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学 位 論 文 題 目　　MODELING　AND　SERVICES　FOR　ADAPTIVE
　　　　　　　　　COLLABORATIVE　DELIVERY　OF　ANNOTATED
　　　　　　　　　MULTIMEDIA RESOURCES

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Adaptive systems are becoming essential for supporting the overload and the diversity of digital documents to be archived, retrieved and disseminated. They indeed represent the most promising solution for individuals to be able to handle the amount of data, which they are daily flooded with during their professional activities or on their personal devices. However, providing adaptive management of heterogeneous resources remains an important research issue, as it requires extensive and global environmental knowledge management to be effective. Communities, as they are sharing interests and accesses to resources, present very interesting characteristics that enable systems to deliver automated and personalized services; the scope of such processes being to take advantage of collaborative involvement in order to provide relevant knowledge management to users, to ensure the consistency of data manipulation, and to improve the distribution of resources within communities.

This dissertation presents a collaborative information management framework dedicated to the personalized delivery of multimedia documents. We first propose an Information Modeling for Adaptive Management (IMAM), which is an innovative set of algebraic structures making it possible to categorize and manipulate any piece of environmental knowledge that is useful for an enhanced delivery of data. In addition, this modeling is the generic basis for the definition of operators and services in collaborative environments; these functions rely on contextual information for personalizing the retrieval and the distribution of multimedia documents. Then, after ensuring an efficient storage management of annotations in XML with a mapping to the Extended Binary Graph data structure, we define a powerful indexing strategy that makes the retrieval of annotations faster. Finally, we design adaptive services based on IMAM's formal modeling. These services comply with complex distributive models structures such as Peer-to-Peer and perform personalized query optimization and data placement in collaborative environment.

The background research of Jerome Godard's thesis is related to the multimedia documents collaborative management. In interconnected environments, users access to heterogeneous multimedia documents with heterogeneous devices for several purposes such as multimedia acquisition, multimedia indexing and delivering. Despite the large numbers of results from the research area related to multimedia documents management, little progress has been made in the personalization aspect of the distribution of shared data. Nowadays, users involved in communities typically arrange their multimedia collections in file systems which provide poor annotating mechanisms and hierarchical directory structures for organization and searching. There are many issues which make the collaborative management of large multimedia collections quite inefficient. The PhD thesis solves the problem related to the lacks of global approaches that consider the knowledge management from the acquisition to the dissemination. In fact, information systems do not enough take advantage of metadata until now, and great opportunities have been missing to improve their knowledge management tasks. Furthermore, this model aims at improving the knowledge representation in order to enhance the delivery of data between communities' members. Jerome Godard's PhD thesis introduces an innovative model named IMAM (Information Modeling for Adaptive Management). The main contribution of the thesis as part of IMAM (Chapter 2 and Chapter 3), thesaurus-like extensible categorization tree, is to provide a global resource description, a categorization, and a manipulation framework that fits XML and enables us to enhance the collaborative distribution of information, by capturing a four layer knowledge (users, communities, devices, and resources). They are separated into two categories (the resource description for multimedia documents, and the profile for users, communities, and devices) that enable the information capture and its categorization through metadata. Two important research results are the specific services (chapter 8 and chapter 9) created based on IMAM: the viewpoint, which acts as a query optimizer, and an authoritarian data placement, which dispatches the multimedia documents on the community's devices according to the attractive potential that resources have for each user. Partial implementation of the data placement that focuses on the relevance evaluation part of the service and present some preliminary results of experiments that are being performed. This dissertation presents an initiating approach that aims at answering some fundamental challenging issues in this area by focusing on users satisfaction.

The definition and design of authoritarian placement of data for communities is one of the main contributions of this dissertation. It represents a unique approach to handle resources distribution within communities by automatically delivering interesting and

appropriate content to people. Furthermore, in chapter 6, the thesis also reviewed the usefulness of indexes dedicated to XML and the need for new strategies. Jerome Godard investigated the existing structural indexing methods. Then he described his proposal for a multidimensional indexing operator based on EBG (Extended Binary Graph). From an innovation point of view, the thesis introduces automated placement processes, which fills some gaps in resources for users; it considers and distributes available information about users that are hypothetically or potentially missing. Finally, the thesis provides a format language that can be understood by users as well as by software applications, and hardware devices.