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A Study of Knowledge Sharing in Sustainable City Development with Www.oursus.org as Action Research

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Abstract: With the emergence of the mass collaboration paradigm along with the rapid development of Internet Communication Technologies (ICTs), the wide acceptance of mass collaboration is inevitable with its irresistible advantages in transmitting, sharing and integrating knowledge among participants. In this context, initiatives in creating practical and sustainable knowledge networks are highly desired. As an explorative initiative supported by the International Geographical Union (IGU), www.oursus.org with its Chinese and English-version websites, a Global Sustainable Development Cities Information Network (IGU-GSCIN), was put forward in 2010 adopting a so-called rainbow knowledge category approach, task modules for different role participants and the most popular ICTs, such as social networks and location-based systems. Taking an action research approach, we believe that it is quite possible for this kind of website to develop as a multi-dimensional knowledge network for global sustainable cities which includes products with sustainable features provided by enterprises, cases and problem observation by NGOs and experts, experience exchange by individuals, campaigns by volunteers, etc.

Key words: Sustainable city, environmental communication, community of practice, internet-based mass collaboration, cybergeography

INTRODUCTION

Urbanization can be regarded as unavoidable and a viable national strategy with populations ever more becoming concentrated in urban centres, especially in developing countries, while restrictions in terms of resources and environment challenge the course of transformation into sustainable cities. Extensive research has been done to define and assess sustainable cities rather than to develop sustainable cities in a non-defined and non-procedural manner (Khare *et al*., 2011). As a result, sustainable cities are understood and advocated by geographers, city planners and political leaders. However, the general public or the enterprises, on the other hand, often have no know-how pertaining to the design or shaping of sustainable cities in local action (Portney, 2005). This can be attributed to inadequate acquaintance with and awareness of the concept of sustainable cities. In addition, sustainable development itself is based on a specific perspective with a collaborative objective (Dietz *et al*., 2003). If there is no appropriate collaboration platform, the constraints in information and costs, required for collective action, cannot therefore be overcome. Internet development provides the technology and social capital platform for active public participation in knowledge exchange and for advertising sustainable cities (Estevez and Janowski, 2013). Even more researchers believe that Internet-based communication is an important part of the solution to the existing environmental issues, especially those relying on global collaboration (O'Brien, 2012; Zhao *et al.,* 2013). Based on action research of the design, structure and operation of a sustainable cities knowledge network, supported by the International Geographical Union (IGU), we provide an exploratory study on knowledge sharing and action promotion directed towards mass collaboration during the development of sustainable cities.

REVIEW AND RESEARCH FRAMEWORK

Review: It is mass collaboration time with Internet Technology Communication (ITC) development and collective action outbreaks across traditional boundaries in many parts of the world. To deal with the most complicated global problems such as climate change and resource degradation, sustainable development solutions become promising when they are based on mass collaboration (Williams and Tapscott, 2006). Knowledge

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networking is an important prerequisite for the success of mass collaboration, in which knowledge is transmitted, shared and integrated among participants to inspire innovative products and services. Knowledge networking is defined by three aspects from the perspectives of components and functions such as: (1) To signify a number of people, resources and relationships among them, who are assembled in order to accumulate and use knowledge primarily by means of knowledge creation and transfer processes, for the purpose of creating value; (2) The purpose of knowledge networking is to accumulate and use knowledge; and (3) The components of knowledge include actors, resources and relationships. The three can create values only when they interact with each other in the process of creation and transfer (Seufert *et al*.,1999).

The evolution of a knowledge network is affected by numerous factors (McLure-Wasko and Faraj, 2005; Coleman *et al*., 2009; Allee, 2000). Firstly, knowledge evolution is highly connected with the characteristics of the whole cluster, a large number of participants with an attitude towards knowledge sharing and a culture background rendered by this characteristics and attitude. Secondly, the evolution of a knowledge network is influenced by the stability of participants as a group, trust etc.

