Digital 21 Strategy and EIAs in Hong Kong

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Abstract
Assessment of environmental impacts can involve a large volume of data and information, from the collection, collation, analysis to visualization. At different stages of a project, the requirements on how data are managed vary. In Hong Kong, the Digital 21 Strategy sets out the blue print for Information and Communications Technology (ICT) development. With the advent of wireless and multi-platform technologies, cloud computing and big data analytics, there have been significant progresses in enhancing efficiency and improving stakeholder communications through the EIA processes. This paper presents the latest trends of how new ICTs are leveraged in EIAs so as to achieve the goal of "Smarter Hong Kong, Smarter Living".

1. Introduction

According to Gartner's recent report (2015), ten strategic technology trends will have significant impact on how organizations, governments, and people evolve in the near future. These technology trends include 'computer everywhere', 'the Internet of Things', '3D printing', 'advanced, pervasive, and invisible analytics', 'context-rich systems', 'smart machines', cloud/client computing', 'software-defined applications and infrastructure', 'Web-scale IT', and 'risk-based security and self-protection'. The trends basically cover three themes; namely the merging of the real and virtual worlds, the advent of intelligence everywhere, and the impact of digital technology on human life. Among these trends, 'computing everywhere' was ranked first that predicts an increased emphasis on serving the needs of the mobile users in diverse contexts and environments (as opposed to focusing on devices only), particularly user experience design to be a key feature in future IT development and deployment. In developed nations such as the US, European countries, Australia, South Korea and Singapore, and cities such as Shanghai and Hong Kong, mobile computing and 'computer everywhere' can enhance the accessibility and usability of data and information for public information collection, collation, and dissemination. Mobile computing and computer everywhere can also enable public consultation, participation, and engagement. In fact, the fluid and dynamic communication between different parties including government departments, private enterprises, and all other stakeholders is a real challenge, no matter the issues involving economic, social, environmental, and/or political aspects. Effective communication can build consensus and mutual agreement (Pieterson et al., 2007) while ineffective communication leads to misunderstanding, conflicts, and even upheavals (Khamis, 2011).

Lo et al., (2014), Leung et al. (2014), and To and Chung (2014) explored public participation and engagement in environmental impact assessment (EIA) in Hong Kong. Using two rail projects as examples in Hong Kong, Lo et al. (2014) reported that traditional consultation methods such as newsletters, roving exhibitions, panel meetings, focus group meetings, uploading information to the project dedicated websites, etc. were utilized. These methods helped to certain extent in information dissemination. Nevertheless, as not all parties including professional teams from project proponent and those from the community that their lives were directly and indirectly affected would have their voices expressed and heard, the outcomes of public consultation and participation were not up

to expectations. Subsequently, Leung et al. (2014) indicated that change management tools such as adaptive management (Holling, 1978; Walters, 1986), Deming cycle, tree diagram, analytic hierarchy process (Mak et al., 2014; Saaty, 1980; Saaty and Vargas, 2000), among others, can be utilized to enhance the effectiveness of EIA consultation and engagement activities. To and Chung (2014) reviewed the use and misuse of Web 2.0 technologies in Hong Kong's EIA processes. They found that although the Hong Kong Government has advocated the application of information and communications technology (ICT) for years, the deployment of ICT in social impact assessment (SIA) and EIA has been far from satisfactory. The Hong Kong Government still rely on traditional approaches heavily in EIA processes. The Web has been primarily used to broadcast information. Public consultation, participation, and engagement are basically one (official or department)-to-many (people or parties) but still the majority of stakeholders are not well informed; some are excluded. Hence, negative coverage of government projects flood the traditional media and social media (Green Power, 2011a, 2011b; Sina.com, 2013; Support Hong Kong, 2014). The remedial efforts that need to spend are huge. To and Chung (2014) suggest that the following Web 2.0 technologies shall be utilized to test which modes emerge as the best modes for public engagement in Hong Kong. The technologies include crowdsourcing, games, public participation geographic information systems (PPGIS), volunteered geographic information (VGI), and wikis.

As stated above, we have provided an overview of public engagement in Hong Kong's EIA processes. In the next section, we present a theoretical framework for the next generation Hong Kong's EIA. Then, we conclude this short paper with discussions and implications.

