

If we take the other basis vectors, such as $e_1 = \frac{1}{2\sqrt{3}}(1, 1, 1, 3)^T$, $e_2 = \frac{1}{\sqrt{2}}(0, 1, -1, 0)^T$,
 $e_3 = \frac{1}{\sqrt{6}}(2, -1, -1, 0)^T$, $e_4 = \frac{1}{2}(-1, -1, -1, 1)^T$ and $f_1 = \frac{1}{\sqrt{3}}(1, 1, 1)^T$, $f_2 = \left(0, \frac{1}{\sqrt{2}}, -\frac{1}{\sqrt{6}}\right)^T$,
 $f_3 = \frac{1}{\sqrt{6}}(2, -1, -1)^T$, the singular decomposition of the matrix A is of the form:

$$A = Q\Sigma P^* = \begin{pmatrix} \frac{1}{\sqrt{3}} & 0 & \frac{2}{\sqrt{6}} \\ \frac{1}{\sqrt{3}} & \frac{1}{\sqrt{2}} & -\frac{1}{\sqrt{6}} \\ \frac{1}{\sqrt{3}} & -\frac{1}{\sqrt{6}} & -\frac{1}{\sqrt{6}} \end{pmatrix} \cdot \begin{pmatrix} 2 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix} \cdot \begin{pmatrix} \frac{1}{2\sqrt{3}} & \frac{1}{2\sqrt{3}} & \frac{1}{2\sqrt{3}} & \frac{3}{2\sqrt{3}} \\ 0 & \frac{1}{\sqrt{2}} & -\frac{1}{\sqrt{2}} & 0 \\ \frac{2}{\sqrt{6}} & -\frac{1}{\sqrt{6}} & -\frac{1}{\sqrt{6}} & 0 \\ -\frac{1}{2} & -\frac{1}{2} & -\frac{1}{2} & \frac{1}{2} \end{pmatrix}$$

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THE FRONT-END DESIGN OF CINEMA POSTER CONTROL SYSTEM OF THE REPUBLIC OF BELARUS

VICTOR DEMENTIEV, MARIA DEKANOVA
Polotsk State University, Belarus

The subject of development is cinema poster control system of the Republic of Belarus. The purpose of the work is creating a system for convenient management of cinema poster of the Republic of Belarus. In the article issues connected with a process of control system front-end design are considered.

The purpose of control system front-end development is to provide convenience for administrator's work with data base records and excluding possible errors in data base work. Thus, a particular thought should be given to graphical user interface development.

Generally most control systems contain several weak points. As a rule most CMS are developed to meet the common needs (articles adding, users moderating, etc.). That's why developers experience certain problems while different specific and unique modules adding to these CMS [4]. As a result the entire system becomes more bulky. Some opportunities of system aren't used because they are not needed for current demands of the user, but they require some certain amount of resources. Besides the style of common CMS is not up to date enough. Now Google tends to use the so called Material Design [3], which is similar to minimalism. This style is used in the development of control systems. This design language gets more and more popular nowadays and looks neat and accurate. There is no need in colourful pictures which may confuse the user, lose some important information or even not perceive it. The entire panel of administrator of the system should be implemented in a unified easy on the eye style. It should also be noticed that a lot of systems do not provide users with convenient work. For major business process tasks execution user has to carry out different not obvious steps in these systems. The current system should be absolutely clear and pellucid. It is necessary to provide the ability of any cinema administrator to perform easily any action by clicking no more than two buttons. Special attention should be paid to ergonomics. Convenient location of elements allows to make the work easier and to decrease cognitive pressure.

As a development environment JetBrais PhpStorm 8 has been chosen. This integrated development environment has a perfect user interface and supports the latest versions of PHP. Besides, the PhpStorm gives perfect opportunities for comfortable development in different programming languages such as JavaScript, HTML и CSS [2].

The Skeleton library was taken as a foundation of CSS stylistics for building system [1]. This library gives minimal opportunities for starting a personal project development. That is why all major styles are created autographic.

Font Awesome library is used for display of icons [1]. It contains vector icons, which are integrated to font. Their advantage is that they are able to change size without loss of quality. To say more different CSS styles may be applied to them, for example, changing of colour.

JQuery library is used for convenient work with JavaScript [2]. It gives an easy access to DOM elements of page. The most of POST/GET queries are processed using AJAX technology [2]. So, it decreases time of waiting for getting response, because only necessary data will load to a page. Other data will not be updated.

All pages are marked up by single template: header – main contents – footer.

Before starting work with the control system, you have to pass the procedure of authentication. It's performed using the form for authorization. The form for authorization consists of two fields for filling of e-mail and a password. Also, it has 'Log in' button.

Pages, which access to global administrator are described below.

The menu is placed in header of the site. It contains the following items:

- statistics;
- management;
- changes log;
- log out.

The item «Management» is a drop-down list which may be opened. The drop-down contains the next sub-items:

- cinema management;
- users management;
- film formats management;
- cities list management.

A count of entities in the system, statistics by cinemas and other information are placed on the 'Statistics' page.

The list of changes is placed on the 'Changes log' page. It's a list with changes. Administrators of cinemas apply them in their cinemas. The global administrator can see all the changes and take action if administrators of cinemas violate the rules.

The page for management of cinemas and the page for management of users are alike. The example of this page can be found on Figure 1.

