, more difficult to express and transmit (Dixon, 2000). Nonaka and Takeuchi (1995) proposed a dynamic theory of organizational knowledge creation including four transferring modes of tacit and explicit knowledge, that are socialization, externalization, combination and internalization. Internalization is the process from explicit knowledge to tacit knowledge, individuals internalize from system study and experience accumulation, which relates closely to action (Nanoka and Tadeuchi 1995). Kakabadse *et al.* (2003) summarized a knowledge chain: data→ information→ cognition→ action→ wisdom. Without action, knowledge will not transform into wisdom. Dodd and White (1980) gave the three elements of cognition, refers information processing in certain psychology construct for certain purpose. Only with purpose, individual can make strategy and reaction based on reality, then knowledge can be activated and absorbed.

Overloading of information limits our time input to each task, the schedule is fragmented. We receive knowledge from multi resource without purpose, relevance, the explicit knowledge cannot be internalized and absorbed without action, which are facial and less efficient. We propose the learning mode is no longer through real action but only through thought, which is transmit faster and easier, but stay on surface layer. Just like speculating real estate, people create GDP through buying and selling properties without creating real value，called Real Estate Bubble. We think the underlying mechanism of slacktivism is knowledge separate from reality, that is the knowledge bubble. Across this context, a number of questions emerge:

- What is the relationship between practical action and slacktivity?
- Is slacktivism always undesirable for knowledge obtaining?
- How to solute the negative influence of knowledge bubble?
- How to define the knowledge boundary aligning with reality of smart citizens?

PERSONAL DIGITALIZATION

Increasing costs and concerns about health contributed to consumers' pursuit of healthy lifestyles, which has been supported by the quantified self-movement. With the emergence and promotion of smart Apps such as Nike +, FitBit, as well as corresponding wearable quantified equipment, more and more consumers are involved in quantifying themselves, monitoring their activities and health status (Haddadi *et al.* 2015). Digital technology and quantified equipment help consumers collect data of daily activity and physiological status, which guide them understand and improve their behavior about health, ecology, work and consume. The health apps record our steps, exercise and calories consuming (Moore and Robinson 2016). The efficiency apps record our working time and entertaining time. We can sign the location when we travel to a scenic spot or a famous restaurant. Every individual can be defined by the quantitative data of location, recordings. The age of quantified self driven by data is coming (Etkin 2016).

However, the progress of digitalization technology goes further beyond our understanding of consumer's reaction to quantified self. Almalki, Gray and Martin-Sanchez (2016) defined the concept of quantified self, individuals use quantified equipment to collect, manage, reflect themselves, so as to better understand their health condition and behavior, and better interact with environment. Self tracking may arouse self cognition of individuals and influence their attitude and behavior (Marcengo and Rapp 2014). Cadsby, Song and Tapon (2007) found external incentive promote individuals' performance in quantified activity. Spence, *et al.* (2009) further pointed out merely quantification without external incentive will stimulate better performance through highlighting value of activity. The factors of quantified self effect still need exploration and empirical research.

Based on the intrinsic motivation theory, when individuals participate in an activity for some incentive besides task accomplishment, their behavior are driven by external motivation; while participate for some characteristic of task, they are driven by internal motivation (Remedios, Ritchie and Lieberman 2005). The internal motivation higher, the more happiness and interest individuals will feel. The related ego/task involvement explored motivation from individual themselves. Decharms (1968) found that task-orientation instruction will guide participants to pay attention to task itself and more devoted, while ego-orienting instruction drags their attention to evaluation of outside world and feel less autonomy and more pressure from task. As personal digitalization will help us and others evaluate our performance, we wonder if it will externalize our internal motivation and let down the achievement. According to goal setting theory (Butler 1988), the type of goal (mastery goal vs. performance goal), clarity of goal (clear goal vs. ambiguous goal) and difficulty of goal (easy vs. challenging) of the quantified activity will influence our goal accomplishment and performance. We propose it depends on the gap between goal and reality, self efficiency and self esteem. Research questions may include the following:

- Does personal digitalization results in external or internal incentive? Will digitalization activity externalize the internal motivation and reduce happiness?
- Will personal digitalization contribute to goal completing?
- How to set appropriate goals for personal digitalization?
- Will personal digitalization result in happiness? We may find some boundary conditions such as activity type, when the activity is desirable, digitalization itself may decrease the original happiness.

