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An Internet Support and Learning Environment for Senior Citizens in China

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1. Introduction

The Internet has been developing rapidly in China. Although Internet penetration rate is high among the younger generation, the percentage of use by individuals over 50 years old is less than 3.5% [1]. For comparison, in Japan the figure is 15% (aged 65 and over) (2004) and 27.7% in America (aged 65 and over) (2005). Such a digital divide is a major concern in China. Although there have been many studies on Internet support methods, most focus on support for children or working adults. Consequently, there are few reports and papers on senior Internet users, especially on support methods for them. Therefore, we consider the following research questions: (1) What anxieties and needs do senior citizens have when using or preparing to use the Internet? (2) What implementation strategies are suggested based on the findings of (1)?

One of our previous studies, the "E-namokun" project [2] in Nagoya, Japan, proved that technology and social support methods can help senior citizens use the Internet. Japan has recognized Internet anxiety and developed many Websites specifically for senior citizens and introduced a social foundation for them. But in China, such work is scarce, nor has much research effort been expended in the field. Therefore, it is important to conduct such research and find a suitable solution for senior citizens to use the Internet in China.

2. Approach

The main aim of this study is to determine Internet anxiety and the needs of senior citizens and then offer a proposal to ease anxiety and satisfy the needs to help them enjoy the Internet. Therefore, the study's approach includes: 1) a survey of Internet usage status for seniors; 2) based on the results, proposals to simplify Internet enjoyment for more seniors; 3) experiments to verify the proposal. Research objects are seniors who are either Internet beginners or who want to use Internet in the near future.

3. Survey

1. Data Collection and Analysis

The survey of the Internet usage status of senior beginners was conducted from January 15, 2006 to March 30, 2006. In the study, the survey age was restricted to persons 50 years old or more because in most areas of China, the actual retirement age is 50 (for females) and 55 (for males). Participants included 103 seniors living in Shijiazhuang city where Internet usage percentages of the local population, domain names, and Websites basically reflect average levels in China. The questionnaire included six sections and 24 questions, and most response

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choices reflected other studies. To ensure that the questionnaire speaks the user's language, a pilot survey (5 seniors) and interviews (2 seniors) were conducted before actual questionnaires were administered.

2. Results

A descriptive statistical analysis was carried out on the raw data using MS-Excel and statistical software SPSS. We focused on the analysis of two aspects of the results:

(1) Internet anxiety

We conducted a series of exploratory factor analyses using Promax rotation and found that senior citizens have three Internet anxieties of "ability," "reliability," and "acceptability." Further, we conducted a one-way ANOVA to analyze Internet anxiety factors among users for different attributes. The results show that senior citizens experience ability and reliability anxiety, especially those with poor health, those who do not visit social facilities, and Internet novices. However, most still want to increase their Internet knowledge and face its challenges.

(2) Internet needs

We surveyed Internet needs from three aspects: information, learning, and support and found that unlike younger people, senior citizens have special information, learning, and support needs. Also, they often have already encountered significant obstacles, in particular, the difficulty of finding useful sites, trouble using browser tools, unfriendly Web interface designs, and the limitations of existing support methods. The most interesting finding is that senior citizens have a positive attitude toward learning/using the Internet, even though they may have already experienced Internet anxiety and obstacles.

4. Proposal

Based on the survey findings, we decided to provide a support and learning environment that can ease their anxiety and satisfy their needs. We propose a model called the "Senior Internet Support & Learning Environment," which is composed of four parts:

1. Browser tools for seniors

The browser tool is one factor that greatly affects Internet use. Current browser designs are particularly detrimental to the ease with which older adults "consume" information from the Web. A browser tool for seniors must consider "eyesight" and "precision of movement" to simplify browsing the Internet for seniors.

2. Web navigator sites for seniors

The Internet information needs of senior citizens are different from other generations. From the survey results on information needs, seniors require information-find methods because current directory Websites are neither popular nor entirely suitable for seniors. We suggest building a Web navigator site especially for seniors. Directory structures are based on survey results of

Internet information needs. The navigator should also have a keyword search function because this is the search method used most by senior citizens. Furthermore, because most seniors would like to receive advice from others about Internet information searching, the Web navigator should also provide a free space where users can upload their favorite site links and obtain/give advice about these links.

