DEVELOPMENT OF INFORMATION SYSTEM FOR MEDIA CONTENT MANAGEMENT

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Abstract:

Medium and large companies are increasingly faced with the need to maintain a single internal information background - a certain level of awareness of employees about the activities of the enterprise. The usual schemes - e-mail newsletters, corporate publications, wall newspapers, bulletin boards, etc. - often do not provide the expected efficiency. In this regard, the relevant processes need to be automated. In this paper the development of an automated information management system of media content of a visual nature is carried out. This system is focused on the use of a large number of people, potential buyers of goods or services. The main purpose of the developed information system is to provide a convenient way of operational management of advertising media content of a visual nature.

Keywords:

Information system, media content, managenent.

ACM Computing Classification System:

Software system structures, business process management, management of computing and information systems.

Introduction

Modern society is a consumer society. The life of most modern people can not be imagined without the Internet, television, radio, mobile phones, supermarkets. And everywhere we are surrounded by advertising. Advertising is everywhere - contextual advertising is placed on the websites, advertising spots are shown on television, advertising stands are installed on the streets of cities, and advertising is shown even in applications for smartphones. A special place is occupied by advertising in shopping centers. Every visitor to a shopping center is a potential buyer of a product or service, a person who is determined to purchase one or another product or service. That is why it is important to correctly and in time present to such a person a description of a product or service. This may be an audio recording, a promotion, a bright sign, or a video clip that plays on a large liquid crystal screen at the entrance to the point of sale.

In this paper, we are developing an automated information system for managing media content of a visual nature. This system is focused on the use in places where a large number of people, potential buyers of goods or services. The main purpose of the application of the developed information system is to provide a convenient way for the operational management of visual advertising media content.

To achieve this goal it is necessary to perform the following main tasks:

1. To review the leaders of the Russian and foreign markets of centralized media content management systems.
2. Compare the possible ways of delivering media content to the end nodes of the software package, and also select the most promising technology from them.
3. In accordance with the chosen method of content delivery, develop an automated information system architecture.
4. Analyze the available database management systems and select the most appropriate one.
5. In accordance with the chosen architecture, execute the software implementation of the information system modules.

1 Media Control Systems in Advertising

The word advertising comes from the Latin reclamare, which means "to approve, shout, protest."

Advertising is any information disseminated in any way, in any form and using any means, addressed to an indefinite circle of persons and aimed at drawing attention to the object of advertising, the formation or maintenance of interest in it and its promotion in the market.

Digital Signage is a technology for presenting information through electronic media installed in public places.

This technology is mainly used for advertising. Advertising messages distributed by digital signage, as a rule, aim to reach the target audience in the right place for contact and at the right time [1].

The advantage of advertising messages delivered by digital signage technology over traditional static forms of outdoor advertising in a more simple and fast replacement of content, dynamic content, adaptability of the message to the environment and the audience, including interactive. Among the disadvantages of the technology, it should be noted the technical complexity and, therefore, high initial costs.

The decline in prices for liquid crystal and plasma displays has led to a significant increase in the number of implementations of Digital Signage solutions. The determining factors in choosing a display are size and cost. The size of the display should provide a comfortable perception of information by the target audience [2].

Content is played on displays from at least one playback module. This can be either the software embedded in the display or an external device. Existing software and hardware solutions provide various ways to manage and play content, starting with simple media players, looping video, ending with national-scale distributed networks, managed from one center [3].

To date, among the software systems Digital Signage of the Russian development, designed for promotional activities, the obvious leader in the declared functionality and the number of implementations is the software company KINOMATIKA.

Software of the same name entered the market in 2007 after 5 years of development.

Currently, software systems based on KINOMATIKA are implemented in more than fifty cities of Russia and neighboring countries. According to official information posted on the manufacturer’s website, 670 software licenses have been sold.

Today, Scala is the most successful and popular among the foreign software manufacturers for Digital Signage.

