CAIS Poster: An Exploration of Approaches to the Support of Serendipity in Digital Environments

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Abstract: We explore how the common elements of serendipity identified in previous models may be used to identify different approaches to the design of digital environments to support serendipity. Three approaches are examined: social search, recommender systems, and visualization.

Résumé:

1. Introduction

We often associate serendipity – an unexpected experience prompted by valuable interactions with ideas, information, objects, or phenomena – with physical or face-to-face interactions. Two often cited examples are browsing the library stacks (Martin and Quan-Haase 2013) and conversations with colleagues (McCay-Peet and Toms in press). However, our interactions with information and other people are often mediated by technology, which has led to an interest in the development of tools that support serendipity. We argue that while providing support for targeted search in digital environments, such as websites, databases, and search engines, is vital, so too is providing opportunities for users to encounter interesting and useful information they may not be currently looking for. Furthermore, we argue that support for serendipity should take into consideration the entire process that extends from the encountering of information through to its use. In this poster, we outline the main elements of serendipity identified in prior research and show how current digital tools may be leveraged to support each of these elements, thus helping to facilitate the phenomenon as a whole.

2. Main Elements of Serendipity

Several models of serendipity and related constructs have emerged in recent years to explain the phenomenon of serendipity as experienced in work, research, and everyday life both in digital and physical environments (Erdelez 2004; Makri and Blandford 2012; Rubin et el. 2011; Sun et al. 2011). The following main elements of serendipity have been identified in two or more of these models (McCay-Peet and Toms in press; Quan-Haase and McCay-Peet in press):

Trigger: A verbal, textual, or visual cue that initiates or sparks an individual's experience of serendipity.

Connection: The recognition of a relationship between the *trigger* and the individual's knowledge and experience.

Follow-Up: Actions taken to make the most of a *trigger* or *connection* and obtain a valuable outcome.

Valuable Outcome: The positive effect of the serendipitous experience both realized and projected.

Unexpected Thread: The unexpected, chance, accidental, or surprising element that is evident in one or more of the *trigger*, *connection*, *follow-up*, or *valuable outcome* elements of the serendipitous experience.

3. Mapping Digital Tools to Elements of Serendipity

What approaches may support the process of serendipity? What tools have the potential to support the *trigger*, *connection*, *follow-up*, *valuable outcome*, and *unexpected thread* that in combination may lead to serendipity? We focus here on three types of digital tools that may support serendipity.

Social search: A type of information retrieval based on the digital objects that people from a user's social network have interacted with (Karweg et al. 2011). Social search tools may help users take notice of a *trigger* they may not have otherwise encountered or perhaps may be more likely to pay attention to it because of its relevance to people in their network. Those social search tools designed for exploration may help users make a *connection* between what they encounter and a background problem. The more goal-oriented social search tools may help them to *follow-up* and make sense of the information encountered. Finally, the dynamic social component of these tools may lead users to perceive their experiences as *unexpected*.

Recommender systems: Defined as "software tools and techniques providing suggestions for items to be of use to a user" (Ricci et al. 2001, 1). Items may range from consumer products to academic papers. Recommender systems may *trigger* serendipity by bringing interesting and useful information to the attention of users that they may not have found through traditional search box queries. By providing diverse recommendations these tools may facilitate *connections* by drawing attention to novel or unknown items related to background problems while facilitating *follow-up* by also providing related items. Moreover, recommender systems are increasingly designed to surprise the user with the *unexpected* (Iaquinta et al. 2008, 170).

Visualizations: These are visual representations that facilitate the display of complex data allowing users to identify key patterns, recognize trends, and determine anomalies (Heer et al. 2010). Visualizations may support the *trigger* element of serendipity by drawing attention through saliency (e.g., colour, size) or the meaningful juxtaposition of novel information. Visualizations have the potential to allow users to see and explore *connections* between information and resources they may not have otherwise made (Thudt et al. 2012). As well, visualizations also have the potential to facilitate the *unexpected* by helping users identify anomalies and novel patterns.

4. Conclusion

Serendipity is a complex phenomenon that requires a multi-faceted approach to its support. This poster identified three types of tools that have the potential to support different elements of serendipity identified in prior research. More research is needed to examine whether or not these tools contribute to a serendipitous digital environment and how best to apply these tools toward the facilitation of serendipity.

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