VIRTUAL SOCIAL RELATIONSHIP

Instant chatting and video call applications allow us communicating anytime and anywhere. We don't have to meet each other

face to face. It seems that virtual social reduces the distance between citizens. Most researchers are of the opinion that virtual communities offer better functions and values than real communities (Li 2004). Etzioni and Etzioni (1999) argued that virtual communities provide, sometimes better, functions of real communities, particularly in social relationship building. By investigating members in a chat room, Coon (1998) was among the first to suggest that virtual communities resemble real communities and that people can form communal relationship through computer-mediated communication (CMC) on the Internet. Fox and Roberts (1999) also supported that the existence of virtual community in a medical practitioner electronic forum and further suggested that virtual communities should be the extension of real communities instead of completely replacing them. Bakardjieva (2003) pointed out that virtual communities could satisfy people's various everyday-life needs.

On the other hand, as virtual social taking more of our life, even occupying the time of talking with the people around us, the distance between citizens seems to become further. Anderson (2000) argued that virtual communities decrease people's real social interactions and are detrimental to people's relationship building in real life. We propose the link strength moderate the influence of virtual social on distance, that is the distance between weak link individuals become closer, while between strong link individuals become further. Smart citizens' social behavior in virtual and real communities ought to be discussed under smart city environment, giving rise to the following questions:

- Does the psychology distance between citizens become closer or further under smart city environment?
- What influences the psychology distance between smart citizens?
- How to balance the virtual social and practical social?
- How to break invisible walls between smart citizens in practical community?

DIGITAL LIFE PROCESS BURDEN

Smart cities make it possible for consumers to serve themselves, which are the responsibilities of officers or service people before. Citizens can deal with application online, consumers can shop and pay online, or shop offline and pay through the self check-out. Our city is getting flatter and much more efficient with consumers' participation. Consumer participation is the involvement in service producing and delivering, including passively involved in service or initiatively cooperation (Dabholkar 1990). Bettencourt (1997) supported that consumer participation was positively correlated with perceived service quality because of their own efforts.

But conflict exists in the relation of consumer participation and satisfaction, Bendapudi and Leone (2003) pointed out that self-serving bias would influence consumers' satisfaction attribution, they might attribute good result to themselves while bad results to others. In smart cities, citizens may not volunteer to participate service but have no choice with less human service. How to increase citizens' participation willingness and satisfaction is to be considered. At the same time, we have to spend more time on general affairs not belonging to us, which bring us additional burden and disturb our own duties. Many studies pay attention to alignment between IT system and business strategy (Chan and Reich 2007), however alignment between city plan and individual life process has not been discussed seriously. Research questions may include the following:

- How to increase citizens' participation willingness in city service?
- How can we increase their perceived autonomy and satisfaction?
- How to reach alignment between city plan and individual life process so as not to bring extra burden to citizens?

In the future, we are interested in the influence of individual behavior on smart city building. What kind of individual personalities or activities will contribute to smart city forming? How to promote consumers to use the facilities, products with smart attributes?

ACKNOWLEDGEMENT

This work was supported by the National Natural Science Foundation of China [grant numbers 71472104,71772104]; Tsinghua University Initiative Scientific Research Program (20151080390).

REFERENCES

[1] Almalki, M., Gray, K., & Martin-Sanchez, F. (2016). Activity theory as a theoretical framework for health self-quantification: a systematic review of empirical studies. Journal of medical Internet research, 18(5).
[2] Anderson, T. C. (2000) The Body and Communities in Cyberspace: a Marcellian Analysis, Ethics and Information Technology, 2, 153-158.
[3] Bakardjieva, M. (2003). Virtual togetherness: an everyday-life perspective. Media, culture & society, 25(3), 291-313.
[4] Bendapudi, N., & Leone, R. P. (2003). Psychological implications of customer participation in co-production. Journal of marketing, 67(1), 14-28.
[5] Bettencourt, L. A. (1997). Customer voluntary performance: Customers as partners in service delivery. Journal of retailing, 73(3), 383-406.
[6] Butler, R. (1988). Enhancing and undermining intrinsic motivation: The effects of task-involving and ego-involving evaluation on interest and performance. British journal of educational psychology, 58(1), 1-14.
[7] Cadsby, C. B., Song, F., & Tapon, F. (2007). Sorting and incentive effects of pay for performance: An experimental investigation. Academy of management journal, 50(2), 387-405.
[8] Chan, Y. E., & Reich, B. H. (2007). IT alignment: what have we learned? Journal of Information technology, 22(4), 297-

