Design and Development of Time Self-management System for College Students

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Abstract
Based on the fourth generation of time management concept, as well as the comprehensive analysis of common time management software, the current situation of Chinese college students’ time management and the psychological characteristics of Chinese college students, this research designed and developed a time self-management system suitable for college students, trying to provide technical support for their time management, help college students improve their time management efficiency and enhance their quality of life.

Keywords—Time management; College students; System design

I. INTRODUCTION

College students are the hope of the nation and shoulder the mission of building the country. College students' time in school is precious, and its time utilization is directly related to the quality of the country's future talents. However, the current time management situation of college students is not optimistic. Zhang Xiaofang has found that 73.3 percent of college students think that there are more problems in the use of time. 51.5 percent of college students are not good at planning their daily and weekly schedules according to their actual situation. More than 1/2 college students arrange and use their leisure time according to their feelings and interests, and less than 1/5 students plan their leisure time[1]. There are many problems in college students' time management, which need to be solved urgently.

The situation of time management of college students is poor. In many cases, it is not the subjective cause of college students, but the lack of corresponding concept of time management. In the face of sudden changes in
school life, there is no guidance, no awareness of time management at the time of admission. On the one hand,
college students have heavy academic tasks and many things to accomplish. On the other hand, many college
students have poor management of time, fail to make good use of time, but do not know what to do with time. Some
students can't catch the key transaction, don't know how to arrange the order of things, in the face of seemingly
complex transaction do not know how to start. College students tend to rely on their minds to remember their plans
without the right tools, making them unsustainable. From the research at home and abroad, in the students' learning,
especially the college students' study and life, learning time management can play very important role on improving
the students' study and work efficiency. It is also help to improve the students' academic performance, alleviate
psychological pressure and reduce anxiety.

With the popularization of computer and other intelligent devices in college students, more and more
college students use electronic means to assist their study and life, and help themselves to manage their time by
computer. However, there are many problems with time management software for college students.

The goal of this study is: based on the latest time management concept, design and development for college
students' time management system, guide students to grasp the macro time, scientific planning, and promote good
habits.

II. TIME MANAGEMENT THEORY AND SUPPORT TECHNOLOGY

A. Time Management Theory

1) Time Management Concept

The concept of time management originates from the academic field, but time itself comes from life, and
time management is closely related to life, so it gradually becomes a popular concept in the process of later
development. Although the passage of time does not change the speed of its passage by any external force, it does
not mean that we are going to be a slave to time, and on the contrary, we must manage the time through a scientific
approach and conduct more transactions within a given time according to its own arrangement. The use of time
should change from passive to active, systematic, focused and planned active allocation of time. The central
principle of time management is to try to concentrate the necessary bulk time on the most important tasks.

In the literature on "time management", many scholars believe that the true connotation of time
management lies in people's self-management. Self-management is not simply the assignment of work or study tasks,
but the initiative to plan, allocate and use time according to goals, guided by system theory. In the end, in addition to
achieving the set goals, we should improve the work efficiency, explore the potential of the subject, and help the
subject achieve a sense of achievement of self-worth[2]. The ultimate goal of studying time management is not only
to manage time in an efficient way, but also to seek creative development of people and promote better
self-planning.

2) Fourth Generation Time Management

So far, the time management concept has undergone several generations of evolution. Among them, the
first three generations marked by "Memorandum", "Calendar" and "Plan Manual" respectively pursues the
management of time too much, but neglects students' psychological experience, which easily leads to the students
being in a tense state for a long time.

In contrast, the fourth generation no longer emphasizes how to arrange time and affairs, but take “important
things first” as the first principle. “Important but not urgent” affairs can achieve a balance between output and
capacity, focusing on it will help to improve the efficiency of time management and quality of life for college
students. Although the fifth generation time management concept has also emerged, its main target group are
corporate employees, which are not in the scope of this research.