Further, the above factors of preference, trust and stability, are influenced by three aspects at an operational level (Viegas *et al*.,2 007): Task granularity in collaboration, a stable collaboration platform and informal opinion leadership. Task granularity is based on high modular division which reflects the scale of each module and influences the participants' involvement in decision making. If knowledge, according to the modularity-based task granularity, is divided into sub-knowledge about components and modules, knowledge contributors are authorized to independently select time and content. The participants thereby exhibit great autonomy and flexibility in selecting property, degree and time of knowledge activities. For instance, Wikipedia has knowledge granularity refined by global individuals which keeps their content rich and updated (Flock and Rodchenko, 2012). A collaboration platform focuses on the construction of a new low-cost centre for cooperation so that stability is ensured and trust accumulated while transiting and sharing knowledge. Opinion leaders are active media users who provide information, ideas and suggestions to lower-end media users, thus exerting influence on them. They are held in high esteem by those who follow their opinions and advice.

Research framework: In sustainable city development, a fully developed Internet infrastructure and mass collaboration, via an Internet application, are together responsible for forming and progressing the knowledge network. With this as the foundation, collective action with a common understanding is likely to occur. The main body of the sustainable city network comprises of individuals who are aware of environmental protection returns, enterprises, research institutes as well as teaching organizations engaged in sustainable city undertakings and Non-Governmental Organizations (NGOs) dedicated to environmental campaigns. They promote each other's agendas and usually have mutual goals. For example, a leading enterprise committed to sustainable development benefits from citizens (consumers) with a high awareness towards sustainability, so as to achieve expansion of a benign market in an economical way. On the other hand, citizens get influenced by popularization, sustainability education and voluntary activities. In view of its evolution, a knowledge network for sustainable cities must take into account the attitude towards sharing and the cultural background of the participants.

The task module of knowledge networking in sustainable development must first be based on classification of knowledge into various fields. Diversified fields in sustainable development require distribution and iteration of information among different knowledge owners. It is safe to assume that most specialists, professionals, specialized agencies and enterprises, who have mastered the classified structured knowledge, are more suited for tasks with larger granularity in their own fields, whereas the public, who have formed a preference for environmental protection, is more suitable for tasks with a smaller granularity. But whether the task models are, the relative small task allocation principle should be adopted, because if participants accomplish a task that is small enough in expected time and with projected work, they will be driven by their fondness to contribute to environmental protection. However, if the task requires a lot of time, great efforts and larger contribution, participants are likely to reduce their potential input.

The construction of a sustainable city knowledge network is an effective utilization of information technology. The pictures, videos and stories on sustainable cities available online have become a global public shared resource and can be incorporated into any knowledge network. Without the boundaries of time and space, a knowledge network makes the global participants more intertwined and encourages knowledge owners to jointly create products, services and collaborative actions. It not only supports mutual learning, imitation, practices, understanding as well as implementation, but is also expected to enforce the "emergency of system" to achieve action promotion.

ACTION RESEARCH

International Geographical Union (IGU) is an international geographical society with 90 years history. The Union has 34 Commissions which range from Applied Geography, Gender Geography, Marine Geography, as well as Landscape Analysis and Water Sustainability. With the great urbanization around the world, the IGU hopes their members to contribute to the development of sustainable cities. A sustainable cities knowledge-sharing network is expected to contribute to sharing of knowledge regarding improving the quality of life and the environment within global cities. It can help encourage the general public, geography practitioners, enterprises and the government to take actions together so as to try and resolve social and economic problems to a greater extent resulting from worsening environmental conditions in the course of development. It can serve as a mass communication bridge connecting companies and agencies worldwide to share cases and products possessing sustainable features so that they learn from each other. It also can promote the realization of a smooth collaboration between enterprises or agencies and governments at different levels, among enterprises or agencies and even among cities globally to realize a win-win situation. Thus, a website, named oursus.org which is abbreviated from our sustainable cities, has been designed and run as a pilot. The project can be seen as 'action research'. Similar cities consist of different communities of practice (cops) locally with interaction globally. Different stakeholders can take collaborative action on the same virtual platform and everyone can potentially benefit in terms of incentive compatibility principle.

www.oursus.org design: Individual efforts in research, innovation, monitoring and assessment clearly can contribute to sustainability, while the full utility of such independent contributions depends on developing integrated knowledge systems. We designed a content framework which we called the rainbow approach adhering to the following principles:

