

# Chapter L

## Design and Implementation of a Mobile and Portable Lifelog Media System

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### ABSTRACT

*Lifelog media system stores and manages users' everyday experiences in the form of multimedia data. To build such a system, we require an integrated framework for capturing the experiences to multimedia data, storing and managing those data, and also presenting the data to the user in a user-friendly way. Due to the mobility of the user, we built a mobile framework that includes wearable devices that enable the user to capture experiences easily, and a Web-based management system that can be presented anytime and anywhere using Web interface. In this chapter, we provide solutions for some issues that emerge in this system (such as mobility and user friendliness), mostly on the database performance.*

### INTRODUCTION

Recent advances in digital recording technologies such as camcorders, digital cameras, and voice

recorders are basically intended to store the user's experiences into digital data so the user can review them in the future. These recorded data are used in various applications, but the essence of

the application is human memory enhancement to help humans remember what has already happened in the past.

Usually people use recording devices to record only on special occasions (e.g., birthday parties, graduations, etc.) in order to remember those occasions in the future. However, due to the advance of multimedia and storage technology, it is now feasible to record even ordinary everyday occasions so the user cannot miss unpredictable events that happened in everyday life. The system to record these everyday events to digital data can be called lifelog system.

Several projects have been commenced to develop this kind of application. The term *lifelog* is introduced by the name of a project from the Information Processing Technology Office of the Defense Advanced Research Projects Agency (DARPA), United States Department of Defense. DARPA cancelled this project in 2004 because it received too much criticism in privacy issues. However, the idea of storing everyday experiences still continues to be a prospective research field for various applications.

This chapter proposes the design and implementation of a framework for a lifelog media system (later mentioned as Lifelog Media system) to capture, manage, and retrieve user experiences easily. Issues that emerge in this framework will be explored and are given possible solutions.

In the next section, we describe the background of this research, including the related research works. Then we will discuss the architecture of our framework in the following section. In the subsequent section, we present the issues that emerge in our framework as well as the solutions. In the last sections, we predict the future trends in this research field and conclude the chapter.

## **BACKGROUND**

The lifelog system is intended to store everyday experiences of a user into a database system.

The objective of the lifelog concept is to be able to trace the “threads” of an individual’s life in terms of events, states, and relationships (DARPA, 2003). Generically, the term *lifelog* or *flog* is used to describe a storage system that can automatically and persistently record and archive the useful informational dimension of an object or life experiences of the user with a particular data structure (Wikipedia, 2007).

This kind of system involves capturing a great amount of personal experiences in the form of digital multimedia. To manage those data systematically so the user can efficiently retrieve useful experiences whenever he or she needs them, an efficient metadata database management system enabling user-friendly search of the experience using human conceivable cue is essential.

Several works have been studied in lifelog media (Aizawa, Tancharoen, Kawasaki & Yamasaki, 2004; de Silva, Oh, Yamasaki & Aizawa, 2005; He, Xiang & Shi, 2005). In those studies, the authors are interested in the concept of digital logging and the conceptual implementation of their lifelog media systems.

Takahashi, et al. (2004) especially concentrated on the data representation and introduced multilayer data interpretation to represent human interaction. This multilayer data interpretation is similar to the approach in this research, but this research uses automatically generated metadata from various wearable sensors. This enables users to search the desired media using a wide range of information.

To manage the enormous lifelog media data efficiently, the system requires special database system with a special indexing mechanism. Tusch, Kosch & Blöszödorményi (2000) introduced VIDEX, a generalized model for indexing video that was applied in SMOOTH (Kosch et al., 2001) to manage soccer game records. Here they use RDBMS to implement the database, while other projects such as OpenDrama (Celma & Mieza, 2004) use Native XML Database (NXD).

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