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Online Customer Interactive Web3D E-Commerce Platform NARKii.com

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Abstract: Since the inception of Web 3D technology, we have seen an evolution of human interaction in virtual space. Today, we can manipulate 3D products, but we cannot see ourselves interacting with those products. Recognizing that to experience features and benefits of virtual products fully, NARKii.com technology offers potential customers the ability to see themselves wearing, rearranging, and using products in a virtual environment. This paper describes the technologies that support the creation of 3D products, and the creation of a personalized 3D "avatar" that can interact with those products. In addition, it describes a business model and methodology for developing a 3D virtual commercial website based on NARKii.com technologies. As the first worldwide 3D e-commerce platform, NARKii.com (http://www.NARKii.com) released its beta version on April 19 2009, following by a major revision in October 2009. The Page Ranking value jumps from one in Dec 1, 2009 to 5 in April 5, 2010. It has attracted over one million customers by now to the website.

Keywords: Web3D, Customer Interactive Web3D, Business Model, E-Commerce, Narkii.com.

1. Introduction

E-manufacturing is a new model of manufacturing. The individual products customization is one of main subjects in E-manufacturing. With the customers' increasing demand of product individualization and customization, the world market is in the trend to favor the small batched and customized products [1], while the large batched and monotypic products are loosing their advantages and competitive capability. Many companies are turning to a large scale customized manufacturing pattern [2]. In China, online product customization has been developed for nearly 10 years, which makes companies to possess favorable economic benefit [3]. However, from a point of customer individualization satisfaction view, the customers have not truly participated in the product design. Customers cannot browser their interested products from various viewing angles before placing an order [4]. The products' dimensions cannot be customized either [5]. The X3D defines how to integrate 3D materials transferred by the internet [6]. It concentrates on formulating an exchanging format [7] which can integrate 3D graphics and interacting multimedia, with the same expandability and standardization as HTML or XML. The X3D is a redaction to VRML97 ISO [8], and the redacting work integrates the upgrade of the newest industrial graphic hardware performance [9], and has structural improvement based on the feedback of VRML97 developing society [10].

NARKii.com is a public Web3D virtual business platform (hereinafter referred to as NARKii 3D business). It provides a platform completely different from the traditional online 3D product sites. In the NARKii website, businessmen can demonstrate their products in the 3D form to their customers who can wear clothes or manipulate the products by themselves. In addition, their customers can interactively change colors, styles, materials, features, and functions of the products according to their own personal tastes. NARKii.com is an independent public 3D business platform which enables businessmen to sell their products in interactive Web3d form. Its core value is to give businessmen and customers a fresh and novel experience, which

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is more intuitive, practical, personal, and enjoyable than the traditional online experience

2. Interactive Web3D Technology and how a Customer Creates Individual Products

NARKii.com Web3D Online Customization Center platform acts as a tool for 3D exhibition of the products. Its main function includes the background setting, 3D product show [11], product component rearrangement, and product material replacement. The platform concentrates on personalized design enabling users to participate in developing simulation of customized components, colors, and materials that are provided by online remote manufacturers, suppliers or vendors. Users can even participate in their own product designs on the web site.

Currently, the internet industry is suffering from an economic downturn. Therefore enterprises have paid more attention to E-commerce which is a means to cut the cost in marketing, sales, warehousing, and distribution. Under the B2C e-commerce marketing model, the NARKii.com 3D e-commerce platform offers traditional industries and enterprises the ability to enhance market opportunities through direct and indirect sales. The User Interface is shown in Figure.1.

Figure 1 Three Dimensional craftwork customizing interface

Until now, the technical 3D dynamic e-commerce platform has been developed to show footwear, clothing, craftwork, digital products, mechanical products, electrical and many other categories of products. The operating steps are as follows:

Step 1. Software, such as Autodesk 3ds Max or Rhinoceros, is used to build sample product. Product components are arranged in accordance with their different textures.

Step 2. Components are rendered according to the product and texture requirements of different materials.

Step 3. The sample product is displayed in a 3D web page aided by the currently popular 3D engine technology tool Narkii.com 3D middleware.

Step 4. A data connection between the 3D engine interface and web page is realized using Java programming language. Furthermore, users can click control buttons on the web page to transform the material and colors. Users can also replace backgrounds and other components.