The history of Scala dates back to 1987. Digital Vision AS was founded in Norway this year. The company specialized in product development for cable television stations. The software was intended for the first graphics-enabled computers, Commodore A.

The following modules are part of the automated information management system for media content:

1. Database server - database server of the program complex. Stores information about the quantitative and qualitative characteristics of the modules used. It stores information about the distribution of content, its playback time, content conversion profiles. The stored information provides for reading and editing the "Content Management Server".
2. Content Management Server - a module responsible for the interaction of "Content Distribution Services" with the database of the software package. Serves as a business logic module when working with new and existing content. Converts downloadable content in accordance with the specified profiles.
3. The content distribution service is a software module whose task is to launch the required number of "Players", distribute them to the displays and transfer information about what and when the "Player" should be displayed.
4. Player - a module that is directly responsible for displaying content. Receiving a command to download content from the "Content Distribution Service", connects to the "Content Server", downloads the specified content and displays it to the next "Content Distribution Service" command.
5. The content server serves as a file storage of content. Provides access to content by URL. Formation of the URL is produced by "Content Management Server".

The scheme of system we can see in Fig.1.

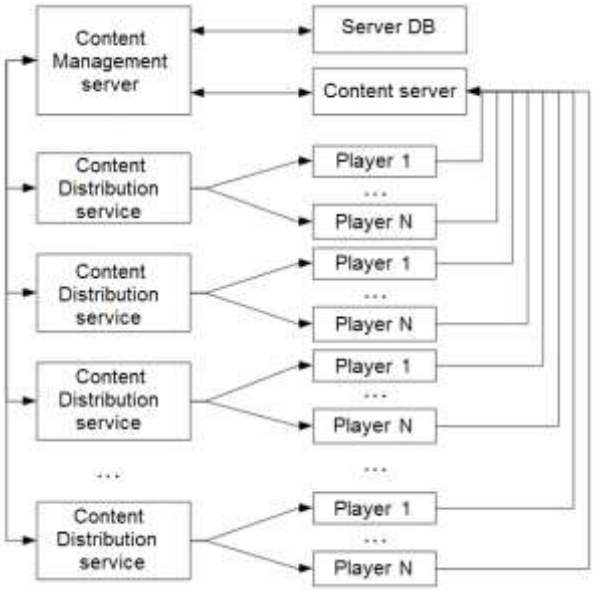

Fig.1. Scheme of the developed system.

Currently, there are a huge number of information transfer protocols. However, not all of them are suitable for the transfer of media content. For example, the XMPP protocol is great for sending text messages, but its use for streaming video is impractical because of the limitations of the protocol architecture.

The main object of HTTP manipulation is the resource pointed to by the URI in the client's request. Typically, these resources are files stored on the server, but they can be logical objects or something abstract. The peculiarity of the HTTP protocol is the ability to specify in the request and response the way of representing the same resource according to different parameters: format, encoding, language, etc. (In particular, the HTTP header is used for this.) It is thanks to the possibility of specifying the method of encoding the client message and the server can exchange binary data, although this protocol is textual.

Taking into account the fact that not only video information but also static images will act as content in the information system being developed, while further development it is planned to transmit HTML text, the choice was made in favor of the HTTP protocol [4].

The following requirements are imposed on the database management system of the application:

1. The number of failures, data loss should be minimal in the practice of using DBMS by other projects.
2. High request processing speed.
3. Minimum license cost of the most functional edition of the DBMS.
4. Maximum compliance with the standards of the structured query language SQL.
5. Low requirements for hardware.
6. Platform independence.
7. Transaction support.

Considering the above requirements for the database management system, the following DBMS are selected as candidates:

1. Firebird 2.5.2
2. MySQL 5.5.37
3. PostgreSQL 9.3.4
4. Oracle Database 12c Express Edition

Taking into account the fact that the developed warehouse accounting information system implies long-term use at the enterprise and the expected daily number of requests to the database server is about 10,000, it can be argued that the only database management system that fully meets the requirements is the PostgreSQL 9.3.4 DBMS.

