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THE STRUCTURE OF WEB-ORIENTED CAD SYSTEM FOR MICROELECTRONIC DEVICES OF DESIGNING

The paper considers an approach to developing a framework WebCAD using Web technology to visualize the results of the system design MED (micro electronic devices) design.

Key words: Web-application, WEbCAD, Web-oriented architecture of CAD software, client-server architecture, .NET Framework CLR, the architecture of ASP.NET, Microelectronic device-MED.

Розглянуто підхід до створення структури WebCAD з використанням Web технології для візуалізації результатів роботи системи конструкторського проектування МЕП.

Ключові слова: Web-застосування, архітектура Web-орієнтованою САПР, архітектура клієнт-сервер, архітектура ASP.NET.

Introduction

At the present stage of Internet technologies, the development of a new generation of platform-independent distributed CAD microelectronic device as Web - applications is urgent. In this approach, separate subsystems of software *are* prepared in the form of Web-applications and distributed among the Web-servers and client workstations. Globally system architecture consists of three parts: the client's application, server applications, and databases. Unlike classical client-server architecture application server acts as a hub, what reduces the intensity of interaction between clients and the server database Fig. 1.

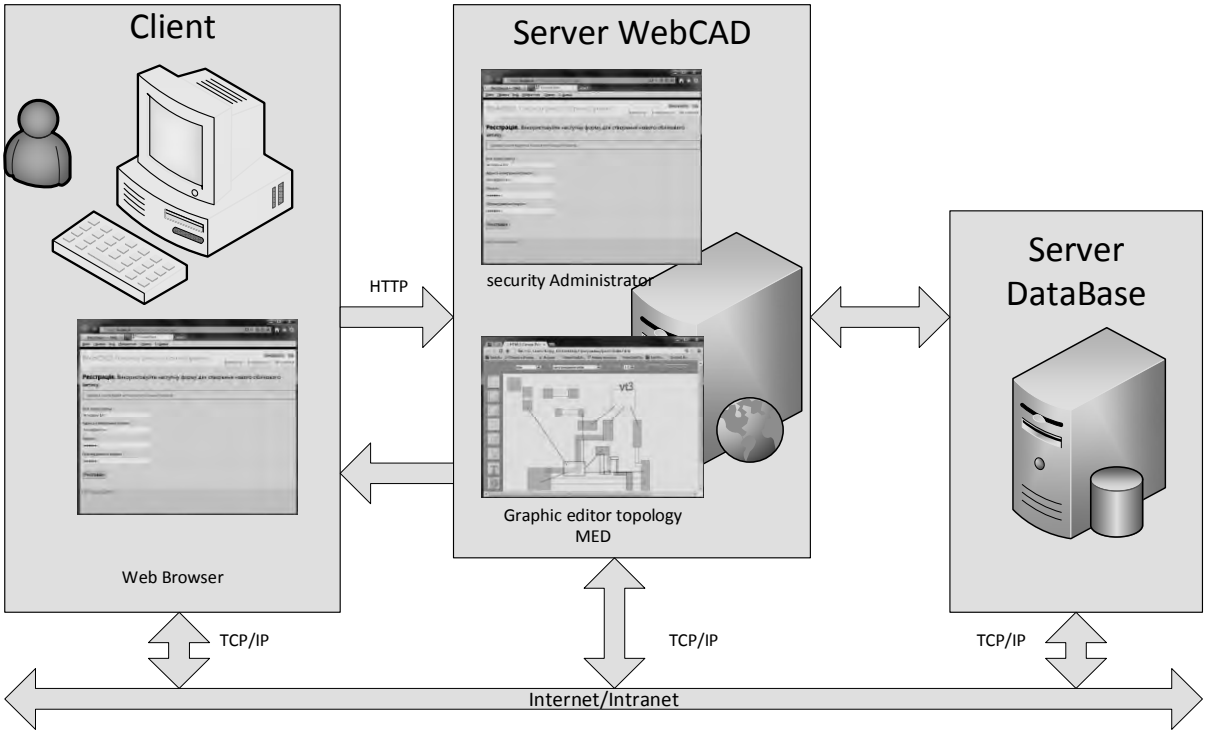

Fig. 1. Scheme of interaction client development MED WebCAD the server and database server[8]

