Method for Constructing a Stereoscopic Electronic Book System - Postprint

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Abstract

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Full Text

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This paper introduces a method for constructing a three-dimensional electronic book system. Oriented toward user and reader needs, this method helps readers quickly and effectively acquire required knowledge through rational organization and guidance of knowledge points, thereby significantly improving reading and work efficiency.

Keywords: information explosion; deep reading; data visualization; evaluation
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Reading is the most accessible means of self-improvement and an important way for humans to obtain information. With the development of the Internet in China, an increasing number of people are acquiring needed information through online reading, making e-books a primary means of information access. However, in this era of information explosion, reading attentively and acquiring knowledge is no easy task. This paper attempts to analyze current challenges and propose a method for establishing a three-dimensional electronic book system to assist reading.

The key issues that a three-dimensional book system must address include: ensuring systematic knowledge organization, ensuring that knowledge and information can be quickly retrieved, and ensuring the correctness and applicability of information. The ultimate goal of establishing a three-dimensional electronic book system is to serve users, including general readers and professional workers. General readers are defined as those who do not read for productive purposes; for them, reading primarily satisfies needs for entertainment and knowledge expansion. Conversely, professional workers are defined as those who need to deeply and comprehensively understand all aspects of their concerns, and subsequently engage in reprocessing, recreation, and reproduction. Categorizing users into different groups helps recommend appropriate reading materials for their level, ensuring they are not intimidated by obscure content or disdainful of superficial material. It is important to note that user identity is not static; therefore, in planning the electronic book system, we hope to incorporate reader identity into consideration to achieve private, personalized customization.

1.1 High Information Acquisition Costs

With the rapid development of Internet technology, the growth of various types of information far exceeds the limits of what individuals can process. The cost of acquiring useful information, particularly time costs, has reached unbearable levels at present. One serious consequence of high information acquisition costs is that readers have no opportunity for systematic reading; consequently, fragmented reading has become the most important way for most people to obtain information and knowledge. However, while acquiring knowledge through fragmented reading, people feel not fulfillment but rather anxiety, as their increased reading volume cannot keep pace with the situation. Fragmented reading cannot form a logical knowledge system and weakens independent thinking abilities.

1.2 Uneven Quality of Traditional Publications

As one of the effective carriers of deep reading, traditional publications should shoulder the important responsibility of knowledge popularization. However, traditional publications also suffer from uneven quality: (1) Common sense errors. These often appear in translated works; some seemingly trivial errors can produce subtle consequences that affect overall sales because they conflict with consumers' deep psychology. (2) Professional knowledge errors. In every industry, there are vocabulary terms that express specific meanings. Correct terminology requires relevant professional knowledge. For example, in safety-related systems, "interlocking" (联锁) expresses a series of measures designed to achieve system safety, whereas "chain" (连锁) often represents a business model—the two cannot be mixed. Selecting books that suit one's interests and direction from a vast collection is undoubtedly very difficult. Therefore, this paper proposes establishing a three-dimensional electronic book system to assist readers in deep reading and help publishing industry practitioners avoid errors.

2. Three-Dimensional Electronic Book System

2.1 For General Readers

As can be seen from the previous definitions, the main purpose of general readers' reading is entertainment and knowledge expansion. Therefore, when constructing such an electronic book system, we need to focus on whether topics are current hot issues, whether content is attractive, and whether language is interesting.

2.2 For Researchers and Other Professionals

Researchers include those conducting scientific research in universities, research institutes, and other research organizations, as well as technical personnel engaged in R&D in enterprises. For them, first, they need to understand the current state of their industry as comprehensively, quickly, and accurately as possible, including the current status, urgent problems, and attempted methods and paths. Second, they need to invent and introduce new methods to solve problems. Therefore, for researchers, we propose establishing a two-level system: The first level satisfies their need to understand the industry status. In specific implementation, we hope to organize a collection of reviews in various fields based on research databases such as CNKI, focusing on reviews written by industry leaders. Researchers can quickly achieve the goal of understanding industry status by reading these reviews. The second level needs to establish connections between reviews and the literature cited within them for individual fields, facilitating researchers' in-depth reading, understanding of details, and innovation based on this foundation.