The choice of programming language in the development of an information system must be compared with the tasks of the information system and the requirements for the speed of system development. You should also be guided by the experience of operating software written using this programming language.

Considering the requirements for the system, high-level programming languages such as Java and Qt, the C ++ language framework, are suitable for the implementation of the problem [5].

Java is a high-level, object-oriented, highly typed programming language developed by Sun Microsystems (later acquired by Oracle). Applications written in the Java language are translated into bytecode that runs inside a special virtual machine. Thanks to this approach, a Java application can be run on any platform for which there is an implementation of the Java Virtual Machine, without recompiling the application. The official release date of the Java language is May 23, 1995.

Over the past 19 years since the first release, Java technology has gained immense popularity and is widespread in any area of computer technology - browser applications embed [6]. In Fig.2 we can see he main application window.

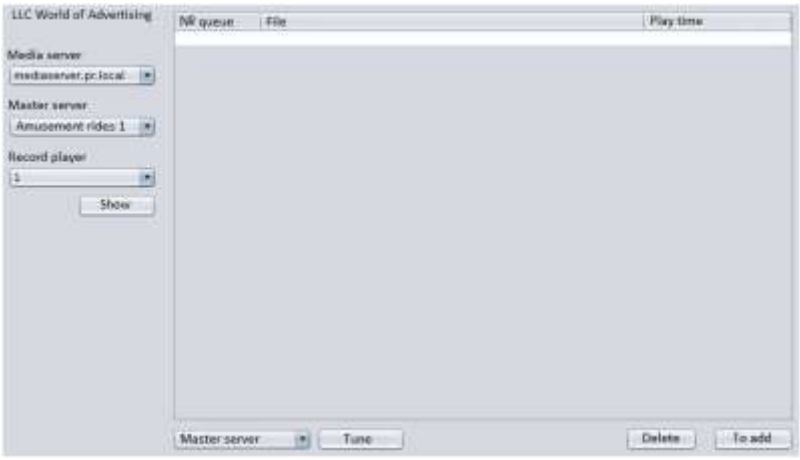

Fig.2. The main application window.

When you first start the information system is known only "Media Server". Therefore, it is necessary to add information about available content distribution services. To do this, in the drop-down list next to the "Configure" button, select the "Master Server" item and click the "Configure" button. A window will appear on which to enter information about known content distribution services. The view of this window is shown in Fig.3.

Fig.3. Form for adding information about distribution services.

After entering information about content distribution services, you must enter information about players. The player is tied to a specific content distribution service.

To enter information about the players in the drop-down list next to the "Configure" button, select "Player" and click the "Configure" button. The player information entry window will appear on the screen. The view of this window is shown in Fig.4. After entering all the necessary information, you can start working with the system.

To get information about the list of files played by a particular player, in the Master Server drop-down list, specify the content distribution service of interest we can see in Fig.5.

In the "Player" drop-down list, select the player in Fig.6.

In the right part of the main program window, a tabular view displays information about the list of playable files, the order and duration of playback. View of the information table is presented in Fig.7.

Fig.4. Player Add Form.

