INFORMATION SYSTEM FOR AUTOMATING THE RADIO BROADCASTING

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Abstract. This publication presents an information system for automating the processes in modern radio broadcasting. The system is built up by separate program modules which as a whole realize the entire control and monitoring of the relevant activities.

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1.Introduction

Lots of works nowadays are dedicated on the development of software systems for automating of radio broadcasting. Amongst the most famous systems [1] are the "Dalet" of the homonymous French company, the system of "Radio Computing Services" (RCS) – U.K., "DAD" of Enco, "Numisys" of Studer, "Nautilus JukeBox" of the Hungarian "Nautilus Audio & Vidio Solutions." They all work on the basis of sound cards "Digigram". Compression contributes not only for increasing the volume that can be recorded per unit of disc space, but also for accelerating of the play owed to the decrease of the data flow. Most systems have attached programs for processing of sound files. All systems are

operated under the control of Windows.

High price appears to be a basic disadvantage for the above listed systems.

The necessity of such software systems emerged recently with the development of private radio stations during the last several years.

The information system described in this article was developed in the medium of the objective-oriented programming DELPHI 4.0 [2, 3, 4]. It is built up by modules (programs), which as a whole realize the entire control and monitoring of radio broadcasting. The modules run under the control of Windows and use common data bases. Their communication is implemented via the functions of Microsoft Network. The system has different access levels.

2. Architecture of the information system

The system consists of 5 separate modules:

- for registration of sound files, composing of musical play lists, following of radio- broadcast, data storage;

- for registration of the advertisement spots, announcements and the schedules of their emission, output of statistical data for distribution of broadcasting time in a tabular and graphical form, issuance of certificates for the emissions;

- for input of texts for various news emissions and service information;

- for automated real time broadcasting of the play lists and output of news emissions for reference hours and headings;

- for adjusting of the system, registration of users and their access levels.

Since the system does not process sound files, the used text files are compressed via Microsoft ADPCM compression (1/4 without quality loss).

The retrieval of statistical data for future advertisement broadcasting allows the following advantages: the advertisement manager can make a better distribution

of ad spots; the financial manager can anticipate future needs of ad time sales or decreasing of the sales depending on the free ad time in different time zones.

When an user starts the system he has to enter his identification sign and password. The system maintains users' data base and their titles for operation with each module as a whole, as well as the access levels within the module itself. Fig.1 shows the principle scheme for assigning the functions required for implementation of a broadcasting. Some working sites presume operation with more than one module.
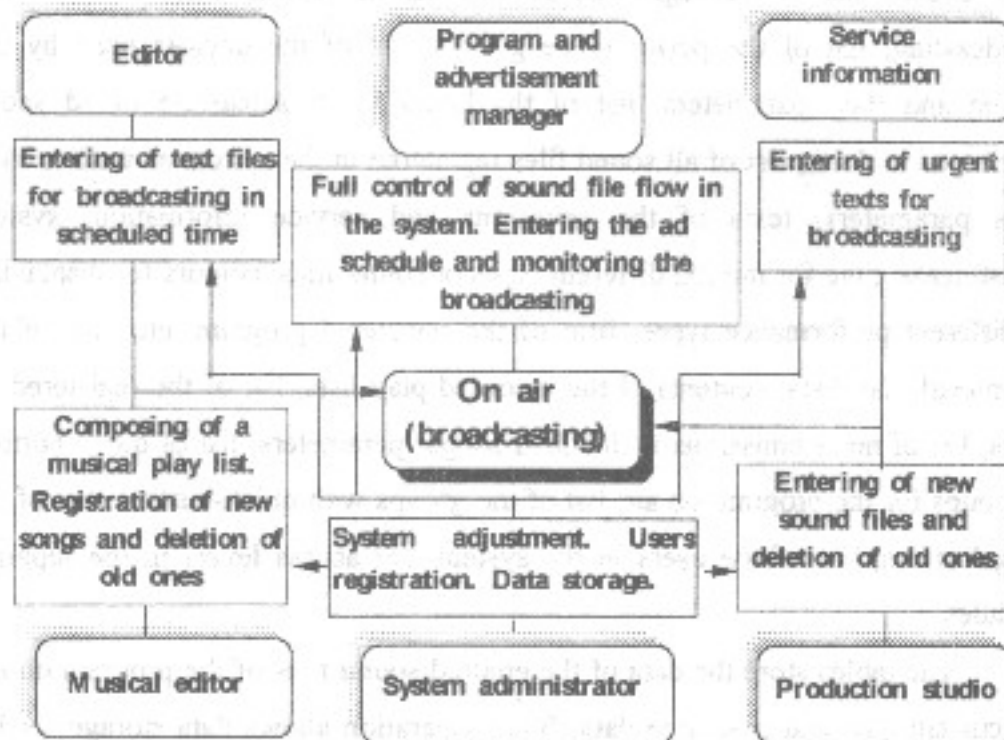