I. Developing of Web-oriented CAD MED actuality

Infrastructure of modern industrial enterprises high prices developing electronic equipment is impossible without the use of corporate networks and Internet Fig. 2. [1]. From other side, the current system of local use of instrumentation systems at each workplace is rather expensive for the company, and requires considerable takes on the purchase of a large number of licenses and time costs of installing and configuring the software. In connection with this, the development of CAD applications that use Web technology is actual. In addition, a large number of modern enterprises working with multiple branches can be located *in* different continents. Therefore there is a need of "virtual departments" that have to be geographically distributed. The existing engineering CAD MED have significant value in a limited number

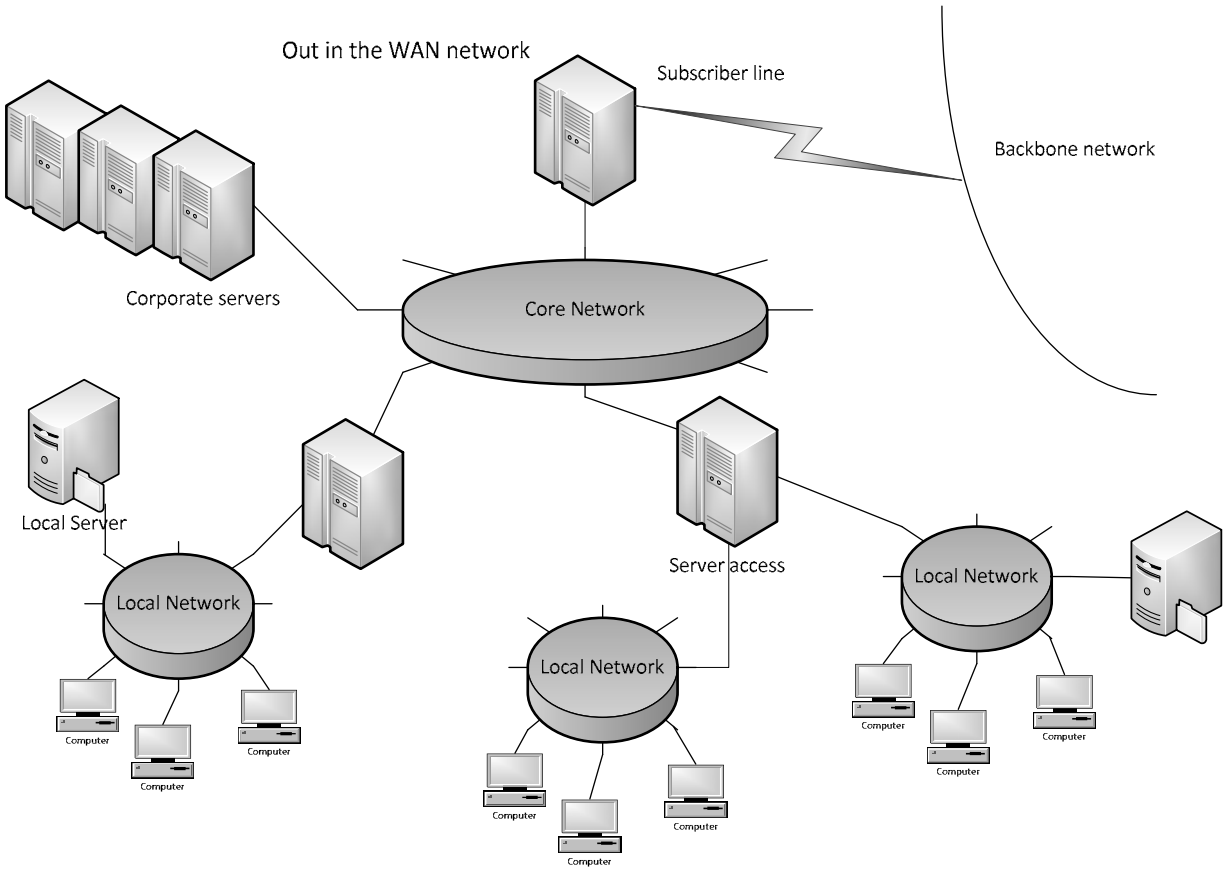

Fig. 2. The structure of corporate network CAD [1].
(http://www.intuit.ru/department/hardware/resp/5/)

of licenses for the network. Web Application Browser CAD has its limitations, but its advantages usually are justified because:

• No need to install the application;

• Updating and distributing applications - fast and automated process;

• Versions are automatically innovated;

• Users can use the application on any computer with an Internet connection, and usually it is of no significance what operating system installed;

• When working web application user's computer is much less prone viral infection than running exe-files.

So the creation of Web-oriented CAD system is important and allows remote computers to form the design and the construction process directly on Web-servers. In connection with the use of the Internet there is a need *to* develop the security system of its own. This system is based on the server level applications and cannot *depend* on the type of database and security mechanisms. The security system implemented, allows restricting access to the business server, as well as to different parts of the project. Development is designed for use in geographically dispersed employees Fig. 3.

a *b*

Fig. 3. Registration (a) and login (b) in the system WebCAD topological design MED

Security Administrator provides the possibility to manage security of the WebCAD system with the help of a Web-browser and also to: create, delete users, create and delete role design topology, change access rights of users when using the system.

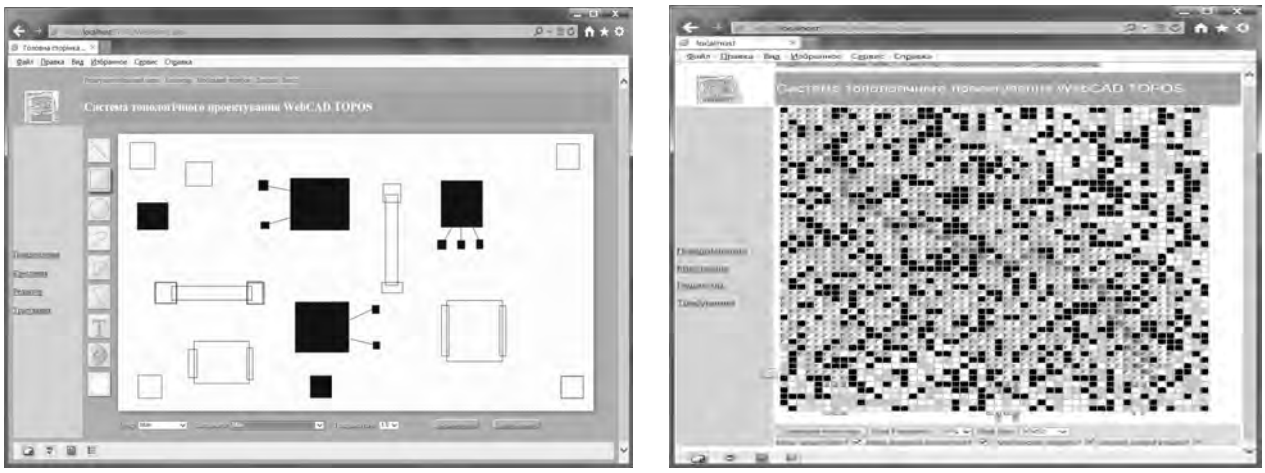

Fig. 4. Editor topology WebCAD

The use of Web-browser allows the topology editor to view projects, edit the topology elements of different level primitive's topology. Built and expanded users procedures provide the possibility to perform computational and other actions on the elements of the topology Fig. 4.

II. Using of Architecture ASP.NET

Study and analysis of existing architectures buil on Web-applications leads to conclusion: distributed architectures are better to be developed *by* using technology ASP.NET for CAD designing.

ASP.NET allows the developing Web and Windows applications using very similar technological chains, the same programming language, data access technologies and others. Programming ASP gives developers access to the application programming interface for the Internet Information Server scripts VBScript i Jscript. ASP architecture shown in Fig. 5.