3. IT learning sites for seniors

We aim to provide senior citizens with an easy way to understand and access learning materials such as texts and learning CDs, etc. To improve access, an online learning site is also necessary. For minimizing levels of ability and reliability anxiety, the learning content should focus on Internet foundation knowledge, popular Internet terms, search ability, security, and antivirus knowledge. It is worth considering content understandability so that seniors, whose memories and comprehension often fades with time, can easily grasp the knowledge.

4. IT community sites for seniors and supporters

The survey results showed that public service facilities positively affect Internet usage. In recent years, since such public learning centers for seniors have increased in China, real learning and support communities should be considered. Moreover, in addition to offline social communities, a Web-based senior community site must be built that can alleviate senior worries when seeking support. By providing a virtual, easily accessible space in an IT community site, seniors can ask any question while using the Internet and supporters can discuss, answer, and provide suitable solutions to share their knowledge and wisdom.

The four components are not isolated; rather, they are closely linked to one another and form a completely integrated environment. First, the design of each must follow identical guidelines: usability and accessibility for seniors to simplify their use and reduce anxiety. Design guidelines include visibility and operation improvements and consideration of cognitive factors. Next, the information must be linked among the three Websites. That is, the information generated by one site should be reused in other site. For example, if a word or phase appears in a community site, a link should be offered to an IT learning site to provide a suitable and complete explanation to ensure that seniors understand and thus can actively participate in community sites. Based on these, the environment can be viewed as useful and necessary for senior citizens in China.

5. Evaluation

To demonstrate the proposal's usability, we built a prototype of the proposed system (Figure 1) and did an experiment on June 14, 2006 in the computer room of Hebei Senior University in China. All of the senior participants were Internet beginners with only basic computer knowledge. 24 participants used the proposed system and 19 answered questionnaires (Table 1). The results showed that the proposed system effectively eased Internet anxieties and satisfied their needs and even improved learning and problem-solving abilities. Compared with IE, most participants agreed that the new browser design was user-friendly and using it they could easily browse the Internet.
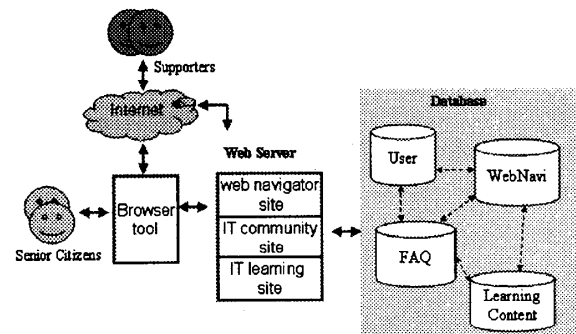

Figure 1: Structure of proposed system

Table 1 Five-stage evaluation for proposed system

Browser tool	
Are the tools easy-to-use compared with other tools?	4.21
Is it easy to browse homepages?	4.47
Is the interface design suitable for seniors?	4.47
Web navigator site	
Is it easy to use?	4.42
Is the directory suitable for seniors?	4.36
Is the interface design suitable for seniors?	4.42
IT Learning Site	
Is learning by Internet an effective method?	4.57
Is the learning content easy to understand?	4.10
Is the interface design suitable for seniors?	4.36
IT community site	
Did it help solve your problems?	4.26
Are the contents and solutions easy to understand?	4.31
Is the interface design suitable for seniors?	4.47

6. Conclusion

After determining the levels of Internet anxiety and the needs of senior citizens, this study offered a proposal based on its findings to help seniors easily enjoy the Internet. This experiment verified the usability of the proposed system. In the future, we intend to provide a better GUI and make the system more reliable based on the results of questionnaires. Furthermore, a broader implementation test is necessary.

Acknowledgement

References

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[2] Zhou, W., Yasuda, T., and Yokoi, S. (2006), E-NamoSupport: A Web-based Helpdesk Support Environment for Senior Citizens. The 2nd International Conference on Web Information Systems and Technologies, Portugal, pp. 29-36.