Role of Emotion in Information Retrieval for Entertainment (Position Paper)

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ABSTRACT

The main objective of Information Retrieval (IR) systems is to satisfy searchers' needs. A great deal of research has been conducted in the past to attempt to achieve a better insight into searchers' needs and the factors that can potentially influence the success of an Information Retrieval and Seeking (IR&S) process. One of the factors which has been considered is searchers' emotion. It has been shown in previous research that emotion plays an important role in the success of an IR&S process which has the purpose of satisfying an information need. However, these previous studies do not give a sufficiently prominent position to emotion in IR, since they limit the role of emotion to a secondary factor, by assuming that a lack of knowledge (the need for information) is the primary factor (the motivation of the search). In this paper, we propose to treat emotion as the principal factor in entertainment-based IR&S process, and therefore one that ought to be considered by the retrieval algorithms.

Categories and Subject Descriptors: H.3.3 Information Storage and Retrieval - *Information Search and Retrieval - Information Filtering*

General Terms: Theory

Keywords: Entertainment, Search, Information Retrieval, Information Science, Emotion

1. INTRODUCTION

The idea that *IR systems help searchers to overcome their information need (IN)* is a leitmotif since the early days of IR: the main task is to locate documents containing information *relevant* to such needs. Within this view, a searcher is considered as an agent that interacts with an IR system with the intention of seeking information [3]. The *information* can be defined as facts, propositions, and concepts, as well as evaluative judgements such as opinion [6].

In this paper, we argue that standard and dominant view doesn't sufficiently consider all the possible aspects of searchers' needs. Information Science (IS) researchers have argued about the existence of needs other than IN, and discussed their roles in the cognitive aspects of human beings and in IR&S behaviour. Examples include Wilson's interrelation between physiological, affective and information needs in IR&S behaviour [6], Kuhlthau's uncertainty principle [3]; these studies have investigated the role of affective and cognitive experience of a searcher in an information seeking process model.

Although these views better capture the searchers' mind compared to the traditional view, their accounting for the role of emotion is limited to its relation with cognition in the process of satisfying an IN in an IR&S behaviour, e.g., Kuhlthau's [3] model. Therefore, emotion plays a marginal role in these views in their modelling of needs. For example, in an IR&S scenario, where searchers' task is to find documents that are topically relevant to a given query (e.g., Iraq War), the emotion that they experience during the completion of this task influences their performance and satisfaction. Other examples are those of Arapakis et al. [1] and Lopatovska [4] that investigated the use of facial expressions and peripheral physiological signals as implicit indicators of topical relevance.

Others, e.g., Wilson [6], consider a more autonomous role for affect and define *affective need* as an independent need which can motivate an IR&S behaviour. For example, gathering information to satisfy affective needs, such as the need for security, for achievement, or for dominance [6]. However, there is no operationalisation of this *affective need* suitable for use in real IR systems.

In general, the current landscape of the role of emotion in IR&S behaviour is incomplete. Moshfeghi [5] argued that people use computers for individual as well as social purposes, such as entertainment, dating, getting to know people, finding 'friends', gaming, etc., which strongly indicates that users try to satisfy needs other than information ones. The study conducted by Elsweiler et al. [2] also supported this claim. The current views of emotion in IR/IS do not sufficiently explain these types of activities accurately, even though it is clear that users search for emotionally-rich documents from the Internet to satisfy these needs.

The pervasiveness of emotionally-rich content on the web, such as movies, music, images, news, blogs, customer review, Facebook comments and Twitter, highlights the demand for such contents, and, indirectly, their role in satisfying searchers' needs. Therefore, it is important to under-

stand the IR&S behaviour backed up by an entertainment aspect. The position of this paper is that emotion is a primary motivation (either directly or indirectly) behind an entertainment-based IR&S behaviour.

The rest of the paper is organised as follows: Section 2 discusses Kuhlthau's [3] model, followed by our approach in Section 3 and discussion and conclusion in Section 4.