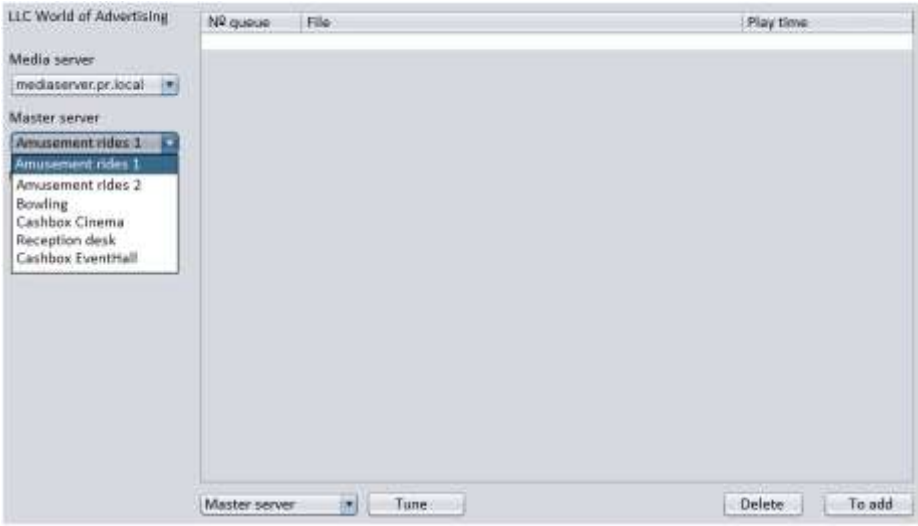

Fig.5. The choice of content distribution service.

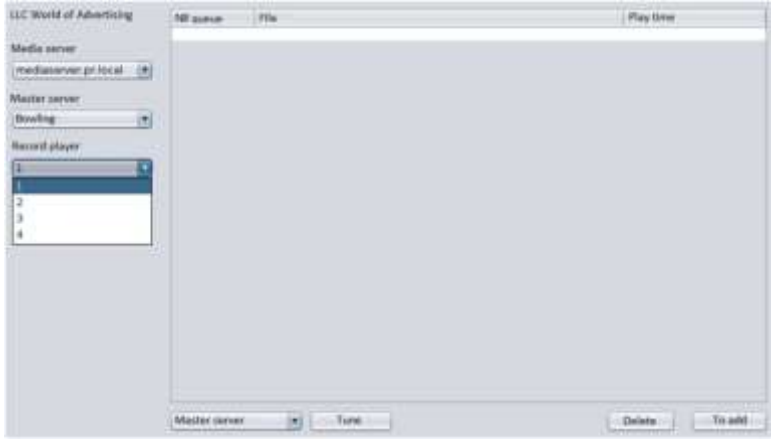

Fig.6. The choice of player.

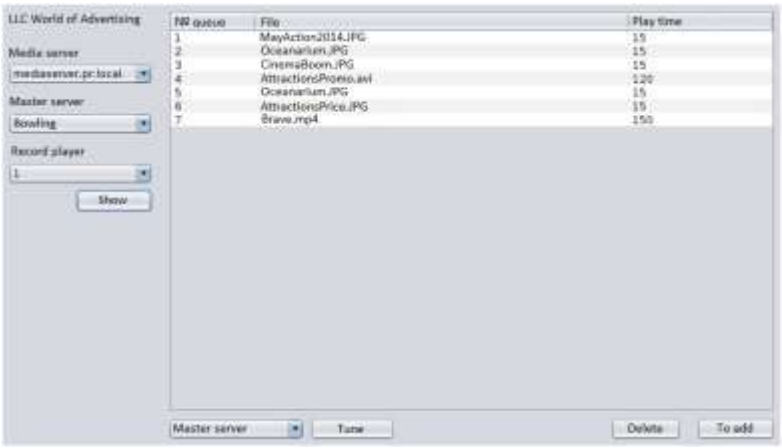

Fig.7. Information about the content being played.

Conclusion

In this paper, an analysis was made of the modern market for automated content management systems used in advertising activities. In the course of the work, the development of an automated information management system for visual media content was carried out.

The development of an automated information management system for media content is made in a high-level Java language using the PostgreSQL database management system as a data warehouse. The content playback module is made in high level C ++ language using the Qt framework. Nginx web server was used as a storage and distribution system for content.

The developed software meets the requirements - performs the assigned functions in full, is cross-platform, is not demanding on resources, has a low cost of implementation and operation.

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