2. A Theoretical Framework for the Next Generation Hong Kong's EIA

The advent of ICT eliminates barriers between people and narrows the knowledge gap between the 'so-called' experts and non-experts. It was said that 'a person can be an expert of everything on the Web'. Crowdsourcing advocators suggest that two heads are better than one and the many are smarter than the few while others argue that the intelligence quotient (IQ) of a crowd equals the lowest individual IQ or the total IQ scores divided by the number of people in the crowd (Surowiecki, 2005; To and Lai, 2015; Turban et al., 2015). However, no matter we like it or not, the dominant voice of the crowd will emerge and set the trend and/or action of the 'so-called' collective opinion (consensus). During this process, deindividualuation may take place due to the influence of social identity (Reicher et al., 1995; Lea et al., 2001). Drury et al. (2012) reviewed crowd actions including riots in developed nations such as the UK. Deindividualation was identified as one of the major causes of social instability (Drury et al., 2012). In fact, the event 'Occupy Central' in Hong Kong follows more or less the same pattern in which Web 2.0 becomes the dominant channel in forming 'social identity'. Once again, the power of Web 2.0 technologies has been demonstrated. As an EIA normally involves many parties from a project proponent and many parties from the community, the deployment of ICT definitely will help to deal with this many-to-many environment. At here, we present a theoretical framework for the next generation Hong Kong's EIA.

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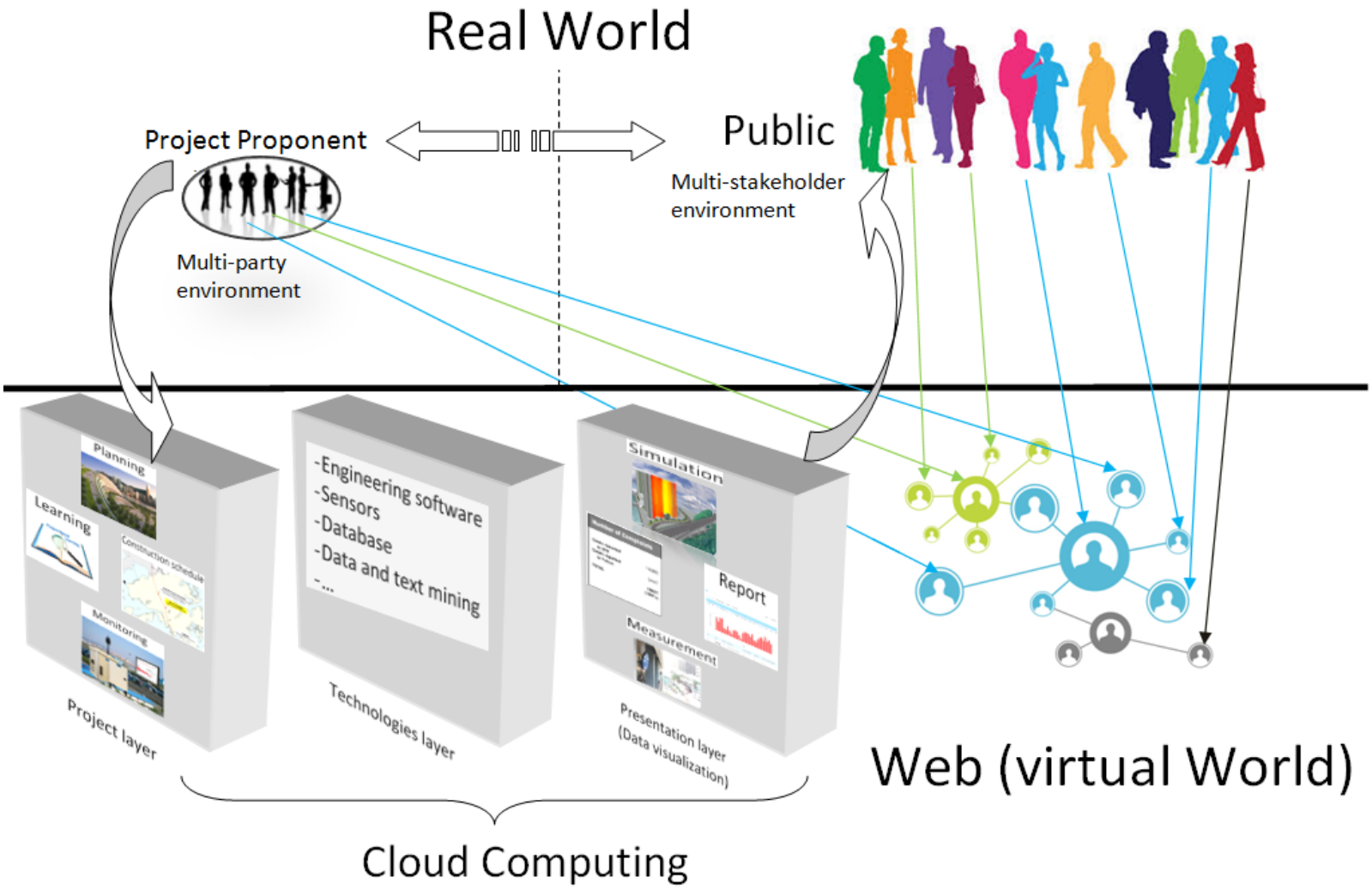

