DEVELOPMENT OF A CD-ROM-BASED MULTIMEDIA-APPLICATION IN AN OPEN SYSTEM ENVIRONMENT

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Abstract

This experience report describes the pre-conditions and methodology for the development of a CD-ROM-based multimedia application. By means of a prototype application different aspects and problems are discussed that must be considered during the development of a CD-ROM-application. Finally, this paper will present possible scenarios for CD-ROM-based information systems in tourism.

Keywords: CD-ROM, CDTV, multimedia, information systems, man-machine-interface, project management, open systems.

1. Introduction

The successively increasing computing power and storage capacity of low-cost computer systems made it possible that applications could be realized which integrate different media such as text, image, graphics, voice, music, computer animation, or video. Multimedia applications could therefore be considered as a real alternative to classical means of sales support such as color brochures, catalogues or videos in tourism. Their strengths lie mainly in the interactivity and dynamics of information presentation. The aim of this work was to get a deeper understanding of the CD-ROM development process by putting special emphasis on project management and technical requirements.

2. Prototype-Application as Object of Analysis

By the help of a prototype application, answers to questions that may appear during the development of CD-ROM-based multimedia applications were to be worked out. The aim was to implement several partial aspects of a possible *point-of-information-system* (pois) for the Zurich Airport in cooperation with the airport management. This prototype application integrated as much multimedia elements as possible, like text, image, animation, video, voice, or music as possible, and use a CD-ROM as a storage medium. Such a *pois*, in its functionality as an information store, had to offer different kinds of requested information about the Zurich Airport to arriving tourists and businessmen. This system's main feature should be in its easy of use and in a short training period for inexperienced users. A further goal was the development of a consistent user-interface. An adequate design of the user-interface can be achieved by respecting user-interface design guidelines during the application development process. Some of such design guidelines are described in [1] or [2]. To make the prototype application available to a wide range of users a low-cost hardware platform was chosen. Another requirement for the development environment consisted in its device independency and, therefore, portability across different system platforms.

3. Open System Environment as a Development Platform

The development of advanced multimedia applications needs adequate environments for experimenting with different media types, representations or formats and for working out new multimedia concepts. An efficient integration of new IO-facilities, workstations and network components requires an open system environment that is mostly realized by a local area network. The openness of a system consists of features like portability, extendibility or transparent data access. Important functional building blocks in the development of CD-ROM-based multimedia applications are data acquisition, data processing, data format conversion and authoring of the target application with an authoring system. To support data acquisition and processing, self-written or externally acquired software tools and different input devices, such as a color scanner or a video camera, are used. The manifold media types and data to be processed require a functionally flexible hard- and software environment. Many development environments combine multiple hard- and software tools to accomplish these functional requirements for the development of multimedia applications. During the implementation of the described CD-ROM application, IO-devices and UNIX workstations have been connected through an Ethernet network. The workstations served for data acquisition and data processing. A low-cost personal computer was also connected to this network. After processing, data was transfered to this personal computer and integrated with a self-written authoring program to a multimedia prototype-application. Finally a CD-ROM player was used to verify the produced master-CD before CD-ROM production.

4. Methodology

The methodology for the development of a CD-ROM-based multimedia application closely follows a standard software life-cycle model as described in [3] or [4]. Essential for the success is a systematic proceeding and permanent keeping in view of the target system's requirements during the development process. The methodology shown in figure 1 was used as a development model. The different development phases will now be described.

4.1 Requirements Analysis

The requirements analysis phase consists in the clarification of technical constraints for the development platform and the target application system. Additionally, the necessary personnel assumptions for the implementation of a CD-ROM-application have to be organized. After a detailed evaluation of existing CD-ROM systems, CDTV[1] of Commodore was defined as the target system. This decision was made because other platforms would have meant to high investments for the development environment. The development platform was an Amiga 3000 with 2.2 GB harddisc memory, 18 MB RAM and a TCP/IP network adapter card for networking. The infrastructure of a multimedia laboratory served mainly for data acquisition and processing of digitized pictures. A main focus during requirement analysis was the make-or-buy decision concerning the authoring system. Because of the heavy resource requirements of existing authoring systems for the Amiga platform (e.g. huge memory consummation, poor performance in information access, run-time player license fees for each application copy), a new authoring program was implemented. Similar problems of existing authoring systems caused a new implementation of the authoring system for the development of "Multimedia Graubünden", a tourism information system described in [5].

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[1]Commodore Dynamic Total Vision: multimedia system for audio and video discs (Commodore, Inc.)