315.
[9] Coon, D. A. (1998) An Investigation of #friends Internet Relay Chat as a Community, Unpublished Master Dissertation, Kansas State University, Available at: http://www.davidcoon.com/thesis.wpd, Accessed May 29, 2003.
[10] Davenport, T. H., & Prusak, L. (1998). Working knowledge: How organizations manage what they know. Harvard Business Press.
[11] DeCharms, R. Personal causation: The internal affective determinants of behavior. 1968.
[12] Dixon, N. M. (2000). Common knowledge: How companies thrive by sharing what they know. Harvard Business School Press.
[13] Dodd D. H., White R M. Cognition, mental structures and processes[M]. Allyn & Bacon, 1980.
[14] Dabholkar, P. A. (2015). How to improve perceived service quality by increasing customer participation. In Proceedings of the 1990 academy of marketing science (AMS) annual conference (pp. 483-487). Springer, Cham.
[15] Etkin, J. (2016). The hidden cost of personal quantification. Journal of Consumer Research, 42(6), 967-984.
[16] Etzioni, A. and Etzioni, O. (1999) Face-to-Face and Computer-Mediated Communities, A Comparative Analysis, The Information Society, 15, 241-248.
[17] Fox, N., & Roberts, C. (1999). GPs in cyberspace: the sociology of a 'virtual community'. The Sociological Review, 47(4), 643-671.
[18] Haddadi, H., Ofli, F., Mejova, Y., Weber, I., & Srivastava, J. (2015, October). 360-degree quantified self. In Healthcare Informatics (ICHI), 2015 International Conference on (pp. 587-592). IEEE.
[19] Kakabadse, N. K., Kakabadse, A., & Kouzmin, A. (2003). Reviewing the knowledge management literature: towards a taxonomy. Journal of knowledge management, 7(4), 75-91.
[20] Khan, U., & Dhar, R. (2007). Where there is a way, is there a will? The effect of future choices on self-control. Journal of Experimental Psychology: General, 136(2), 277.
[21] Kristofferson, K., White, K., & Peloza, J. (2013). The nature of slacktivism: How the social observability of an initial act of token support affects subsequent prosocial action. Journal of Consumer Research, 40(6), 1149-1166.
[22] Li, H. (2004). Virtual community studies: A literature review, synthesis and research agenda. AMCIS 2004 Proceedings, 324.
[23] Morozov, E. (2009). The brave new world of slacktivism. Foreign Policy, 19(05).
[24] Moore, P., & Robinson, A. (2016). The quantified self: What counts in the neoliberal workplace. new media & society, 18(11), 2774-2792.
[25] Marcengo, A., & Rapp, A. (2014). Visualization of human behavior data: the quantified self. Innovative approaches of data visualization and visual analytics, 1, 236-265.
[26] Nam, T., & Pardo, T. A. (2011, June). Conceptualizing smart city with dimensions of technology, people, and institutions. In Proceedings of the 12th annual international digital government research conference: digital government innovation in challenging times (pp. 282-291). ACM.
[27] Neirotti, P., De Marco, A., Cagliano, A. C., Mangano, G., & Scorrano, F. (2014). Current trends in Smart City initiatives: Some stylised facts. Cities, 38, 25-36.
[28] Nonaka, I., & Takeuchi, H. (1995). The knowledge-creating company: How Japanese companies create the dynamics of innovation. Oxford university press.
[29] Remedios, R., Ritchie, K., & Lieberman, D. A. (2005). I used to like it but now I don't: The effect of the transfer test in Northern Ireland on pupils' intrinsic motivation. British Journal of Educational Psychology, 75(3), 435-452.
[30] Spence, J. C., Burgess, J., Rodgers, W., & Murray, T. (2009). Effect of pretesting on intentions and behaviour: A pedometer and walking intervention. Psychology and Health, 24(7), 777-789.
(*Full reference list is available upon request from the corresponding author.)