- An interactive online interface in order to have a strong and colorful appeal to all viewers. A rainbow framework (See oursus.org homepage) can play such a role: it shows many different aspects and at the same time it shows that all elements are part of something bigger and something that shows unity in diversity
- Helpful with a convenient tag system of online key words search for corresponding sustainability fields A rainbow can make the function better realized
- Conforming to the project's vision by ensuring that all sustainability fields are explored and given attention

There are some important strategies according to pro-environmental advocacy, such as focus more on values and less on science, share cases and experiences, work together and build a culture of learning. Meanwhile, philanthropy must empower experimentation and incentivize knowledge sharing (Luers 2013). Thus we analyzed the possible participants and their positive contribution; which could be the main 'columns' in the website.

ITC develops quickly and the mass collaboration systems are also evolving. It is thought that allocation-based system, open access system and social network system are the basic and most important support systems to mass collaboration in the current era. We use these systems to attract users with open access, allow a relatively local conception and cultural specificity: a locally grounded environmentally aware community with social network evolvement

Outcome of knowledge sharing: The website started in October, 2010 with design, coding and the fundamental information building. It was announced on operation since August, 2012 at the IGU Congress in Cologne. There is over one year experience with knowledge sharing at both the international leve l(English language) and with the Chinese version (Chinese language). During this period, we have included 760 cases; have got 643 active users, 453 products, 1117 cases, 2005 challenges and 5363 experiences. 83 cities were located and tagged by different knowledge items. And 19 special reports were produced as a form of integrated knowledge exhibition and communication (Table 1).

As for the participation situation, the Chinese website has had 50,638 hits in total and 1,984 hits as the highest hits one day; the English website has had 30,589 hits in total and 1,784 hits as the highest per day, in the past 11 months from August 23, 2012 to July 23, 2013. There have been 5,694 Independent visitors to theChinese version and 3,893 to the English version. Among the above hits and independent participants, part of the contributions are from the websites' information volunteers. We have had 41 volunteers sharing their knowledge; among them are 16 English-language volunteers and 25 Chinese-language volunteers, both of those mostly from Hunan University with different study backgrounds (part of them geographers). They act as communities of practice, separately responsible for two language websites but they communicate and learn mutually. The group meets

Table 1: Outcome of knowledge sharing from August, 2012 to June, 2013

Columns	International version	Chinese version	Total
Products	293	160	453
Cases	760	357	1117
Challenges	200	1805	2005
Campaigns	73	120	193
Users	204	439	643
Experiences	1247	4116	5363
Cities	23	60	83
Special reports	4	15	19

once a week to discuss week plans and to review their work for the past week. Once the knowledge has accumulated enough on one issue such as "waste reuse in household", volunteers will design a special issue for it; and they will integrate all kinds of knowledge on experiences, cases, products, problems and actions. Then they will popularize it by all online ways to mobilize companies, experts and NGOs to join oursus.org.

In order to know new visitors and their behavior, we have analyzed the one month statistics of both language versions date from 24th June to 23th July, 2013 by a professional analytics tool and got the following findings. In the past month, we had more than 50% new users and most of them visited more than one page. Some even visited over 10 pages which means that people are interested in the websites. Besides, data shows that about 80% of the visitors logged in the websites directly or transferred from igu-online.org, about 20% transferred from search engines like baidu.com and google.com.

We can conclude that the websites with the two languages are somehow progressing: we have raised at least two communities of practice, although the participants are mostly from Chinese universities and work as information volunteers. By the information volunteers' endeavor, we have 643 registered users on the websites and 9,587 independent visitors together have visited the two websites and hundreds of different knowledge items have been contributed. Although we can't define the other independent visitors as NGOs, companies, or other agencies and we don't know much about them and the aspired situation with huge numbers of participants online didn't appear yet, we believe that the framework and the work mechanism of the websites is working and promising.