Figure 1 A theoretical framework for the next generation of Hong Kong's EIA

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Figure 1 shows the complexity of human interface in today's society. As mobile computing is everywhere, most people have dual roles in the real and virtual worlds. Hence, a project proponent needs to understand how personality and social psychology affect a person's and group's behaviors in the real and virtual worlds. Technically speaking, cloud computing (as shown in the bottom left corner of Figure 1) can facilitate the organization of EIA processes. There are three layers; namely project layer, technologies layer, and presentation layer. Project layer demands high-level management involvement and project management skills but public participation and engagement are also equally important. It is because only when the purpose of the project is developed by taking all stakeholders' needs and values as well as the project constraints into consideration, a 'shared purpose' can be created. Technologies layer covers the integration of software, sensor technologies, database, and data and text mining. Data mining can extract key parameters that may lead to non-compliances using environmental monitoring data while text mining can tap into the opinions and sentiments expressed in social media including social networking sites (SNS). Understanding public opinions and responding to public sentiments promptly are vital because they become an integral part of crisis management (Regester and Larkin, 2008). Once negative sentiments in social media are detected, prompt actions including the acknowledgement and recognition of the issues raised by stakeholders can help reducing negative word-of-mouth communication spreading in social media and may convert a public relations crisis into opportunities for improving mutual understanding and building trust. Presentation layer helps stakeholders perceive the actual cost (i.e. likely impacts) and benefit brought by the project. Data visualization facilitates the public (mostly non-experts) to visualize and auralize changes in the environment during the construction and operational phases of the project. It also enables the public to understand what have been done such as environmental monitoring, auditing, and reporting by the project proponent. Factual information must be provided to stakeholders because it is impossible, unethnical, and illegal to hide environmental incidents these days.

SNS are virtual communities in which Web users have great freedom to express their views due to visual anonymity (Christopherson, 2007; Wang et al., 2014). Messages in SNS are viral in nature because with a 'click' a message can reach tens, hundreds, or thousands of users in these virtual communities. The bottom right corner of Figure 1 shows SNS activities relating to an EIA of the project. It is highly encouraged that key members from different teams of the project proponent and government departments shall play active roles in participating and responding to the comments on the EIA in SNS. When the matter is too complex to handle individually, the representative of the project proponent/government department in SNS should at least acknowledge the matter immediately and seek helps from the other related teams/parties.

The thick solid line that separates the real and virtual worlds as shown in Figure 1 represents man-machine interfaces. With the development of mobile computing and computer everywhere, people can assess to the Web at any time and at any place. Hence, the availability of data and information from two of the three layers – project layer and presentation layer becomes a corner stone in building trust and mutual understanding. The project proponent and government departments must ensure the compatibility and transferability between different data structures, data files, and data formats. These parties also need to provide infrastructure so that data and information can be viewed from desk-top devices and mobile

devices. People now use a 'phone as a Terminal' or 'Pad as a Terminal' (paaT/PaaT; To et al., 2013).

The upper part of Figure 1 demonstrates that people interact with each other in the real world. As civil rights are basic elements in a modern society, the project proponent and government departments must understand the key attributes of public participation (or engagement) as defined by the United Nations (UNECE, 2013). Public participation is defined as the practice of involving members of the public in the agenda setting, policy development, and decision-making on projects and developments that interact with the environment and communities (Rowe and Frewer, 2005; UNECE, 2013). Public participation is different from public communication in which data and information are broadcasted from the project proponent to the public. It is also different from public consultation in which data and information are obtained from some selected representatives of the public in an ad hoc manner. Public consultation has been criticized due to its lack of open, transparent, and on-going dialogue (Leung et al., 2014).

3. Discussions and concluding remarks

The Digital 21 Strategy provides a blueprint to the development of ICT in Hong Kong. Nevertheless, the advent of Web 2.0 technologies makes most of the planned strategies to be unrealistic and outdated quickly. Hence, adaptive management, particularly treating all unforeseen changes as learning opportunities, is probably one of the best approaches in ensuring Hong Kong's EIA to be accepted by the people at large.

On one hand, cloud computing enables different parties from the project proponent and government departments to share and exchange information, knowledge, and ideas simultaneously. This can facilitate project management and misunderstanding between these parties can be minimized. On the other hand, mobile computing and computer everywhere enable stakeholders in the community to have great capability to assess to vast amount of technical and non-technical information. People of these stakeholder groups have used social media as a key channel to exchange their opinions and feelings towards the governance of EIA (and SIA). Without acknowledging the positive and negative comments about an EIA promptly in social media degrades the responsiveness of the project proponent and government departments from the community's perspective. Hence, utilizing social media, particularly SNS as a communication channel, can make an EIA process agile. Hence, we present a theoretical framework for the next generation Hong Kong's EIA that incorporates all EIA elements offline and online.

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