“Important things first” is represented by a four-quadrant time management matrix, as shown in Table 1. In
this table, urgency means that it must be dealt with immediately. Importance is related to goals, and whatever is
valuable and conducive to the achievement of personal goals is important. The first is urgent and important and
requires immediate attention. The second type of business is important but not urgent, including networking, writing
mission statements, planning long-term goals, and nip in the bud. The third type of business is urgent but not
important, including sudden visits, some meetings, and some activities. The fourth is neither urgent nor important.
TABLE 1. FOUR-QUADRANT TIME MANAGEMENT MATRIX

<table>
<thead>
<tr>
<th>Urgent</th>
<th>Don’t urgent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Important</td>
<td>The first quadrant</td>
</tr>
<tr>
<td>● Crisis event</td>
<td></td>
</tr>
<tr>
<td>● Projects with deadlines looming</td>
<td></td>
</tr>
<tr>
<td>● Tasks to be completed within a limited time</td>
<td></td>
</tr>
<tr>
<td>● Urgent problem</td>
<td></td>
</tr>
<tr>
<td>The second quadrant</td>
<td></td>
</tr>
<tr>
<td>● The preparatory work</td>
<td></td>
</tr>
<tr>
<td>● Preventive measures</td>
<td></td>
</tr>
<tr>
<td>● To build a relationship</td>
<td></td>
</tr>
<tr>
<td>● Identify new development opportunities</td>
<td></td>
</tr>
<tr>
<td>● Make plans and take necessary leisure time</td>
<td></td>
</tr>
<tr>
<td>Unimportant</td>
<td>The third quadrant</td>
</tr>
<tr>
<td>● Some emails, some phone calls</td>
<td></td>
</tr>
<tr>
<td>● Some reports, some meetings</td>
<td></td>
</tr>
<tr>
<td>● Receiving visitors and public events</td>
<td></td>
</tr>
<tr>
<td>● A lot of immediate, urgent things</td>
<td></td>
</tr>
<tr>
<td>● Many popular activities</td>
<td></td>
</tr>
<tr>
<td>The fourth quadrant</td>
<td></td>
</tr>
<tr>
<td>● Trifles, work that kills time</td>
<td></td>
</tr>
<tr>
<td>● Some calls and emails</td>
<td></td>
</tr>
<tr>
<td>● boredom</td>
<td></td>
</tr>
<tr>
<td>● &quot;Escape&quot; behavior</td>
<td></td>
</tr>
<tr>
<td>● Watch too much TV</td>
<td></td>
</tr>
</tbody>
</table>

Generally, people are sensitive to the degree of emergency, but put off important things. Focusing on the first kind of business will lead to a larger and larger scope of processing, which will eventually lead to crisis management and occupy all the time and energy. Emergencies are usually a priority for others, but not necessarily for themselves. Highly effective people strive to reduce the number of third and fourth categories of business, whether urgent or not. Increasing the time spent on transactions in the second quadrant usually reduces the number of transactions in the first quadrant.

The emphasis of four-quadrant management is on the second class of transactions. Because the second type of business is the balance between output and capacity. As we invest more time in preparation, prevention, planning, and capacity-building, we reduce emergency time in the first quadrant. The survey found that companies with high performance and efficiency tend to spend 65-80% of their energy on the second quadrant and 15% on the third. Poorly run companies tend to do the opposite.

B. Support Technology

The main technologies involved in this study are shown in Table 2.

TABLE 2. DEVELOPMENT TECHNOLOGY LIST

<table>
<thead>
<tr>
<th>Develop Content</th>
<th>Technical Support</th>
</tr>
</thead>
<tbody>
<tr>
<td>Development Environment</td>
<td>Microsoft Visual Studio 2005</td>
</tr>
<tr>
<td>Data Storage</td>
<td>Microsoft SQL Server 2005</td>
</tr>
<tr>
<td>Interface Processing</td>
<td>Adobe Photoshop, Html, DIV, CSS</td>
</tr>
<tr>
<td>Function Development</td>
<td>Asp.Net, C#, JavaScript, Ajax</td>
</tr>
<tr>
<td>Development Architecture</td>
<td>Data access layer, business logic layer, interface presentation layer</td>
</tr>
<tr>
<td>System Framework</td>
<td>B/S mode</td>
</tr>
</tbody>
</table>

III. ANALYSIS AND DESIGN OF TIME MANAGEMENT SYSTEM FOR COLLEGE STUDENTS

A. Common software analysis

Through the analysis of the existing time management software such as “Memorandum”, “Calendar” and “Plan Manual”, we found that most of them have the following problems: they are mainly based on the first three generations time management concept, their functional orientation is not consistent with the situation of college students, and they have complex operations or unclear interfaces. Therefore, it is necessary to design a time management system which has a high level of management performance, meets the actual needs of college students and has a good operation experience.
B. Demand analysis