Fig. 1

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3.Arrangement of data bases

A very important point for system designing is building up of a data base structure. The used program language is *Paradox*, not only because of the great number of type fields which it maintains but also for the possibility of table sorting by one key field or several key fields simultaneously.

The following data types are used, distributed in tables: date and time data of user's start and exit in/out of different system modules; list of advertisement-order clients; list of the registered performers; list of the dates for ad spots broadcasting; list of the performance groups; list of the devices used by the system and their parameters; list of the hours for broadcasting of ad spots, distributed in dates; list of all sound files registered in the system as well as their main parameters; texts of the emissions and service information; system adjustments: time for mixing different types of sound files, colours for displaying of different performance types, firm of the registered program, etc.; list of the completed play lists; contents of the recorded play lists; list of the registered ad spots; list of news emissions with added songs' parameters; list of quick-buttons in groups for the program on air; list of the groups with quick-buttons; list of the songs' styles; list of the users in the system and access levels in the separate modules.

The tables store the data of the emitted sound files of the program on air, i.e. current data and past time data. Such separation allows data storage for big periods of time without affecting the order of the daily performance.

To facilitate and accelerate the data retrieval and sorting there are fields in some sub-tables duplicates of fields in the main tables. In order to reduce the possibility for non-authorized access each table is protected with a specific password.

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Besides the global data base the system comprises a local data base, used by the module on air and loaded on the computer set up on air. The local data base represents a simplified version of the global one. The recorded information in it is only the data used by the module on air. Filling up of the local data base is implemented by the remaining modules of the system, each of them updating the information only in its sphere, i.e. the ad module records the data for the ad play lists, the news module - the data for the news emissions, etc. Only the users' data is retrieved from the global data base for safety reasons.

Each module is restricted to use definite tables of the data base.

In physical aspect the local data base of the module on air comprises files with random access and text files. Being started the module loads these files in the memory and updates them dynamically at the receipt of messages from the different modules for data re-freshing. The structures used for that purpose are defined in the system library. Loading of the data base in the memory tends to minimize the disc operations, thus accelerating the module operation. Some file structures copy the structure of the corresponding table in the global data base. The emission file is a text file and it contains the names of the emissions.

For filling the program reports in the program is used Object Linking and Embedding (OLE). With the help of Windows function "Create OLE Object" is possible to create an object of Word Basic. The latter is used for filling of the templates preliminary created in Microsoft Word. After filling the template the user can edit, record or print the product file. Thus, the user has the possibility to modify the report, without any changes regarding the report form, i.e. its emblems, addresses, telephones, etc.

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4. Functional properties of the modules

4.1 "Adjustment" module

This module serves for adjustment of the whole system, for registration, deleting and editing of the users in the system, as well as their rights.

It indicates the rights for operation with the different modules and the allowed actions in them. The administrator has all rights. The registration of an user's entry and exit from different modules can be deleted. Information is displayed revealing the time when the system was accessed by different users.

The active discs are adjusted interactively. All devices are assigned with network names. The following parameters can be set up: alternative of the device - if a receptor or a source; if stored or not; if the device has a reserved site or not.

4.2 "News" module

This module enters the texts of the emissions, kinds of emissions, hours of broadcasting. It is possible to make an overview of texts of past dates, as well as texts of a definite date, or texts, entered via a filter. The time needed for reading a text can be automatically computed enabling the editor on duty to decide how long the broadcasting can last. The program registers who and when has entered the text or edited it. After corrections are being made each text is recorded for broadcasting in the data base of the computer on air. It is possible to edit the emissions, as well as to update them thoroughly, nevertheless of the fact that they may be intended for the current or future date.