3. Functions and Design of Online Customer Interactive Web3D E-Commerce Platform

The NARKii platform provides functions listed follows:

(1) 3D modeling and exhibition of products: the 3D graphics display of products has more attraction to customers. NARKii has established a public 3D display platform for 17 major categories and hundreds of types of products, providing many columns such as latest products, popular products, supply and demand information, industry information, corporate data and others on the home page, which can provide the enterprises brilliant 3D display [12] and advertising services of their products. On the other hand, having good merchandise with 3D display on the internet needs to do model design, texture mapping design and interactive design. These usually make more expert designers involved in the products which can be commissioned to the third party to fulfill the 3D modeling process and upload them to NARKii exhibition area for display. In doing so, it will give consumers a unique experience and serve the purpose of increasing product sales.

(2) 3D virtual shop (Supporting Online Customization): NARKii website can supply virtual shops to merchants as the customers can walk in a virtual mall and select goods freely, then they can give tryout or buy them on the Internet. From the perspective of businessmen, the key benefit is that his shop can reach any Internet terminal so that consumers fully appreciate and understand the goods and services they offer. Furthermore, customers can go to the online shop anytime and anywhere they want, keep abreast of the latest merchandise, and create and select their favorite and personalized products.

The virtual shop supports online customization, where users can assemble their own favorite products using the existing network product components such as color, texture, and style. These customized requirements are then submitted to the store, where the store will fulfill their order in accordance with their requests. Although the virtual shop cannot wholly replace the real commerce, it can play a complementary role to traditional large-scale commercial operations. For example, the traditional mall offers highly popular and abundant product categories and choices, but customers often have to travel great distances

for shopping. This is often a very tiring shopping experience. The online virtual shop serves as an effective alternative to the traditional mall shopping, and offers customers the opportunity to virtually try the products before they buy, which greatly reduce time and energy taken up by physical shopping, and truly make shopping a leisure activity. In addition, customers can assemble their own products and select preferred color and style on the 3D product display page [13].

(3) 3D Virtual Gallery: In building an actual shopping mall is a very expensive project with alarming costs, especially the ceramic stone and clothing flagship stores that need to establish many large-scale exhibition halls across the country. For example, a 100 square meters of ceramic products exhibition building can cost 1 million RMB, while the construction of 100 ones of identical stores in large and medium cities in China costs up to 1 billion RMB. On the other hand, a nationwide 3D virtual gallery [14] just takes total investment (including hardware and software) of 5 million RMB, supposing with the average 5 year equipment depreciation rate. The equipment investment per year is 1 million RMB which givess significant savings in the corporate marketing expense. What's more, a virtual gallery can directly reach consumers through new Internet channels, enhancing customer's access to the products, as more and more enterprises begin to use Internet-based virtual exhibition halls.

(4) Virtual community: a multi-user virtual community, which is to create a large virtual environment, each visitor in the virtual community can roam in the virtual world with his/her own three-dimensional avatar built through the human virtual simulation system. When a number of visitors get remote access to virtual community at the same time, they can communicate with one another with voice or text message. Virtual community can be a hall, classroom, club, exhibition square or gallery. It truly makes the virtual reality [15] come true, unfolding various activities to simulate the real counterparts in virtual community on the Internet. Anyone around the world can use the Internet to join various cultural or entertainment activities as lon as the three-dimensional virtual scene is available in their environment. In the future, virtual community will likely appear as a main application form as the web3d graphics technology in the internet is well developed. [16–20].

A system framework is shown in Figure 2. The System is based on two core technologies, one of which is 3D Middleware engine and the other is 3D Real-person Simulation System. Other steps are system architect, program development, and related 3D technology, supporting technology, marketing and management.

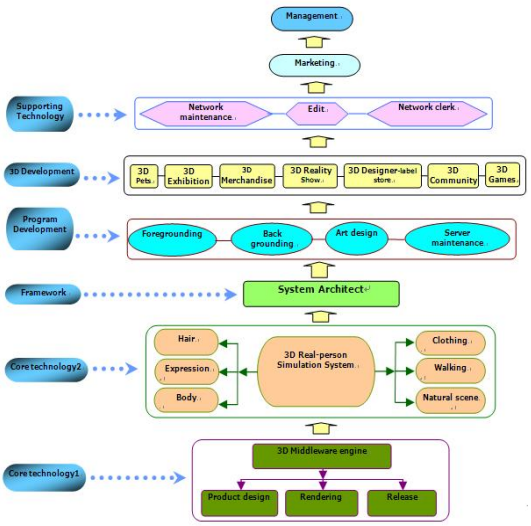

Figure 2 Web3D design diagram for interactive e-commerce system

4. The Business Model of Narkii.com Platform

Users can receive the following high-tech services through 3D business alliance:

(1) Free 3D product model exhibition: It is desirable to display all-around three-dimensional products on the Internet. By changing clothes directly and assembling the products, they want to attract customers.

