On the Role of Engagement in Human Information Interaction: From Research to Implementation

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Abstract
This workshop will provide a forum for researchers, practitioners and developers interested in user engagement and emotion in the context of human information interaction. Specifically, the workshop aims to address the following questions: "How do we ensure that the measurement of subjective information experience is robust and scalable?", "How do we design interfaces for engaging and emotionally compelling experiences?", and "How do we prevent disengagement?" The ability to answer these questions relies upon: a solid conceptual understanding of subjective experiences; robust, scalable approaches to measuring engagement; and the ability to utilize this knowledge in information systems and interface design. This three-part half-day workshop will include: talks by the organizers to ground the workshop's themes; position paper presentations and design exemplars from attendees, and an interactive session focused on design scenarios and prototyping. The intersection of emotion and engagement with measurement and design in information interaction contexts is a timely issue for the iSchool community.

1   Introduction

Everyday we spend a significant amount of time online, connecting with other people, accessing information and sharing knowledge. In parallel, we use a broad array of information resources (e.g., Q&A forums, databases) and modes (e.g., smart phones, social networking applications) to interact with information. This abundance of digital content is problematic for many users, but also information purveyors, such as libraries and other cultural heritage organizations, as well as online search companies, e-commerce firms, educational institutions, governments, etc.: How can information environments be designed to satisfy functional user and organizational needs, yet still be compelling?

For the user, access to relevant content has become a non-trivial task. Despite the abundance of work in information retrieval, human-computer interaction, and design, many information systems may be considered inadequate due, in part, to the failure to understand the inter-relation between the physiological, cognitive and affective needs of users. The time is right to develop a coherent framework that accounts for the unique personalities, emotions, motivations and information needs that inform, constrain, and influence people's interactions with information in manifold ways. Development of scalable and accurate methods for quantifying user engagement in information interaction contexts, including but not limited to online search and digital libraries, could mitigate the factors that lead to abandoning and disengaging from information systems.

In recent years, there has been much emphasis on emotion and engagement in digital information interactions [9]. Self-report measures [12] and physiological methods, such as facial recognition [1,10], have been used in small-scale user studies, while large-scale web analytics have sought to identify behavioral patterns of engagement [2,3]. Yet, we are still challenged by the measurement of highly subjective information experiences. Traditional metrics of engagement are typically optimized to capture

the whole spectrum of the user experience in a single way, resulting in inaccurate assessments. Numerous studies have emphasized the need to move towards a broader understanding of engagement for a number of diverse domains [6,11]. What is more, we do not yet know what makes one website or digital library interface more or less engaging than another.

2   Workshop Themes

This workshop aims to provide a forum for researchers, developers, and students interested in user engagement and emotion. The workshop will focus on subjective experiences with information systems broadly defined, including digital libraries and repositories, mobile apps, or museum, web search, social media, or online learning interfaces. Specific questions for exploration include:

- What is the value of developing engaging information systems? What do they contribute to the user experience and/or user outcomes?

- What methods and measures are appropriate for evaluating subjective user experiences? How do we know if they are robust?

- How do we design for user engagement with information-rich systems and applications? What ethical, cultural, usability, and aesthetic concerns must be considered?

- How do we prevent disengagement?

- How do we "scale up" small-scale techniques for measuring engagement and emotion and connect them with large-scale techniques, such as web analytics?

3   Format

This half-day workshop will be structured as follows (with breaks between sessions):

- Welcome and introductions (10 minutes).

Session One: Foundational talks by the organizers related to the workshop's purpose and themes (60 minutes):

- Current state of user engagement research in various online information settings (O'Brien);
- Emotion research in information retrieval and museum communities (Lopatovska);
- Scalability issues, web analytics, and engagement in web search (Arapakis).

Session Two: Lightning talks based on position papers by attendees. Examples of applications that illustrate engaging/emotional design, as well as innovative research studies, are encouraged (50 minutes).

