Chapter 3
Forum Summarization to Support Tutor and Teacher in Group Interaction Management

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ABSTRACT
The process of summarizing information is becoming increasingly important in the light of recent advances in resource creation and distribution and the resulting influx of large numbers of information in everyday life. These advances are also challenging educational institutions to adopt the opportunities of distributed knowledge sharing and communication. The chapter presents a summarization system to support tutor in managing student communication and interaction within a learning framework. Results show the adequacy of the system in identifying a good content summarization and then in improving the efficiency and effectiveness of the context in which summarization can be integrated.

INTRODUCTION
The Internet has grown beyond merely hosting and displaying information passively. It provides easy access for people to share, socialize, and interact with one another. Information displayed and exchanged between people are dynamic, in contrast to static information depicted in the older age of the Internet.

Forums are web virtual spaces where people can ask questions, answer questions and participate in discussions. The availability of vast amounts of thread discussions in forums has promoted increasing interests in knowledge acquisition and summarization for forum threads. Forum thread usually consists of an initiating post and a number of reply posts.

Text summarization has been an interesting and active research area since the 60’s. The definition and assumption is that a small portion or several keywords of the original long document can rep-
resent the whole informatively and/or indicatively. Reading or processing this shorter version of the document would save time and other resources (Zhou, 2006). This property is especially true and urgently needed at present due to the vast availability of information.

Moreover, the Web is moving toward a social place and increasingly producing new applications: there has been a shift from just existing on the Web to participating on the Web. Community applications and online social networks have recently become very popular, both in personal/social and professional/organizational domains (Kolbitsch, 2006). Most of these collaborative applications provide common features such as content creation and sharing, content-based tools for discussions, user-to-user connections and networks of users sharing common interest, reflecting today's Web 2.0 rich Internet application-development methodologies. Concept-based systems to facilitate knowledge representation and extraction and content integration are obtaining a great deal of interest (Bighini, 2004).

Concept-based approach to represent dynamic and unstructured information can be useful to address issues like trying to determine the key concepts and to summarize the information exchanged within a personalized environment, for example within a technology-enhanced learning system. Indeed, a virtual learning system is not only a set of contents anymore, but also may include a collaboration spaces and tools such as forums, chats or shared document areas. To support automatic analysis of learner's progress in terms of the knowledge structures they have acquired, different methodology can be used. For instance, it could be useful to automatically construct concept maps or domain ontologies based on the messages posted to online discussion forum.

**Interaction in Learning Environments**

The amount of interaction in technology-enhanced learning systems appears to be an important element of learning effectiveness. Wagner (1994) defined interaction as an interplay and exchange in which individuals and groups influence each other. Thus interaction focuses on the interpersonal behaviors in a learning community. Gunawardena and Zittle (1997) argued that on-line students can create social presence by projecting their identities and building on-line communities through text-based communications alone.

Rovai and Barnum (2003) also provided evidence that students' perceived that learning from on-line courses was positively related to quantitative measures of course interaction. However, judgments about the relative importance of the two interaction variables are difficult because these variables are correlated. Nonetheless, only the active interaction measure, representing for example the number of student message posted to discussion boards or the number of participation in forum thread, was significant. This finding affirms the importance of providing opportunities for on-line students to learn by active interaction with each other and with the instructor (Zirkin, 1995). Consequently, educators should develop and include highly interactive material in distance learning and encourage students to participate in on-line discussions. Findings also suggest that passive interaction, analogous to listening to but not participating in discussions, was not a significant predictor of perceived learning in the present study. Therefore, using strategies that promote active interaction appears to lead to greater perceived learning and may result in higher levels of learner satisfaction with the on-line learning environment. The quality of interactions is another important aspect of communications that should be the topic of further research and goes over the objective of actual work.

So, it is necessary to support tutors in order to manage the communication services provided by the community and to monitor student interactions. This aspect has been largely neglected in the literature. However, supporting tutors is very important to make learning communities effective.
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