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Appling the Concepts of Panorama in Virtual Reality Using the Map Principle on a Library Website

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Abstract:- An Image associated with a hyperlink leads to a one hypermedia exception of one image that is a map; it leads to more than one link. So this principle of a map is used as an idea to form a virtual library using the concepts of the panorama so that the image of the library leads to more than a link of the books. This is a new idea in the libraries websites. The website has been applied in an environment that is using the concepts of panorama in virtual reality.

Keywords:- Panoramic Website, Virtual Reality, Virtual Library, Panoramic Library.

I. INTRODUCTION

The proliferation of Internet, specifically, the World Wide Web (WWW) has made a tremendous impact on the society in terms of what is needed, how are acting, and the habits. For example, instead of going to a physical library, now can wishing to retrieve the contents at desktops, laptops, or on mobile devices. The wish to have ubiquitous access to the Internet irrespective of whether are moving or even traveling from one part to the other part of the world. If students want to read a book, they want that the book should be readily available at the device they are using at the moment. This has led to a concept of electronic library (eLibrary), where the contents can be downloaded to the device by simply clicking the mouse or just pressing some buttons. The physical libraries in todays world cannot survive if they do not provide the contents electronically. Therefore, in addition

To housing physical books, a physical library should also possess electronic books (ebooks), videos, lecture slides, thesis, reports, journals in electronic form (ejournals), etc. The library has to be connected to the Internet so that internal users (or users from inside the institute) and external users, including those from different parts of the world, may have an access to the resources and contents of the library. In other words, a modern library has to act as a content provider, rather than traditionally providing only books, journals, reports, and thesis, all in physical form [1]. Building a digital library is expensive and resource-intensive. Before embarking on such a venture, it is important to consider some basic principles underlying the design, implementation, and maintenance of any digital library. These principles apply not only to conversion projects in which analog objects are converted to digital form, but to digital libraries in which the objects have always been in digital form ("born digitally") and to "mixed" digital libraries in which the objects may be of both types. The principles are, in some sense, self evident, yet it is easy to lose sight of them when under pressure to build a system, despite limited resources and time [2]. E-Library provides users with content specifically geared toward research in libraries. Unlike search engines, eLibrary boasts trustworthy educator-approved websites, relevant top-quality multimedia, and many features that save research time, like citation tools. With eLibrary can getting answers to the research questions, not just a list of keyword-matching results [3]. Digital library collections contain fixed permanent documents. While current libraries have more dynamic collections, a digital library facilitates quicker handling of information. Digital libraries break the physical boundaries of data. Digital libraries are as important for communications and collaboration as for information seeking activities [4].

E-Library: A library that provides access to a collection of distributed information in electronic format through pointers provided locally … or a collection of digital objects housed in the same place, virtual or physical [5]. Can making use of the physical library elements as a starting point for discussing the elements and domains of digital libraries, considering three broad classes of library elements: data, metadata, and processes. A classification scheme such as Library of Congress Classification is an example of metadata. A classification scheme does not have any physical reality itself, but its application is sometimes constrained by the physicality of the objects it classifies [6].

1.1 E-Library Website

Through the online public access, Internet facilities and multimedia terminals, information in electronic and multimedia formats has fast become an integral part of the library's resources. Remote access to library services including web renewal service, online reservation service and email enquiry service, gives the public greater convenience and faster than traditional library system [7].

1.2 Panoramic Virtual Reality

Virtual reality can be viewed as a software paradigm that offers to one or more users to explore and interact with a computer generated environment. Different types of devices allows to users to perceive and manipulate the visual objects as in the real world. The natural manner of interaction makes the participant to feel embedded in the environment. The virtual worlds are given by mathematics models and software programs [8, 9].

1.2.1 Motivation to Use Virtual Reality

Undoubtedly VR has attracted a lot of interest of people in last few years. Being a new paradigm of user interface it offers great benefits in many application areas. It provides an easy, powerful, intuitive way of human-computer interaction. The user can watch and manipulate the simulated environment in the same way he acts in the real world, without any need to learn how the complicated user interface works [10].

1.2.2 Virtual Reality (VR) System Criteria [11]

1. Interaction with the virtual environment must be intuitive.
2. Rendering must be done in real-time and without perceptible lag.
3. Object behavior must be simulated in real-time.

1.2.3 Nature of Digital Photography

The structure of a digital image consists of a very large number of picture elements called pixels, arrayed in some regular pattern. Each pixel is a set of discrete numbers consisting of bits of information representing a specific color, intensity and location in the array. The number of pixels in an image has a direct bearing on the quality of a digital image in terms of its sharpness and clarity [12].

1.2.4 Panoramic Image

Panoramic image stitching has an extensive research literature and several commercial applications. The basic geometry of the problem is well understood, and consists of estimating a 3×3 camera matrix [13]. Wide-angle and panoramic imaging have had significant impact on a variety of real-world applications. For example, being able to “see” in all directions provides situational awareness in surveillance and autonomous navigation tasks [14]. It is useful to classify panorama VR by looking at the type of image display into static panorama VR (photo-based panorama VR) and dynamic panorama VR (thereafter called Panoramic Video) [15] . The use of video cameras in place of digital cameras is possible but not without its drawbacks. The problem lies with the resolution in today's commercially available video cameras [16].

