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The Application of Crowd Sourcing in Educational Activities

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Abstract : This paper analyses the role of crowd sourcing use in educational activities. In recent decades, the rapid growth of innovative Internet-based information and communication technologies created a new field of opportunities for educational organizations to reach their goals. Crowd sourcing, as defined by Jeff Howe (2006), is the act of taking a job traditionally performed by a designated employee and outsourcing it to an undefined, generally large group of people in the form of an open call. The newness of the term indicates that there is not significant literature on the subject of how this operating method is utilized in educational activities. The objective of this paper therefore is to take an exploratory look at how educational organizations are using crowd sourcing as part of their activities at the present time, and to suggest how the practice of crowd sourcing may spread to other educational activities as time goes on.From the textual analysis of these definitions and the revision of the literature eight main characteristics were identified: the crowd, the task at hand, the recompense obtained, the crowd sourcer or initiator of the crowd sourcing activity, what is obtained by them following the crowd sourcing process, the type of process, the call to participate, and the medium.

1. INTRODUCTION

In recent decades, the rapid growth of innovative Internet based information and communication technologies created a new field of opportunities for organizations to reach their goals. One of the alternatives is—crowd sourcing. Crowd sourcing, as defined by Jeff Howe (2006), is the act of taking a job traditionally performed by a designated employee and outsourcing it to an undefined, generally large group of people in the form of an open call. Educational organizations have many tasks that are essential, but that require time and energy that could be used to focus on instruction, crowd sourcing can be the answer.

Educational Activities
The article analyses possible role of crowd sourcing use in educational activities. The newness of the term "crowd sourcing" indicates that there isn't any significant literature on the subject of how this operating method is utilized not only in educational activities, but also in other types of enterprises. The objective of this paper therefore is to take an exploratory look at how educational organizations are using crowd sourcing as part of their activities at the present time, and to suggest how the practice of crowd sourcing may spread to other educational activities as time goes on.

Theoretical Background: Roots and Principles of Crowd sourcing

Crowd sourcing is a relatively recent concept that involves many different practices and approaches. This diversity leads to the blurring of the limits of what is crowd sourcing and what this word means. Also, there is a close relation between co-creation, user innovation and user generated activities. Estelles-Arolas and Gonzalez-Ladron-de-Guevara (2012) tackled this problem in their article "Towards Integrated Crowd sourcing definition". By analyzing existing definitions of crowd sourcing they have extracted common elements and characteristics of any crowd sourcing initiative and based on this presented consistent definition of crowd sourcing. After reviewing 209 documents (journal papers, books, working papers, etc.) the authors found 40 original definitions.

From the textual analysis of these definitions and the revision of the literature eight main characteristics were identified: the crowd, the task at hand, the recompense obtained, the crowd sourcer or initiator of the crowd sourcing activity, what is obtained by them following the crowd sourcing process, the type of process, the call to participate, and the medium. Proposed definition was tested on 11 case studies and was adjusted to fit them all. Unfortunately, its length and complexity makes it unusable. Because of that I will use in this paper the definition proposed by the creator of crowd sourcing Howe (2006)

Volunteered Geographic Information (VGI)

Until recently virtually all geographic information was produced in the form of maps and atlases, by mapping agencies and corporations, and dispersed as paper copies to users researchers, consultants, and members of the general public through a system of retail distribution. The geospatial technologies that began to appear in the 1960s did little to change this set of arrangements, since their major impacts were on the acquisition of raw data through new and more efficient instruments, its semi-automated compilation, and its use in such systems as GIS. The transition from paper-based to digital dissemination, from paper map sheets to tapes and eventually internet distribution, left most of the arrangements intact.

The Quality of Volunteered Geographic Information (VGI)

As noted above, geographic information can be defined as information linking a property to a location on or near the Earth's surface and perhaps a time. Because many of these components must be measured, and because the potential amount of such information is infinite, it is inevitable that all geographic information be subject to uncertainty. While early literature on the topic (Goodchild and Gopal 1989) emphasized accuracy, implying the existence of a truth to which a given item of information could be compared, more recently the emphasis has been on uncertainty, reflecting the impossibility of knowing the truth about many aspects of the geographic world.

Crowd sourcing in Educational Activities: Proposed Conceptual Model

The paper presents a conceptual model of crowd sourcing application in educational activities and needs to be validated empirically. The model is supported by the analysis and synthesis of the scientific literature and case studies. A traditional educational organization, for example Universities, is populated by students, teachers, researchers, administrators and staff, and possesses a certain legal status by maintaining a relationship with accreditation bodies and government. Just like any other organizations, educational organizations have their fair share of problems. These problems come in all shapes and sizes and can sometimes seem unrelenting. The usual method of attack for solving these problems involves sending out surveys, forming committees, setting up forums, and hiring consultants. A new way for solving issues could becrowd sourcing. Since virtual relationships are now possible and have

become commonplace outside of educational settings, management of the educational organizations should take into consideration workforce found in the crowd. First of all, networks of all sorts (Facebook, Ning, Twitter), webcams, Skype, etc. have changed the very definition of presence. Second, technology has changed who is part of the team. Many of the functions related to infrastructure can be subcontracted or otherwise outsourced. For example, instead of giving lectures in person, an instructor may deliver lectures via podcast .