4.3 "Registration of musical files and composing of play lists" module

This module is operated by the system administrator, the program and musical editor, who in fact realize the greater part of the system control using it. The module registers all retrieved musical files, indicating the file's type, its group and the way of registration, i.e. through copying or moving it. The selection of the files can be made by all accessed network devices, but the default device is the source indicated in the program for adjustments.

For registration it is required the program on air to have been started. After confirmation receipt follows the registration itself. In case there is not sufficient free space on the active discs, an error message is displayed and registration is canceled. Should the performance group is not indicated on registration, the performance will be invisible for the program on air and could be emitted only if it is entered in the play list.

The module allows an overview of the active, forbidden (in case of a temporal prohibition for broadcasting), damaged (texts could not be retrieved for some reasons or have a damaged structure) and deleted performances.

The module gives a possibility for retrieval of performances by a definite parameter or a group of parameters. The following operations are allowed: performance **audition; retrieval** of performance by definite parameters; performance **testing;** change of name; **change** of the performer; change of the group; **nullifying** of the performer; **new registration**, valid only for the deleted and damaged performances, i.e. the sound file related to the performance is renamed; **deletion** of the performance, i.e. deletion of the data and the sound file related to it; file **copying** - copy of a sound file for additional processing or creating of a copy; deletion of a sound file, i.e. the file related to the performance is deleted (it is marked as being deleted); **prohibition** - forbids/permits the broadcasting of a given performance; **displaying** of statistics for the space occupied by sound files, registered in the system and their distribution by types;

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updating of the data in the table.

The module offers the possibility to overview the performances, set be the program on air. The user can chose an overview period by entering the starting and end date as well as the time zone. Also, the performances can be filtered by name (partial or completely indicated name), by performance type and by the host. The list is sorted in chronological order. There is a possibility for: updating of the list; data transferring after played performances on the computer on air; display of statistical data for a chosen period; making a report or a certificate for the period.

There is a possibility for entering additional data of the songs. A list of all described songs is given to facilitate the user. The description of the song can be made before its registration as a sound file. After registration of the sound file it is necessary the song data to be linked with it.

The service functions are: **updating** of the local data base in the computer on air (performances, groups, play lists, thorough renewal); data base **storage, de-storage** of data, **deletion** of records, **removal** of some performances from the table with performances played by the program on air, **transferring** of old data; **check** for unnecessary files (check for unregistered sound files in the directories of the active devices - in case of findings a list is displayed and the user can chose whether he wants to delete or move the files; deletion of old play lists from the global data base; **test** of the sound files for availability and validity - should a sound file is not found or it has a damaged structure it is marked as being damaged and the local data of the computer on air is automatically updated; **overview** and deletion of error messages, generated by the program on air.

4.4 "Advertisements" module

This module serves for describing the broadcasting schemes of ad spots and the advertisements of the programs of the reference radio. (announcements). The

registration of new ad spots is implemented interactively - the sound file of the advertisement is chosen, the ordering firms is entered from the catalogue of clients, as well as the person in charge of the advertisement and the text to it, if any.

The ad manager can check the number of emissions according to the reference scheme and the occupied on-air time, and depending on the active dialog page with the tabular data at the moment of displaying, it is possible to generate the schedule of distribution by time of number of performances.

4.5 "On air" module

This module serves for playing of sound files in real time. It collects the data from all remaining modules. The screen reveals all the data necessary to the host (current play list).

At initial start of the program the active page is that which contains the performances of the current group. The list is formed in three columns - performance name, singer's name, duration. It is possible to sort the performances by name or by singer. One group may have performances of different types.

The news page contains a list of the news emissions and a text window for the news text. If the chosen emission is changed its text is retrieved. An overview of the news only from the current date can be made.

5. Conclusion

The presented system enables to facilitate and automate the operation of different groups during the preparation of the broadcasting

Anticipation: development of a module for automatic generating of musical playlists in accordance with rules and templates, pre-set by the music editor; designing and development of accounting module to the module of the advertisement manager. The main functions of this module will be the monitoring of the income from the ad spots and displaying of income from different time

zones. Therefore it is possible to improve the price policy.

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