DISCUSSION AND PROSPECTS

We have taken almost three years from an idea to the websites' actual operation, in accordance with the cycle of action research. Now we think we have finished the first action cycle. In this cycle, we noticed that internet technologies can help us to solve problems and will be the "mass collaboration way" to sustainable cities development. We investigated online websites about sustainable cities and put forward our ideas to represent the various aspects of sustainable city development with our 'rainbow' framework, different task modules and technical support systems. We believe that the knowledge-sharing on sustainable cities can improve people's awareness, build up communities of practice and even promote actions after reflecting the outcome of the websites.

Action research is a long process especially for this kind of knowledge network. After the first cycle, we realized that there still are many problems, such as: There are only two CoPs developed by ourselves, few enterprises and NGOs positively participate in our website, some leaders who are invited are willing to do so in principle, but often lack the time to really engage How to stimulate that independent visitors become the websites' loyal customers and how to attract the real users of the websites are the critical themes for the next action research phase. We will revise our action plan; adopt more measures such as social media communication; IGU international network resources mobilization; website technical improvement, etc., then implement the action steps, collect data to monitor change, analyze and evaluate. What is important now is that more enterprises and agencies put their best practices online by making use of the oursus.org website (the 'advertisement section' for products and cases) and that professional experts (hopefully many geographers and coming from the whole world) will actively evaluate these best practices, new products and novel ideas (and upgrade them from the 'advertisement' to the 'sustainable products and cases' section). If that can also generate income (payment or sponsorship) for the website (and for IGU, as the original intention was) we can then move to the third cycle: a mainly self-sustaining system with little involvement of the initiators.

If we succeed, we have contributed to sustainable cities and to global information sharing about 'our sustainable cities'. If we succeed to involve a lot of geographers, from all over the planet, we have also contributed to make geography a truly cyber spatial action science and put that scientific discipline in the center of the global attempts to create better cities and environmental sustainability. Geographers can do so. But will they go beyond their comfort zones?

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REFERENCES

Allee, V., 2000. Knowledge networks and communities of practice. OD Practitioner, 32: 1-15.

Coleman, D.J., Y. Georgiadou and J. Labonte, 2009. Volunteered Geographic Information: The nature and motivation of produsers. Int. J. Spatial Data Infrastructures Res., 4: 332-358.

Dietz, T., E. Ostrom and P.C. Stern, 2003. The struggle to govern the commons. Science, 302: 907-1912.

Estevez, E. and T. Janowski, 2013. Electronic Governance for sustainable development: Conceptual framework and state of research. Govt. Info. Q., 30: S94-S109.

Flock, F. and A. Rodchenko, 2012. Whose article is it anyway?-Detecting authorship distribution in wikipedia articles over time with WIKIGINI. Proceedings of the Wikipedia Academy, July, 2012. http://www.aifb.kit.edu/web/Inproceedings3283.

Khare, A., T. Beckman and N. Crouse, 2011. Cities addressing climate change: Introducing a tripartite model for sustainable partnership. Sustainable Cities Soc., 1: 227-235.

Luers, A., 2013. Rethinking US climate advocacy. Climatic Change, 20: 13-19.

McLure-Wasko, M. and S. Faraj, 2005. Why should I share? Examining social capital and knowledge contribution in electronic networks of practice. MIS Q., 29: 35-57.

O'Brien, K., 2012. Global environmental change III: Closing the gap between knowledge and action. Prog. Human Geogr., 10.1177/0309132512469589

Portney, K., 2005. Civic engagement and sustainable cities in the United States. Public Administration Rev., 65: 579-591.

Seufert, A., G. von Krogh and A. Bach, 1999. Towards knowledge networking. J. Knowl. Manage., 3: 180-190.

Viegas, F.B., M. Wattenberg and M.M. McKeon, 2007. The Hidden Order of Wikipedia. In: Online Communities and Social Computing, Schuler, D. (Ed.). Springer, Berlin, Heidelberg, ISBN: 978-3-540-73256-3, pp: 445-454.

Williams, A.D. and D. Tapscott, 2006. Wikinomics: How Mass Collaboration Changes Everything. Portfolio, New York, pp: 124-150.

Zhao, J., X. Zheng, R. Dong and G. Shao, 2013. The planning, construction and management toward sustainable cities in China needs the environmental internet of things. Int. J. Sustainable Dev. World Ecol., 20: 195-198.