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MODERN METHODS OF ASSESSING THE EFFECTIVENESS OF INFORMATION TECHNOLOGIES IN THE DEVELOPMENT OF EDUCATION

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ABSTRACT: - It is not an exaggeration to say that there is no national economy and economic network that has not been penetrated by modern information technologies. Modern information and computer technologies are rapidly entering the educational process. This article is devoted to the analysis of modern methods of evaluating the effectiveness of information technologies in the development of education.

KEYWORDS: Information technologies, modern methods, competence, efficiency.

INTRODUCTION

Electronic business is an important, rapidly developing area of the economy, characterized by constant improvement in the process of organizing electronic commerce, service and information support for customers. The reason for this is competition with the traditional sector of the economy and business entities in the information environment among themselves, which forces them to look for new ways to improve the efficiency of their activities [1]. One of the directions of this process is the development of three-dimensional models for the presentation of inventory items sold

electronically. The presentation of a product in conventional electronic stores does not go beyond its textual description or photograph. Interactive 3D technologies offer the user the opportunity to view products in real time from different angles, explore their functionality and thereby increase the chances of their sale and purchase. This interactivity gives consumers a better understanding of what they are buying and thus reduces the frequency of returning products that do not meet the buyer's expectations.

Another promising aspect of using 3D graphics on the Internet is the creation of a virtual educational environment. In distance learning - from the development of visual interactive textbooks to the creation of virtual laboratories. In many cases, a visual demonstration is more effective than a detailed description (the most striking example is the study of the structure of complex devices). The creation of virtual laboratories allows students and teachers located many kilometers from each other to come together to conduct experiments, tests or exams.

Data visualization - SD-modeling allows you to evaluate the results of many projects long before their actual implementation - to see the designed interiors, appliances, models of chemical compounds. On the other hand, it can be used to recreate what has not survived to this day - for example, destroyed architectural monuments.

Until recently, the spread of 3D on the Internet was hampered by insufficient data transfer rates. Now the situation has changed dramatically. There are new technologies that can increase the throughput of telecommunication lines several times [2].

Modern achievements in the computer and telecommunications industry, as well as new data visualization software tools, have formed important prerequisites for the emergence of three-dimensional worlds and objects in the global network space.

Internet developers need a tool that makes it as easy as possible to use 3D objects created with commonly available modeling software on the Internet.

In addition, the use of 3D visualization makes the actual problem of designing a file format that would provide the fastest possible loading of 3D models and their animation.

The degree of scientific development of the problem.

The theoretical foundations of e-commerce and Internet marketing were considered in the works of Balabanov I.T., Bragina JI.A.,

Danko T.P., Dyakonova L.P., Zavyalova N.B., Kitova O.V., Kozie D., Satinova O.V., Skorobogatykh I.I., Smirnova S.N., Kholmogorova V., Yurasova A.V. and a number of other authors.

The works of Adams J., Bezier P., Bolshakov V., Evchenko A., Nikulin E., Rogers D., Radgett D., and others are devoted to the issues of computer modeling and visualization.

With the advent of the Internet, attempts to make it three-dimensional are made quite regularly, a number of systems have appeared that provide the ability to view three-dimensional objects on Internet pages. These developments were considered in the works of O.D. Avraamova, D. Brutsman, S. Dredge, L. Jloy, D. Radgett, A. Walsh and other specialists.

The most widely known technologies are VRML, Metastream and Cult3D.

At the same time, despite a significant amount of work devoted to the development of innovative computer graphics technologies and their use in e-commerce and marketing, the market for Internet-based 3D visualization technologies is still in its infancy. Existing solutions do not provide the required level of interactivity and require the transfer of a large amount of data, which leads to a significant increase in the waiting period for downloading Internet pages from the server of the electronic store to the browser (program for working on the global network) of the visitor. As a result, some potential buyers may simply abandon the idea of visiting this network resource. The only available way to reduce the waiting time is to reduce the visual quality of the models, which is also unacceptable. The user is also deprived of the opportunity to flexibly adjust the quality level of models he needs, depending on the capabilities of his computer. Creation of complex dynamic scenes is laborious and possible only with the involvement of highly qualified specialists.