ASP files are scripts that are interpreted as they become available queries. ISAPI-extension in IIS ASP.DLL associated with the file extensions .asp or .asa.

The order of processing these files *is following*:

• ASP.DLL scans files with specified extensions for the presence of tags mean an embedded code to execute on the server and transmits the code found in the Windows Script Host (WSH).

• WSH executes the code and returns the file ASP.DLL.

• ASP.DLL IIS sends this result and the contents of the file itself ASP.
• IIS returns a response to the client, *who* requested it.

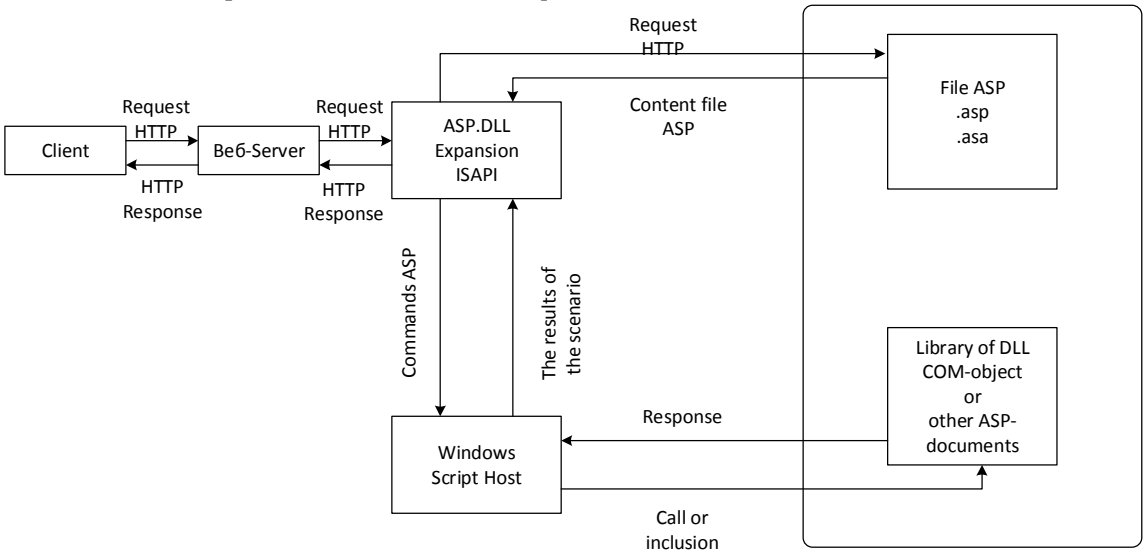

Fig. 5. Architecture ASP

Moreover, the basic programming languages by means of which the development of Web applications is possible today are fully object-oriented. That makes the development of the performing part of the program as well as its modification, maintenance, installation much easier occupation than in *another* technologies [2].

The architecture of CAD design engineering (Fig. 6.) includes separate subsystems that are written in object-oriented programming language that make it possible to use powerful tools to work with different data structures.

