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## Introduction to the Special Issue on Human-Computer Interaction in the Web 2.0 Era

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# Transactions on Human-Computer Interaction

THCI

Editorial

## Introduction to the Special Issue on Human-Computer Interaction in the Web 2.0 Era

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### THE WEB 2.0 PHENOMENON AND HCI RESEARCH

Web 2.0, the “dynamic web,” is one of the most effective applications to date of information and communication technologies in the way it revolutionized how individuals interact with information. The term Web 2.0 is largely associated with Tim O’Reilly (Graham, 2005; O’Reilly, 2005), and is a loosely defined concept that represents a variety of technologies. Some of these are development platforms while others are applications used mostly for social computing and interaction. The latter group of technologies, also known as the Social Web (Rheingold, 2000) has arguably been in the core of the World Wide Web from its conception (Porter, 2008). Moreover, the developmental components of Web 2.0 that moved computing beyond desktops via the use of web-based “building blocks” such as web services not only made it possible to realize the true potential of the social web, but to a large extent made it synonymous with Web 2.0. Our use of the term Web 2.0 also treats it as identical to the social web.

As such, Web 2.0 is omnipresent in virtually every aspect of our lives from social networking to viral marketing to political campaigning. Masses, who to a large extent used to be mere consumers of content generated by relatively few “authorities,” are now in a position to be “content providers.” This means a sizeable portion of content in circulation today is generated by “novices” either in the domain of that content or the technology used in its generation and dissemination. This, by itself, made inevitable a paradigm shift in the interaction of users with information technology. Another radical change has been in the way people consume user-generated content and communicate with the “creators” or other users of that content.

We issued the call for papers for this special issue in 2010 based on our observation of this strong trend in the development, adoption, and use of Web 2.0 applications, and the relative scarcity of research on Web 2.0 from a Human Computer Interaction (HCI) viewpoint. There are many elements that influence the interaction of people with Web 2.0 applications. In our call for papers, we noted: “It is presumable that with better identification of users, their motivations, and interaction needs, user experience with Web 2.0 will be substantially improved.” We also highlighted the “any time any place” nature of HCI in the era of Web 2.0 as many users interact with Web 2.0 applications using mobile devices, thus enabling near real-time information sharing.

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When we reflect upon these observations today, we see that the trend in the adoption of Web 2.0 applications has continued at a tremendous pace. As an example, as of early 2011 when the submissions to this special issue were due, there were over 600 million Facebook and about 175 million Twitter accounts. In 2010 alone, there was a growth of 200 million and 50 million accounts, respectively.<sup>1</sup> Within the same time frame, the number of blog posts published on one of the most popular blogging platforms, WordPress.com, increased from approximately 1.8 million to 5.5 million a week, while the number of blogs read increased from 550 million to 660 million a week.<sup>2</sup>

While the growth in adoption is clear, assessing the extent and quality of user experience with Web 2.0 and of the consequences of Web activity is a challenge. Scanning the issues of leading information systems and human computer interaction journals published since the issue of our call for papers, we found only a few articles (e.g., Marett et al., 2011; Aggarwal et al., 2012; Dewan and Ramaprasad, 2012) that address this challenge.

As a consequence, current HCI research is not in a strong position to guide practice in the design and development of IT artifacts in the form of stand-alone Web 2.0 tools or add-ons to interface with existing Web 2.0 systems. A few exceptions can be found in the archives of this journal where Schuff et al. (2010) proposed design guidelines to improve user interactions with weblogs, and Kobler et al. (2011) introduced a system that allows online social network users to complement their offline social interactions with their social networking site (Facebook) profile information. Given this context of a broad domain with relatively little published research, we were fortunate to receive interesting and novel contributions that address some aspects of the above-mentioned challenges. Below is a summary of the 4 papers that make up the special issue.

## SUMMARY OF THE PAPERS

“Developing an Online Community for Women in Computer and Information Sciences: A Design Rationale Analysis” by Mary Beth Rosson and John M. Carroll provides a variety of useful lessons for Web 2.0 researchers. It tells the story of how faculty and students iteratively developed an online community, cycling through a variety of Web 2.0 applications before settling on the current version which is built on a Drupal platform. The research utilizes two methodologies: action design and design rationale analysis. The bigger frame is action design research (Sein et al., 2011) which “conceptualizes the research process as containing the inseparable and inherently interwoven activities of building the IT artifact, intervening in the organization, and evaluating it concurrently” (p. 37). In this case, the IT artifact is a Web 2.0-based online community; the organization is a group dedicated to sustaining a community of women who want to consider being, are studying to be, or are practicing computer and information scientists; and the evaluation is accomplished through design rationale analysis. According to Moran and Carroll (1996) there are at least six kinds of design rationale, but all of them in some way refer to the documentation of the reasons behind the design of a tangible artifact. That is the spirit in which Rosson and Carroll conducted their evaluation of the Web 2.0 application iterations that they created. Over a period of more than two years the authors along with a number of students created the various versions of the online community, which grew slowly but surely in terms of the number of members and the amount and types of content. A key design criterion was enabling community members without high level technical skills to take the lead in maintaining and further enhancing the community application. This was one of the reasons why the last iteration was built using Drupal.

“Web Weather 2.0: Improving Weather Information with User-Generated Observations” by Katarina Elevant and Stefan Hratinski is also about the design of an application. Similar to but different from the Rosson et al. paper, the authors also used an action design research approach. The problem space was to find a way to make weather forecasting for specific local areas more accurate than forecasts that are typically based on one observation location in a relatively large area (100 square kilometers). Using the principles of weather forecasting along with the knowledge that a social media application could enable capture of current localized data, the authors developed a prototype system. Then they refined the system by assessing the kinds of current weather conditions three user groups (children, noncommuters and commuters) were able to report. The result is an application called Shareweather.