2. EMOTION IN IR/IS

There are many theories and models that attempt to explain the information seeking behaviour. Kuhlthau's *information seeking process* model is one of the first and most popular models to investigate the affective along with cognitive and physical aspects of a searcher in an information seeking process. She proposes that people's feelings, thoughts and actions interact within their information seeking process. Kuhlthau's information seeking process model describes the searchers' common patterns of seeking meaning from information, to extend their knowledge state on a complex problem or topic which has a discrete beginning and ending [3]. The fundamental principle behind Kuhlthau's information seeking process is the *uncertainty principle* [3]. This refers to the existence of a cognitive state which causes feelings of anxiety and lack of confidence. Feelings of doubt, anxiety and frustration are in association with vague and unclear thoughts. The model shows that during a typical information seeking process, the thoughts of a searcher become clear and consequently their confidence increases and their feeling of doubt, anxiety and frustration decrease.

Although this model is an important step towards understanding the role of emotion in IR/IS, it does not encompass many important aspects of emotion in IR. Kuhlthau considers emotion/affect as a factor influencing the information seeking process, rather than a need in itself. Moreover, Kuhlthau's model is limited by making uncertainty central, i.e., as driving the seeking process while we argue that positive or negative emotion states, high or low arousal level, such as stress or boredom respectively, could also motivate users to engage in an information seeking behaviour. Therefore, a key limitation lies in the fact that the affective side of searchers is interpreted as only being a secondary motivational source for information need. In this paper, we consider emotion as a separate need. This is explored further in next section.

3. APPROACH

The goal of this section is to argue that emotion should be considered as the *primary factor* in entertainment-based IR&S behaviour: emotion can be considered as an individual need which can motivate searchers to engage in an IR&S process. The secondary factor of emotion refers to the fact that emotion (in relation to cognition) influences every aspect of the searchers' IR&S behaviour, and can thus influence the success or failure of an IR&S process. First, we will elaborate on emotion as a secondary factor in IR&S process.

As discussed in Section 2, the secondary nature of emotion in IR&S scenarios has been investigated for a long time [3]. The results of such investigations show that (i) participants experience a burst of negative feelings due to uncertainty associated with vague thoughts, leading them to recognise that they have an information need; and that (ii) there is a positive correlation between a successful information seeking process and a decrease in these negative feelings [3]. From

this point of view, not only is emotion a factor that exists throughout an IR&S process which aims to meet an IN, but also it can be considered as a need: the need to change negative feelings caused by uncertainty during the initiation phase (e.g. feelings of doubt, anxiety and frustration) to feelings of satisfaction and comfort.

When the emotion need of the searcher is to diminish the negative feelings associated with a lack of knowledge (i.e., an IN), the emotion need would be satisfied if the IN associated with it is resolved. However, in an entertainment-based IR&S process, the emotion need of the searcher is not associated with a particular IN, and is an autonomous need by itself. An example of such needs are the scenarios where the searchers are stressed and look at some clips that could help to relieve their stress, e.g., when searchers are seeking for funny clips in YouTube. Of course, one way of finding these clips is by looking at the popular (most viewed/highly recommended) videos. In such scenario there is no particular information need to be resolved, but only an emotion need.

From the above, we can now argue that emotion in an entertainment-based IR&S process acts as a primary factor, i.e. as an autonomous and important need.

4. CONCLUSIONS

In this paper, we explained the role of emotion in entertainment-based IR&S behaviour. We explained that in the normative view of IR/IS, the focus is on the satisfaction of searchers' IN. Although the role of emotion is acknowledged as a factor influencing the whole IR&S behaviour, its role was limited to the study of its influence on the process of satisfying an IN. However, emotion can be a source of motivation on its own for a searcher to engage in an IR&S process. Such scenarios have not been considered in the IR/IS community, and this motivated the definition of the emotion need concept. We argued that there are emotion needs that can motivate searchers to engage in IR&S behaviour which strictly speaking does not have an IN. The pervasiveness of the use of IR applications for the purpose of entertainment and the existence of emotionally-rich data on the web provides evidence that some information seeking behaviour can be categorised under other strategies than information need that can lead to better satisfaction of the searchers' needs. Given all these evidences, the conclusion of this paper is that emotion act as a primary factor behind entertainment-based IR&S behaviours. Finally, there is not much research about entertainment-based IR&S processes. This is due to the limitations associated with it, such as lack of datasets, evaluation methodology, metrics and procedure. An attempt to solve such limitations is a possible direction for future work.

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