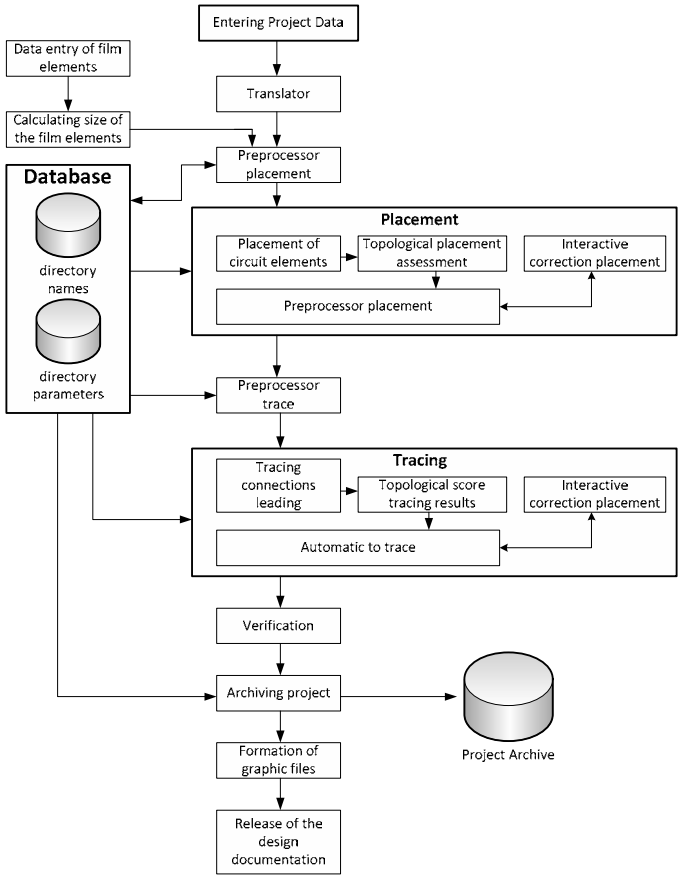

Fig. 6. Architecture CAD design engineering

Now the development and adaptation of special Internet-oriented versions of manual CAD is actual, what will allow to automatisate designing objects process of different physical nature in the scale of the enterprise.

III. Representation of the architecture of Web-oriented CAD

Let us consider the architecture of the Internet version of similar CAD on example of CAD system of design engineering GIS.

The basis of TOPOS is represented by tracing and distribution subsystems.

The TOPOS CAD includs the following subsystems:

- Calculating the size of tape elements;
- Integrated management subsystem and placing components graphics editor;
- Integrated Management subsystem, and trace components graphical editor;
- The subsystem verification.

The data to be transfered between subsystems need the use of the text file with description of the relationships between elements.

For adaptation of the running system TOPOS in the Internet it's necessary to develop new distributed architecture CAD with the appointment of functions between client and server. Preliminary data processing and implementation should be executed on a client-side.

Architecture of Web-oriented CAD design engineering shown in Fig. 7.

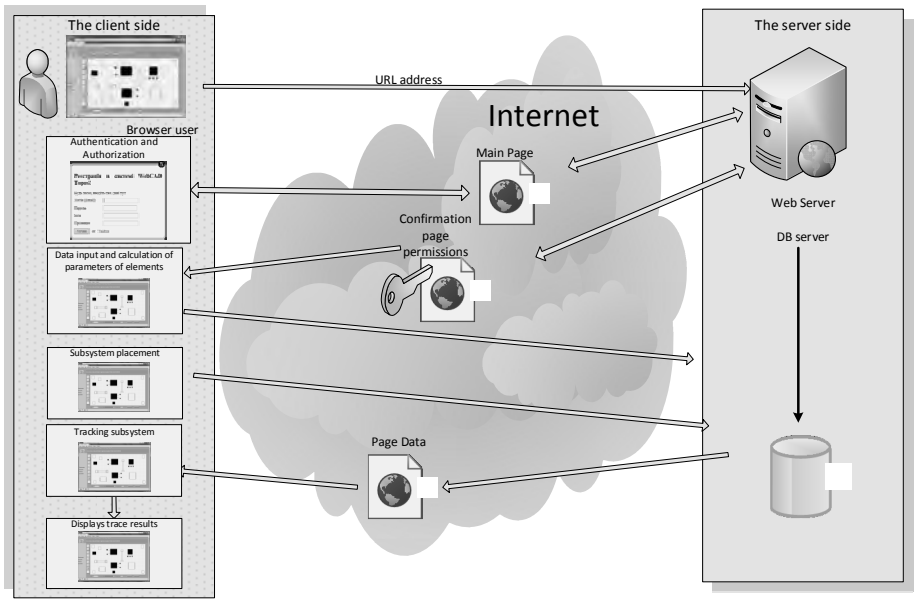

Fig.7. Architecture of Web-oriented CAD

Conclusion

This paper discusses the structure of Web-based CAD software, for example CAD design MED design.

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