Управление кинотеатрами
Главная панель управления
Пользователь: victor_dementiev@mail.ru

Статистика | Управление ... | Лог изменений | Выход

ДОБАВИТЬ

Управление кинотеатрами
Управление пользователями
Управление форматами фильмов
Управление списком городов

ID	Город	Админы	Действия
65	Октябрь Барановичи	0 из 1	
66	Октябрь Борисов	0 из 1	
27	Мир Брест	0 из 1	
26	Беларусь Брест	0 из 1	

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Fig. 1. Page of cinema management

These pages contain entities list, some information about it and available actions for it. The administrator can add new cinema to the system, edit or remove it using this page. Also, he can log in to any cinema as an administrator of cinema and do any actions which are available to him. Administrator may create new administrators, edit or remove them on the 'Users management' page. And he can add users to blacklist.

The page for management of film formats and page for management of cities list are also alike. They contain list of entities. Administrator may edit or remove them. And these pages contain additional field for quick adding of a new entity. All actions use AJAX technology [2].

As the administrator of cinema has different functions from those of the global administrator, he has other items in the head menu:

- poster;
- add;
- archive;
- to control system;
- settings;
- log out.

ITC, Electronics, Programming

And item 'Add' is drop-down list and includes the following sub-items:

- add film;
- add sessions;
- add cost.

The list of current films in the cinema, its sessions and available actions are placed on the 'Poster' page. Administrator may hide any film from end user on this page, he may go to editing of a film or remove it. A film is moved to archive after deletion. All deleted films are available on 'Archive' page. The administrator can delete film from system completely only on this page.

The 'To control system' item of menu is displayed only if the global administrator has logged into cinema within 'Cinema management' page. This item sends back the administrator to the list of cinemas. The 'To control system' item is not available for the administrator of cinema.

The administrator may change information of cinema on the 'Settings' page, for example phone, address, description. The administrator can also change the password on this page.

Pages for adding and editing films are very much alike and contain the same fields. The administrator may upload poster and select format of film on these pages. Besides, standard data for film are filled on these pages – title, country, year, description, etc.

The list of added costs in the cinema and form for adding new cost are placed on the 'Add cost' page. The costs may consist of several blocks. So one record can contain up to 10 costs. And if cinema has hall with sectors with different costs, the administrator may use only one record for adding costs for all the hall. The administrator may also remove or edit record, or create clone of record with costs there.

There are dropdown lists of available movies and prices on the page of sessions adding. They have to be selected to add a session to the system. At the same place a user has to set a period and time of the session.

Besides described menu items, at the foot of each page the following items are available:

- help;
- system rules;
- provided feedback.

On the help page the list of possible issues is placed. Ways of problem solutions are also placed there. The explanations of actions are video-represented. The user may also find examples of all available to the administrator functions. The page of rules contains the list of rules for working with a system. In case the administrator does not follow them, he may be sent to a 'blacklist' and be banned. After the 'Provide feedback' link clicking the pop up window will be shown to the user with a form of creation of a message to the system administrator.

The appearance of a page 'Poster' is shown on the Figure 2.

Текущая афиша
Кинотеатр: "Октябрь"
Пользователь: victor_dementiev@mail.ru

#	Фильм	Сеансы	Действия
3	 НЕОБЫКНОВЕННОЕ ПУТЕШЕСТВИЕ СЕРАФИМЫ 2D / 48 / 6+ Начало проката: 29 сентября - 29 сентября Конец проката: 11:30	30 сентября - 30 сентября 11:30	
4	 ПЕРЕВОЗЧИК: НАСЛЕДИЕ 2D / 51 / 16+ Начало проката: 29 сентября - 29 сентября Конец проката: 17:00	30 сентября - 30 сентября 17:00	

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Fig. 2. Page of poster management

Therefore, the control system front-end has been designed for cinemas of the Republic of Belarus. This system will allow to make the process of poster management easier and faster. The graphical user interface is designed. This interface is clear to any common user without any learning of working with a system. There is a very detailed help page. It contains step descriptions for all user cases in the system. In case of wrong actions a user will be notified with an error message. In case of successful action completion a user will receive a message that the operation is successfully completed.

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THE SYSTEM PERFORMANCE ANALYSIS TO COMBAT SOFTWARE ABNORMAL ACTIVITY

ALIAKSEI RAMASHKA, KANSTANTSIN RAKHANAU
Polotsk State University, Belarus

This article defines the functional structure of the system to combat the abnormal activity of software, proving the performance analysis.

Recently, with the growth of information technology in economy and industry, and the appearance of information, presenting a certain value, whether it is a certain production technology or a customer's data, the problem of information protection has become acute.

Thus, information should be protected from unauthorized access and leakage. In terms of information technology, the computer equipment, primarily computer workstation, company employees pose a particular threat. [3]. One of the ways to gain unauthorized access to information is the introduction of the software with not declared possibilities that generate anomalous activity software.

The Functional Structure of the System

The automated system should be a software system to detect abnormal activity of software, as well as eliminate the possibility of changing information and unauthorized access to it.

Abnormal activity detection system must meet the following requirements:

- To analyze the running of the test process (application);
- The ability to analyze the signature of the executable file of the test process;
- The ability to analyze network connections opened by the process;
- The ability to analyze network traffic generated by the application;
- Implementation of the decision-making by the operator or automatically;
- To meet the requirements of fault tolerance (the failure of the system components, malicious attacks on the system resources);
- To save high performance during peak loads;
- Load balancing between multiple modules threat detection;
- Low load power and hardware resources of the computer;
- Support for cloud computing.

Based on the above-cited requirements, the system comprises the following components:

- The subsystem of information on network activity of the application;
- The subsystem intercept network packets;
- Subsystem integrity monitoring system;
- Subsystem threat detection;
- Subsystem automatic response;
- Subsystem load balancing;
- Remote Control Subsystem;
- Administration subsystem;
- The authorization subsystem.