2.1.5 Static Panorama VR

With static panorama VR, the user is presented with a single still image of every direction of view. Still panorama VR is typically created by taking a set of images of a scene using a rotating camera, and by projecting these images onto a common surface. This photo-based virtual environment is low cost and effective, and is similar to computer graphics models. Photo-based Panorama VR can be made using appropriate hardware and composing software [15].

2.1.6 Environmental Maps of Panorama

An environment map is a projection of a panorama onto a simple shape. The perspective of a panoramic image is changed by software in order to present a realistic display of the panorama on a computer screen. There are three different types of environmental maps: cylindrical, spherical and cubic [16].

1. A cylindrical panorama is the most common type of a cylinder giving the feeling of standing inside a can, see figure (1.1).

Figure (1.1) Cylindrical panorama

2. Spherical panoramas are achieved through the projection onto the inside of a sphere giving the feeling of standing inside a bubble, see figure (1.2).

Figure (1.2) Spherical panorama

3. As with a spherical panorama, cubic panoramas possess the same ability in terms of panning 360° horizontally as well as 180° vertically, see figure (1.3).

Figure (1.3) Cubic panorama

The main difference lies in the projection of the panorama onto the inside of a cube rather than a sphere [16].

II. PANORAMIC LIBRARY WEBSITE

This website has been designed to help the students, the lecturers, to be able to navigate in the library, search for the required book among the shelves, and review the index of the book without the need for the actual attendance to the library.

The data gathering process includes collecting all the required information about the library of the university, writing the required needs of the library, and preparing all the necessary resources to build the website.

Panoramic image has been taken from the library in order to enable the user to navigate the library sections through the panorama that have been used in the virtual reality. This makes the user feel like he is really visiting the library.

Thereafter, each shelve has been photographed separately in order to have a clear photo for all the books that are on the shelve. The collected photos have been sewn to take a form of a real library using Adobe Photoshop.

It is known that the use of the images with their real size will slow the loading process; so that the images have been processed to be appropriate to the speed of loading. In addition, the visual quality of the photos has been chosen to be between the high quality and the medium quality so that the speed will be improved without losing the overall visual quality.

The virtual library interface must be designed to contain a panoramic image, as shown in figure (2.1).

Figure (2.1) Panoramic Image for the Library

So all the university's students and lecturers can navigate among the library shelves and search the database to find a particular book and review its index in pdf format, see figures (2.2), (2.3), (2.4), (2.5), (2.6).

Figure (2.2) Virtual Reality Library for the Law Department

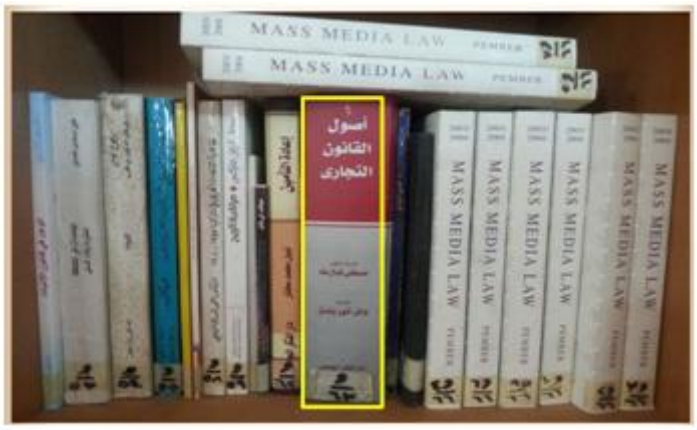

Figure (2.3) Select the second shelve

Figure (2.4) Display the index of a book

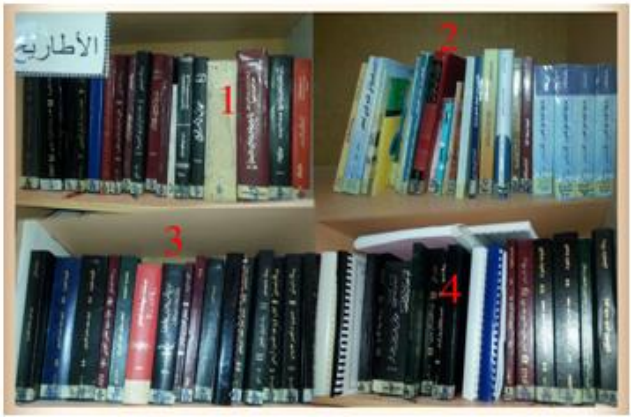

Figure (2.5) Virtual Reality Library for the Thesis

Figure (2.6) Virtual Reality Library for the Media Department

III. CONCLUSIONS

Virtual library saves time and effort required to actually visiting the central library, the combination between local and online website is to provide availability of the library website. Using the concepts of the panorama in virtual reality makes the user like to visit the library effectively. Maintain library resources from damage or loss through the electronics website.

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