Educational Tasks and Supporting Tasks

There are so many ways to use crowd sourcing within organization, so the author of the research divided ways to apply it into to two groups: educational tasks and supporting tasks. The medium of the Web enables to harness collective intellect among a population in ways face-to-face communication cannot, due to limitations of time, place, etc. This chapter argues that the crowd sourcing model, a successful, Web-based, distributed problem solving and production model for business, is an appropriate model for enabling educational organizations in their processes. Crowd sourcing has emerged as a vital aspect of education on the web, because it promotes the openness and sharing of resources and knowledge contributed by communities.

Crowd sourcing Educational Tasks

Educational activities have significantly evolved over the past decade due to the emergence of Web 2.0 and 3.0 internet technologies that facilitate new learning forms in adaptive online environments. New communication tools have begun to change how society understands and approach teaching and learning, giving us new opportunities to connect with, manipulate, and share learning content and providing a means for a more social learning experience. Evolved internet technologies enable learners and educators to co-create learning. Crowd sourcing in the development and use of educational materials allows web-tools to leverage collaboration and produce materials using help of user groups and other stakeholders. Such community-based design can help capture, refine, carry out, systematize or evaluate aspects of online learning materials. This chapter is designed to explore existing practices that educational organizations use while employing crowd sourcing. First use of crowd sourcing can be noticed in data collection and analytics. Most notable works are collaboration between scientific organizations and students of Universities or just general public.

Most important aspect of Crowd sourcing

NASA's Clickworkers is a project which involves space enthusiasts to categorize crater patterns on Mars. One can mention a number of Universities that crowd source part of their research, for example: Screensaver Project (Oxford University with the National Foundation for Cancer Research), SETI (Search for Extraterrestrial Intelligence), Quake-Catcher Network Turn your laptop into a seismic sensor (QCNLive). Most important aspect of crowd sourcing is that which involves students and young researchers in solving big and important problems. San Francisco State University associate professor of biology Gretchen LeBuh created the Great Sunflower Project with leftover grant money in 2008. The University of Alabama is allowing the public to participate in two projects for their library. They allow users to "tag" or "transcribe" materials from existing collections,   meaning that from the comfort of their own computer users can tag people, places and accidents in the material. This helps to create crowd sourced content. Crowd sourced content is also used in creating programmes for classes and textbook design.

Writing and publishing

Writing and publishing a complete book is and has been a difficult process for one or few persons to cope with. With the help of crowd sourcing, non-professional enthusiasts have the opportunity to participate with others in the creation of new types of books. Hundreds of people with an interest in literacy and lesson design could choose areas of interest and create amazingly interesting, deep, connected, and focused lessons.

A good example of a crowd sourced textbook is the project led by Professor E. Gehringer from North Carolina State University (US). The project involved 120 students who worked together to create a textbook for computer science and computer engineering class. Participants experienced peer reviewed writing and the use of wikis in the process. As is pointed out by Gehringer (2011), in the project the group used open software Expertise and were guided by deadlines and expectations for review and revision, wiki workspace and coordinated writing of sequential chapters, different types and stages of feedback including anonymous peer reviews, and instructor and teaching assistant editing.

Instructional Designers

As it was pointed out by the creator of this project, the most important factor why educational organizations need wiki textbooks is feel of ownership students get after participating in such projects. They get more involved and learn more because of that. A global project was led by Professor Charles Wankel from St. John's University. This project of creating a textbook Project Management for Instructional Designers involved hundreds of co-creators from 90 countries. Similar projects keep popping up around the globe. There are a lot of advantages to crowd sourcing a book—up-to-date texts, case studies and results, minimized cost, interactive learning and involvement of the students—but one must keep in mind that crowd sourced projects require time and effort in coordinating the collaborative writing and review process to ensure that the end product is beneficial to learners and maintained moving forward. Nevertheless, crowd sourcing is emerging as a way in which professors, teachers and other content experts are not only creating textbook content, but also managing the collaborative writing process of multiple contributors and customizing products for use in their courses. New tools and knowledge available online will allow to apply crowd sourcing in even more educational activities.

Supporting Tasks

As was pointed out in the previous section, crowd sourcing can play a powerful role within educational organization. Use of crowd sourcing can keep organizations forefront of education innovation, prepare students for the online world challenges, and most importantly to stimulate closer communication between students, faculty and administration and beyond the campus with other institutions and groups. But crowd sourcing can only be helpful in solving on-campus problems that educational organizations face. Crowd sourcing can help find solutions for on-campus issues and provide fresh feedback or even ideas on how to solve problems differently. Firstly, it is important to mention that crowd sourcing strategies in non-educational organizations are used to reach their goals. Because of the newness of the concept there is no taxonomy created for uses of crowd sourcing, but most commonly mentioned strategies in scientific literature are: crowd wisdom, crowd creation, crowd funding, crowd democracy and crowd reviews . Crowd sourcing can be used for problem solving as well innovation because of that it can play a key role in getting the whole organizational body co-working together on the issues central to the institute. This section will provide examples of how these strategies can be used for supporting tasks of educational organizations.

