Interface Trends in Human Interaction, the Internet of Things, and Big Data

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INTRODUCTION

The Web and other networked-based services are primary vehicles for news and information dissemination. In 2008, Kohut, (2008, p. 21) reported that, "Thirty-seven percent of people today, including more than half of Internet users, obtain news online whereas ten years ago only 13% of the public and 35% of Internet users went online for news." More recently, Conaghan (2015, p. 1) noted that greater than 93% of men and 92% of women between the ages of 25-44 who went online in August 2015 engaged with newspaper content and half of this online audience use mobile devices (smartphones or tablets) to get news. A majority of major news websites are finding that most of their traffic comes from mobile devices rather than from desktop computers (Mitchell, 2015). Due in large part to mobile connectivity, people can obtain news instantaneously and become aware of worldwide events at any time of day or in any location around the world. It is estimated that there are over 7 billion mobile-cellular subscriptions (ICT, 2015), which enable people to access the news wirelessly on mobile devices, making news and information services portable, personalized, and participatory (Purcell, Rainie, Mitchell, Rosenstiel & Olmstead, 2010). The transformations taking place in news and information services magnify questions regarding the influence networked-based services have on newsreaders (Santana, Livingstone, & Cho, 2011). Researchers indicate that media are not solely transmitters of information, but they influence the process of thought (Carr, 2008; Purcell et al., 2010).

Online news content is frequently represented on digital displays as a highly dynamic interface characterized by a proliferation of media and interactivity that supersedes what is found in traditional informational sources such as newsprint or television news. Digital interfaces or points-of-contact through which people experience news and information services have never been so diverse or transformative. They present complex visual landscapes comprised of and supported by multimedia, communications, and networking technologies. Pervasive worldwide, they afford people an unprecedented degree of functionality and access to news, information services, and other people. The actions or ways in which users interact with modern interfaces are diverse and include behaviors such as swiping, scaling, dragging scrolling, hovering, and flipping (Sundar, Bellur, Oh, Xu & Jia1, 2014). Interfaces are a foundational technology that has helped instigate tectonic shifts in news and information consuming behavior, journalistic reporting, and news preparation and distribution, the impact of which is not fully understood.

In this chapter, I examine trends in today's news-orientated interfaces and the impact of digital interfaces on news consumption. Digital interfaces will be differentiated from traditional informational sources such as newspapers and television news. Additionally, I will explore several major characteristics or trends germane to today's news interfaces and their implications for how people consume news and, more generally, for how they transform information services: a) rapid innovation, b) interactivity, c) social, d) standardization, e) scale, f) media convergence and, g) the Internet of Things and Big Data.

TRADITIONAL MEDIA FORMS

Access to the news and one's understanding of it are influenced by interface elements. When people have contact with news, news organizations preplan or design the visual, auditory, conceptual, and functional aspects of that experience or point-of-contact. The manifestation of this design comprises an interface intended to help people access news and derive meaning from it. For example, when reading a newspaper, the printed document, type, content organization, headings, writing style, the proximity of page elements, the surrounding context, groupings and placement, and page numbering establish a context that guides readers' attention and provides them information about how to use the newspaper to glean information. One can imagine how readers would fare if a paper suddenly removed all headlines, page numbers, table of contents, and used disparate type. Some authors contend that the typographical design of newspaper makes reading easier and enhances comprehension relative to news content published on the web (Shafer, 2011). The inherent attributes of newsprint and television news media greatly influence how people access and comprehend news as well as how news is reported. Pipps, Walter, Endres, and Tabatcher (2009), for example, report research showing that content recall for television and radio news was lower than recall of textual information. Santana et al. (2011) found that news consumption varied based on the frequency, duration, and visual content of a news presentation. Access to a news story and learning from it is directly affected by many contextual features that make up the social and behavioral state of the environment in which a person acquires news (DeFleur, Davenport, Cronin, & DeFleur, 1992, p. 1011).

Characteristics of Television and Newsprint

Television broadcasts provide a vastly different news gathering experience compared to newsprint and online news. People adapt their behavior to accommodate the differences. A person may view a TV news broadcast in a room with other people or while engaging in some other activity. Television is a passive medium wherein viewers watch and listen as content gets delivered to them. They have limited physical engagement with the display interface as they endeavor to get news. A distinct separation exists between news content and the television interface. Broadcasts present short video-based stories sequenced linearly within a specified timeframe at a fixed location for on-air viewing. One's access to and the sequencing of such stories is controlled by the news organization. People can record TV broadcasts for archival purposes. Once recorded, the broadcast can be controlled by the individual.

Newspapers, unlike TV and radio broadcasts and online news, are tangible, highly portable, and can be easily archived by the reader. Although, today's mobile devices, web interfaces, and associated networking technologies, increase the portability of TV and radio broadcasts as well as online news. However, unlike newspapers, online content, while recordable, often requires software and hardware for recording or downloading. As people acquire news, there is a high degree of physical interaction with the printed medium or interface. The interface and content display are malleable - as people touch it, the display of content changes. Newspapers afford in-depth reading as well as active information search. Readers control the access to information. They navigate the printed document linearly or non-linearly, depending on their preference. News content is presented primarily as text and it is usually more in-depth compared to broadcasts that use visual and auditory stimuli to underscore messages. With newsprint, people bring established attitudes about what to expect and knowledge of newsprint conventions. Additionally, newsprint has a sense of permanence unlike online news, which is transient in that it appears and disappears without notice (Santana et al., 2011). Similarly, TV news broadcast are temporary unless recorded, but they

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