The need to solve these problems predetermined the goals and objectives of this study.

The aim of the work is to develop tools for publishing photorealistic three-dimensional objects and scenes on the Internet that have the possibility of interactive interaction with the user, as a way to increase the effectiveness of electronic marketing.

To achieve the above goal, the following tasks were formulated and solved:

based on an analysis of the current state of e-commerce and the Internet technologies market, to identify the reasons that prevent the massive use of three-dimensional visualization on the Internet, as well as to determine ways to overcome them;

develop a model of user interaction with the visual part of the electronic store;

develop software for placement and visualization of three-dimensional scenes on the Internet;

develop a new file format for storing 3D models using various compression and storage algorithms to minimize the amount of data transmitted over the network;

develop an instrumental software module for using models created by standard 3D modeling tools.

The object of research are file formats for interactive visualization of three-dimensional models.

The subject of the research is technologies and methods of formation, storage, transmission and display of three-dimensional data on the Internet.

The methodological and theoretical basis of the dissertation work was the research of Russian and foreign scientists in the field of e-commerce, the theory of computer graphics, analytical geometry.

The work used general scientific methods and research techniques: a systematic approach, comparative analysis, synthesis, classification and structuring.

The information base of the study was made up of data from Russian and foreign companies engaged in e-commerce, Internet-cera data and the results of expert research.

The scientific novelty of the dissertation research is the development of an interactive technology for visualizing three-dimensional objects for the Internet, which includes the creation of a new format for storing three-dimensional images based on procedural geometry and the use of bicubic Bezier

surfaces, methods for exporting and storing data in this format.

This new technology is designed to interact with the buyer via the Internet in real time, taking into account the technical capabilities of his computer, which allows you to expand the audience of customers, provide them with more detailed information about products and reduce the likelihood of returning goods sold electronically.

The new file format provides opportunities for speeding up information flows by significantly reducing the amount of information needed for transmission. At the same time, the waiting time for loading showcases of electronic stores is reduced without the need to increase the bandwidth of communication channels.

The most significant results of the study, obtained personally by the author and put forward for defense:

An innovative technology for visualizing goods in electronic stores based on bicubic surfaces has been developed.

A new file format has been developed for storing and distributing 3D models on the Internet.

A technology has been developed for converting models created by standard 3D modeling tools into a new format.

Software tools for organizing interactive interaction of a three-dimensional image with a user have been developed.

The theoretical significance of the study lies in the development of the methodology and methods of computer visualization that help to increase the efficiency of the use of three-dimensional models in e-commerce under the restrictions caused by the peculiarities of the Internet.

The practical significance of the study lies in the fact that the use of its results will significantly expand the scope of modern computer graphics in electronic commerce, Internet marketing and distance education.

There are many applications for 3D graphics for online consumer goods businesses. If you create an Internet store in the form of three-dimensional trading floors filled with 3D models of the goods sold, then this will give it an original and memorable look. It will be easy and pleasant for buyers of such a store to navigate in the offered assortment.

For real estate firms, 3D product presentation is a good way to increase sales. The buyer will be able to go around the house from all sides, look into any room or utility room without leaving his computer.

Office and industrial equipment require constant care, replacement of consumables, prevention and repair. This should be done by specialists who still need to be trained first. In this case, the manufacturer can be offered to organize distance learning via the Internet or another computer network. To do this, SP-images of a given technique are created, available for study from all sides and from the inside.

With the help of 3D design, it is easy to increase the attractiveness of any resource on the Internet, whether it is a corporate website or a virtual art gallery. Three-dimensional navigation will facilitate and speed up the search for information. Text materials will appear only at the final stage of the search.

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