Non-research workers typically do not undertake innovative research tasks; therefore, the most important goal for this group is to master knowledge and improve skills. For example, for book editors, the most important task is to acquire relevant knowledge and make necessary judgments based on that knowledge to ensure content accuracy. Therefore, the book system for editors should focus on reference books to ensure they can find correct information in the shortest time possible. For IT workers, particularly software engineers, the most important task is to acquire relevant knowledge and quickly improve their skills. They already possess basic knowledge and urgently need improvement in specific areas. Therefore, the book system for IT workers should adopt a classified, progressive format. For students (excluding master's and doctoral students, who can be categorized as researchers), besides acquiring knowledge itself, they also need to build a knowledge system and cultivate logical thinking abilities. Therefore, the book system for students should focus on knowledge network construction. In building knowledge networks, besides breadth, multiple comparative reference sources should be provided for each knowledge point to facilitate student comparison and reflection.

2.4 Knowledge-Point-Based Planning

In addition to using population groups as the classification standard, which constitutes the first dimension of the electronic book system—depth, satisfying users' needs for retrieval and in-depth reading in specific directions, we also need to construct a knowledge-point-centered book system to meet users' breadth needs in reading. When constructing a knowledge-point-centered book system, we recommend adopting a hierarchical structure. Based on the relevance between knowledge areas and through clustering methods, related knowledge points are categorized. This allows users to quickly enter their needed fields while reading, simultaneously see sufficient information in specific domains, and quickly trace back and expand on nodes of interest through the sequential relationships of clusters.

3. Key Measures for Three-Dimensional Electronic Books

Establishing a three-dimensional electronic book system is a very difficult and challenging task, involving key technologies such as accurate user group identification, massive information storage, and retrieval. However, with the development of artificial intelligence and big data analysis technologies, all of this has become possible [2].

3.1 User Group Identification

User group identification relies on interaction between users and the electronic book management system. We propose adopting a heuristic questioning approach where users actively select a series of keywords, and an AI system judges users' purposes and goals based on these keywords. After each judgment, users confirm whether the currently recommended information meets their needs. If not, the system updates user information through fine-tuning, ultimately selecting information suitable for user needs.

3.2 Information Visualization

User group identification is only the entry point of reading activities, proving that the recommended direction matches users' current needs. The next step is to present all relevant information in that direction in an appropriate manner, which involves massive information clustering and visualization technologies. Currently, many mature methods are available in this area [3]. With these technologies, we can provide users with an overall concept while enabling them to quickly navigate the ocean of knowledge by following a map.

4. Establishing an Evaluation System

Throughout the establishment of the electronic book system, the most critical task is to organically organize various books and knowledge. The hierarchical

and clustering approach by knowledge points mentioned earlier can solve the interconnection problem between knowledge. However, as previously mentioned, due to information explosion, there will inevitably be many related resources around each knowledge point. For example, searching for "Java Introduction" on an e-commerce website returns about 240 results, making it difficult for readers to quickly select suitable books from these results. Therefore, we hope to help users make choices by introducing an evaluation system. While most e-commerce platforms have already implemented product evaluation functions, these evaluations are typically for entire books, which is not detailed enough for readers. The proposed electronic book system hopes to obtain evaluations for specific chapters or even specific paragraphs. Through these evaluations of specific content, users can more effectively judge whether the current content meets their needs. Simultaneously, such evaluations targeting specific information can effectively enhance the validity of book review information.

Establishing a three-dimensional book system is a systematic undertaking that represents a transformation of the traditional book publishing industry, facing numerous challenges. However, by incorporating users into the publishing planning process, it ensures that published books truly meet market demands, significantly improves publication quality, enhances publishers' reputation and revenue, and achieves a virtuous cycle in publishing. Simultaneously, the three-dimensional electronic book system can assist users in selecting books suitable for their profession and interests, help users engage in systematic reading, improve nationwide reading levels and efficiency, and thereby significantly enhance overall work efficiency.

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Note: Figure translations are in progress. See original paper for figures.