Session Three: An interactive session, centered on design scenarios, where we will explore innovate ways to create engaging and affectively compelling information systems (80 minutes).

- Participants will develop engaging and emotional interface prototypes for specific information environments based on provided scenarios, and present these to the larger group.

Workshop wrap up:

- Plans for future engagement and community building (10-15 minutes)*.*

The organizers invite potential attendees to submit brief position papers to the organizers addressing one or more workshop themes or illustrating systems that exemplify engaging design. Workshop proceedings will be published in the University of British Columbia's Institutional Repository.

4   Conclusion

A central question being posed by researchers, practitioners and designers in a variety of information settings is, "Are we engaging users?" The ability to answer this question relies upon: a solid conceptual understanding of subjective experiences; robust, scalable approaches to measurement; and the ability to utilize this knowledge in information system design. Thus the intersection of emotion and engagement with measurement and design in information interaction contexts is a timely issue for the iSchool community. The format of the workshop offers opportunities for attendees to engage with the theoretical (session 1) and applied (session 3) nature of emotion and engagement, and to bring their own examples, experiences, and challenges into the session (session 2).

5   References

[1] Arapakis, I., Athanasakos, K., & Jose, J. M. (2010). A comparison of general vs personalised affective models for the prediction of topical relevance. In *Proceeding of the 33rd International ACM SIGIR Conference on Research and Development in Information Retrieval*. pp. 371-378.

[2] Arapakis, I., Bai, X., & Cambazoglu, B. B. (2014). Impact of Response Latency on User Behavior in Web Search. In *Proceedings of the 37th International ACM SIGIR Conference on Research and Development in Information Retrieval*. pp. 103-112.

[3] Arapakis, I., Lalmas, M., & Valkanas, G. (2014). Understanding Within-Content Engagement through Pattern Anal- ysis of Mouse Gestures. In *Proceedings of the 23rd International Conference on Information and Knowledge Management*.

[4] Bartindale, T., Clarke, R., Shearer, J., Balaam, M., Wright, P., & Olivier, P. (2011). Bridging the gap: implementing interaction through multi-user design. In *Extended Abstracts on Human Factors in Computing Systems (CHI EA '11)*. New York, NY: ACM. 2071-2076.

[5] van Dijk, E., Lingnau, A., & Kockelkorn, H. (2012). Measuring enjoyment of an interactive museum experience. *ICM '12 Proceedings of the 14th ACM international conference on Multimodal interaction*, 249-256.

[6] Fantoni, S. F., Stein, R., & Bowman, G. (2012, April). Exploring the relationship between visitor motivation and engagement in online museum audiences. *Proceedings from Museums and the Web Conference*. San Diego, CA.

[7] Hassenzahl, M. (2003). The Thing and I: Understanding the Relationship Between User and Product. In M. A. Blythe, A. F. Monk, K. Overbeeke, & P. C. Wright (Eds.) *Funology: From Usability to Enjoyment* (pp. 31-42). Norwell, MA: Kluwer Academic Publishers.

[8] Hassenzahl, M., & Tractinsky, N. (2006). User experience – a research agenda. *Behaviour & Information Technology, 25*(2), 91-97.

[9] Lalmas, M., O'Brien, H.L. & Yom-Tov, E. *Measuring User Engagement*. Morgan & Claypool Publishers, forthcoming.

[10]   Lopatovska, I. (2014). Toward a model of emotions and mood in the online information search process. *Journal of the American Society for Information Science and Technology, 65*(9), 1775-1793. doi: 10.1002/asi.23078.

[11]   O'Brien, H.L. & Lalmas, M. (Eds.). *Why Engagement Matters: Cross-Disciplinary Perspectives and Innovations on User Engagement with Digital Media*. Springer (in preparation).

[12]   O'Brien, H.L. & Toms, E.G. (2010). The development and evaluation of a survey to measure user engagement. *Journal of the American Society of Information Science and Technology, 61*(1), 50-69.