“Emotions in the Twitterverse and Implications for User Interface Design” by Anatoly Gruzd is one of two papers about what motivates users of one of the newest and most popular social media applications. This paper focuses on the difference between positive and negative messages, and uses multiple methods to tease out ideas for updating one facet of the Twitter interface. While the author takes a standard (rather than an action research-based) approach to design science, he focuses on tweaking an interface rather than building an application. Moreover, he does not empirically evaluate the design. But, he uses empirical methods to demonstrate that the proposed interface change is warranted. The kernel theory for this research is that positive emotions (e.g., “happiness”) are more likely to produce contributions to social media than negative emotions. In this paper, automated sentiment analysis (Liu, 2012) is applied to a large dataset of “tweets” about the 2010 Winter Olympics to determine the influence of positive versus negative messages. A user survey was then conducted to help validate the findings of the sentiment analysis. The results lead to a proposal to revise the user interface of Twitter to increase the likelihood that tweeters would post/disseminate negative messages.

“Disentangling Twitter’s Adoption and Use (Dis)Continuance: A Theoretical and Empirical Amalgamation of Uses and Gratifications and Diffusion of Innovations” by Constantinos K. Coursaris, Wietske Van Osch, Jieun Sung, and Younghwa Yun, tests a simple model that examines what factors contribute to usage of Twitter. This paper differs from the others in the special issue in that it applies a traditional research approach (rather than design science techniques) by statistically analyzing the results of a survey of active and inactive Twitter users. One or the other of two theories, stated in the paper’s title, has traditionally been used to explain usage of social media. This paper creates a model that incorporates both theories, and the data show that the relationships between constructs and usage vary with respect to active and inactive users.

## GOING FORWARD

If Web 2.0 is practically synonymous with the social web, then the study of Web 2.0 is inherently HCI research. Further, due to the dynamic and ubiquitous nature of Web 2.0, “HCI in the Web 2.0 era” is rather multi-faceted and complex requiring a variety of perspectives from social to technical. The papers in this special issue address some important and yet necessarily limited parts of this large space.

HCI research on Web 2.0 would be advanced by conceptual and theory building papers, design science studies, and empirical research that investigates the success of the interaction of people with Web 2.0. Below we list specific topics that, in our opinion, should take precedence in the study of HCI in Web 2.0:

- Identification and classification of Web 2.0 user profiles and motivations
- Analysis of Web 2.0 use patterns (e.g., Marett et al., 2011)
- Impact of Web 2.0 on user activities
  - Personal-life and business impacts (e.g., Dewan and Ramaprasad, 2012)
  - Social and political impacts (e.g., Wattal, et al., 2010)
- Web 2.0 in the organizational context (e.g., Aggarwal et al., 2012)
- Design, implementation, and evaluation of innovative Web 2.0 user interfaces (e.g., Elevant and Hratinski, Gruzd, and Rosson et al. in this special issue)
- Methods for indexing, searching, and mining Web 2.0 data (e.g., Chau and Xu, 2012)
- Impacts of mobility and distributed computing
- Adoption and use of Web 2.0 applications (e.g., Coursaris et al. in this special issue)

As can be seen, recent research (including the articles in this special issue) has started to cover some of these topics. Given the relevance and impacts of the phenomenon, we expect to see an exponential growth in in-depth research into these topics.

## CONCLUSIONS

Web 2.0 is used in every facet of modern life, making it essential for researchers, practitioners, and all modern information users to understand it and contribute to its development. We believe the HCI community is in a unique position to contribute to this understanding as it can unify technical, cognitive, and social aspects of research on Web 2.0 activities. We are encouraged by the recent publication of rigorous and focused research on the topic, and are hoping that this special issue contributes to an increase of interest and activity in HCI research in the era of Web 2.0.

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<sup>1</sup> <http://royal.pingdom.com/2012/01/17/internet-2011-in-numbers/>, last accessed Oct. 25, 2012

<sup>2</sup> <http://en.wordpress.com/stats/>, last accessed Oct. 25, 2012

## ABOUT THE AUTHORS



**Ozgur Turetken** is a Professor at the Ted Rogers School of Information Technology Management at Ryerson University. His current research interests are in applied text analytics and human computer interaction in the Web 2.0 environment. His previous work has appeared in several high level information systems, decision science, human computer interaction, computer science and communication journals as well as the proceedings of international conferences. He is the current program chair for the AIS Special Interest Group on DSS (SIGDSS), and serves on the editorial board of the *AIS Transactions on Human Computer Interaction*. Dr. Turetken holds a BS in EE, an MBA (both from Middle East Technical University – Ankara, Turkey), and a PhD in Management Science and Information Systems (Oklahoma State University).



**Lorne Olfman** is a Professor in the Center for Information Systems and Technology at Claremont Graduate University (CGU). Lorne's research interests include: how software can be learned and used in organizations, the impact of computer-based systems on knowledge management, and the design and adoption of systems used for group work. Along with Terry Ryan, Lorne co-directs the Social Learning Software Lab ([SL]<sup>2</sup>). A key component of Lorne's teaching is his involvement with doctoral students; he has supervised 51 students to completion and has served on more than 60 other dissertation committees. As an active member of the Information Systems community, Lorne has co-authored more than 130 refereed articles including 46 in journals, 28 as book chapters, and 60 as conference papers. He is a Senior Editor of the *AIS Transactions on Human Computer Interaction*.

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