(2) Free 3D products modeling: For partners joining the 3D business alliance, they get the privilege for free 3D modeling of their products from NARKii.com.

(3) Free corporate advertising embedded in 3D scene: It is a new brand of Internet media, which is intuitive, interactive and close to users. Showing corporate ads in the 3D scene or directly naming buildings with corporate title in the virtual 3D world will make the world impressed more directly, so that enterprises and users can maintain a close relationship. For the partners, they are free to display corporate images on the buildings and advertise in the NARKii 3D world.

(4) Online customization and business: An obvious deficiency of the existing e-commerce model is that it is difficult for buyers to visualize how the actual product will look like. However, products displayed on NARKii.com not only give a vivid display to customers, but also provide online customized assembly of products with their preferred color, texture, and style. Customers can then send their customized order to the company online customer service center or directly to the enterprise.

(5) Virtual trading and real return: The 3D models [21–23] created by any business or individual can be traded just for free or with virtual currency, which can be exchanged for real commodities at a certain percentage discount, with

such means enterprises can harvest new customers due to more concerning, On the other hand, users can accumulate real voucher through virtual currency [24–27]. The Business Model of NARKii.com is shown in Figure 3 and Figure 4. In Figure3, on the basis of Narkii.com platform, 3D Business Alliance and Narkii Modern City are the advanced stages as technology and platform are updated. In Figure 4, business model development is divided into three phases, i.e., early stage, midterm stage and 3D dream city.

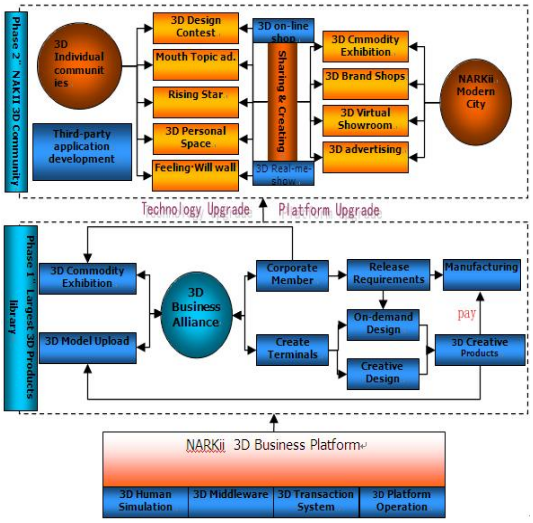

Figure 3 Transaction design at development stages of NARKii.com

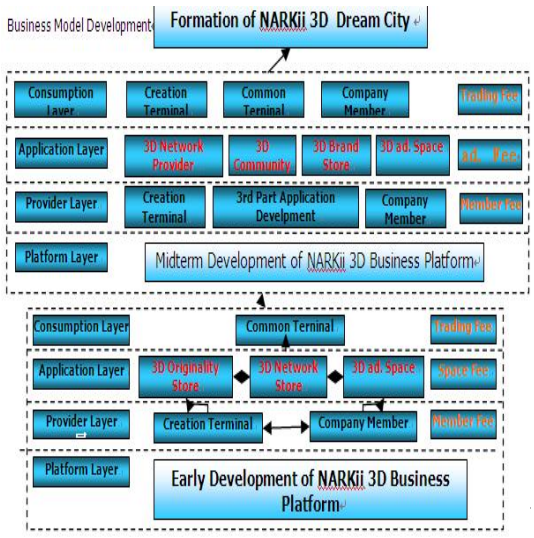

Figure 4 Business model development stages

5. Implementation and Results

As the first worldwide 3D e-commerce platform, NARKii.com (http://www.NARKii.com) released its beta version on April 19, 2009, following by a major revision in October, 2009. The PR value is just one in Dec 1, 2009 and it upgraded to 5 in April 5, 2010. There are over one million customers on the website currently. The homepage of NARKii.com is shown in Figure 5.

Figure 5 Homepage of NARKii.com

It has taken much effort in order for Narkii.com to become a market-oriented model. It is the business channel has continued to expand and attract more attention from corporate customers as members. The brand value has been substantially upgraded through massive public recognition by customers such as Google. It is expected that the Page Ranking value will reach 7 or higher in the near future.

6. Conclusion

This paper introduces a customer interactive e-business network-WWW.NARKii.com based on Web3D holographic simulation technology. Detailed description of its business model, platform framework design and business applications are also presented. The model has received positive recognition from the market after 6 months operation; however there are still many aspects to be improved. These aspects consist of (1) Web3D interactive technologies still require to be enhanced, (2) Web3D reality simulation system needs further research on voice and facial expressions capturing, and (3) System responding speed demands for improvement.

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