California State University Fullerton (US)
It looked to its community to suggest strategic initiatives for the institution's future simply through the medium of email. Community was asked to suggest possible strategic initiatives for the development of University and propose initiatives that will result in specific projects that match our strengths with our opportunities. This is a perfect example for use of crowd wisdom and crowd democracy for issues resolution. Head of educational organizations not always have the relevant insight that students often have into their campus and educational needs. Another example of crowd wisdom use could be Indiana University initiative to change costly tech-support help desk by allowing computer users to answer each other's questions instead. Carleton University (US) is using crowd sourcing tools, including text messages, voicemail, and the Internet to capture the local history of the Pontiac region through its community. Project called HeritageCrowd is creating database for online historical exhibits, using information from the inhabitants who actually reside in the region. Positive outcome and mass participation proved that people find it amusing contributing to academic work as a community. Such projects are clear example of crowd creation used in educational organization when without help of the community the University would have to hire people to conduct surveys on topic to get information for historical exhibitions.

Crowd funding
Crowd funding is an especially topical subject for educational organization since they often have limited funds for their projects or even students. Globally, underprivileged, but well-performing students often do not have a chance to go to college since it costs a lot. For this reason, a platform named Takeashine helps students get donations through crowd funding. Crowd funding allows more potential graduates to get higher education diploma, since the public is comfortable with donating small amounts of money for a good cause. Crowd sourcing became a famous concept mainly because huge corporations started to outsource their marketing campaigns while asking the crowd to create commercials, logos or even names of the products or services. The Unigo platform was created to fulfil the marketing need of educational organizations. With the help of this tool graduate students can create reviews and profiles on their schools or universities. These profiles are much more useful and exciting for future students or their parents when they are making a decision where to study.

Ability to reach
This section showed variety of ways universities are using crowd sourcing as a tool. One of the primary advantages of crowd sourcing is the ability to reach and engage a broader intelligence pool with broader set of mind organizations can develop something new and very exciting for the whole community. One must keep in mind, that crowd sourcing should become part of organization's culture and not some last minute "life west" when other tools do not work. Community and especially students want to feel their input is valuable, respected and changes are made according to the input of the crowd.

2. DISCUSSION

People want to participate and to collaborate on important projects. The positive outcomes of universities, colleges and high schools using crowd sourcing show that the best person to do a job is the one who most wants to do that job. How many retired professors, teachers, educators, and other professionals would still like to contribute? How many people love

education, have valuable skills and expertise, but work in fields outside of education? These and many similar questions are what drive crowd sourcing for education. After a study of possible ways to use it in educational activities one must follow up with a discussion of why organizations should crowd source their activities. Most important of all the benefits is that crowd sourcing offers a bunch of benefits to the students that participate. For example, crowd sourcing give students real world experience in coming up with creative solutions to important problems. Students can apply classroom knowledge to real world problems and learn the ins and outs of their chosen fields from a practical perspective. Also this alludes to the quality of the solutions needed. The students know the community and therefore have a better shot at creating solutions that truly fit the community's needs. Students involvement also leads to positive PR. Educational organizations can gain positive reputation while involving not only the students but community in decision making process. It is important to note that more and more of society at large, and consequently many students, are demanding an educational system that works for and with them. So, a student-centred learning environment should be the priority of educational organization.

3. CONCLUSION

Agencies are inevitably stretched thin during an emergency, especially one that threatens a large community with loss of life and property. Agencies have limited staff, and limited ability to acquire and synthesize the geographic information that is vital to effective response. On the other hand, the average citizen is equipped with powers of observation, and is now empowered with the ability to geo register those observations, to transmit them through the Internet, and to synthesize them into readily understood maps and status reports. Thus the fundamental question raised by this paper is: How can society employ the eyes and ears of the general public, their eagerness to help, and their recent digital empowerment, to provide effective assistance to responders and emergency managers? Many aspects of the data quality problem need further research. As noted earlier, an important item for further research is the formalization of rules that permit contributed geographic information to be assessed against its geographic context, and the prototyping of software tools that would implement these rules. Research is also needed to interpret what is known about trust and volunteerism in the specific context of crowd sourced geographic information, to devise appropriate mechanisms and institutions for building trust in volunteer sources. The recent experience of the Santa Barbara fires suggests that a community can indeed contribute effectively. There are risks, of course, and more research is urgently needed to understand and minimize them. Not discussed in this paper, but also of critical importance, is the role of the citizen in those parts of the world that lie beyond the ' digital divide, ' where the Internet and its services are largely unavailable.

It is clear, however, that society has now entered a new era where geographic information will not only be used by all, but created by all, or at least by a dense and distributed network of observers. This leads to an entirely new vision for Digital Earth, one of a dense network of distributed, intelligent observers who are empowered to create geographic information, and particularly the types of geographic information that remote sensing and other large-scale acquisition systems are unable to produce. Protocols and institutions will be needed to ensure that the result is as reliable and useful as possible.

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