1) User demand analysis

A questionnaire survey on the time utilization and demand of college students was conducted, and the questionnaire effective recovery rate reached 92%. The content and results of the survey includes five aspects:

- Personal information of the respondents. Among the respondents, girls make up 86% and boys make up 14%. Undergraduates accounted for 79% and postgraduates accounted for 21%. The samples are distributed in all grades and various professions, and have certain representativeness.
- The basic situation of time use. More than 60% of the students spend most of their time on “learning”, “living” and “entertaining”, “learning” accounted for the largest proportion of them. College students usually have more discretionary time than primary and middle school students, but nearly half of them think they feel busy during that time.
- The customary way of time management. Among the respondents, 60% have a clear goal, but only 1/3 have detailed plans, only 1/3 can carry out the plan at a high level, and less than 30% are satisfied with the time management plan. This can be summarized as “more goals, less planning, less execution and poor satisfaction”. Fortunately, more than half of the students have the intention to improve their time management ability by learning.
- Compliance with the fourth generation of time management concept. 97% of the students are accustomed to taking urgency rather than importance of affairs as the preferred dimension, which does not conform to the fourth generation time management concept.
- The application of time management software. 88% of the students have never used time management software, and more than half are willing to try. Thus, the time management software for college students has a great potential for application.

2) Functional requirements analysis

The system is put forward to solve the problems of students' time and personal events, curriculum arrangement and so on. The key lies in the analysis of student time, especially the time distribution of college students. The existing software has not in-depth analysis of this, and this research as the main content. Based on the statistical analysis of the questionnaire and the fourth generation time management concept, specific functions of this system include:

- Set up a course in combination with the learning situation. The most frequently used type of affairs for college students is learning affairs. Class is an essential and important matter for students, and it is also a part of the system to be carefully designed. The system should provide the setting of the schedule, the inquiry of the schedule, and be able to distinguish the information of single and double weeks, and provide the information of teachers and classrooms in class.
- Set and handle the information of life affairs. College students' life and other affairs occupy a lot of time, and there are differences in the roles they play. It will play an important role in the time management of college students to handle daily affairs well. Therefore, for daily non-learning transactions, you should be able to provide Settings, and can query and manage. Transaction setting is a large part of daily time management. Transaction setting should have starting and ending time. When setting, it should be able to distinguish its importance from its urgency.
- Set roles and schedule tasks based on goals. According to the fourth generation of time management theory, transactions should be set according to individual roles. The system should provide life goals, term goals, etc, and determine transactions based on goals and roles.
- Set priorities and reminders for important affairs. The system needs to be able to clearly distinguish the important transactions in the learning and life affairs, mark and remind the important transactions, and promote the user to execute the plan around the important transactions.
- Provide the ability to query scheduling. The system should provide weekly scheduling queries, daily time utilization, event sequencing, etc. Weeks time can intuitive tell users this week schedule use of information and the time utilization intuitive way to tell users, today how many time is to use on the useful things, how much time can also be used.
- Supervise records of implementation results and follow up on training habits. According to the fourth generation of time management standards, transactions should have timely feedback summary. The problem of college students' bad habit of wasting time is more prominent, because it is difficult to change the bad habit formed gradually after the relaxation of the pursuit of study. Therefore, the system should be able to timely monitor and record the implementation results, and track the cultivation of habits.
- Provide software usage assistance and supports time management. Questionnaire statistical results show that the majority of students and have not used the time management software, so the application of the software
should be provided tutorial, its content is set in line with the principle of concise, the user can quickly master the software usage, and establish the use of interest.

C. System design guidelines and basic principles

The main task of college students is to master knowledge and grow up healthily. Considering that their time is flexible and variable, the system design should give full consideration to the specific situation of college students' learning, choosing, making friends and healthy life, as well as make a balanced allocation of them. Specific principles include:

- Harmony and consistency. The core aim of time management is to improve college students' effective comprehensive coordinated development, finally realizes the personal knowledge level, physical quality, psychological quality, mental outlook, the harmonious development of the communication ability and so on. In the process of system design, different time arrangements of college students in study, life, family and other aspects should be taken into account to provide various management approaches for college students.

- Balance functions. In view of the different types of time management, there should be a relatively unified form of classification, so that users can easily look at the overall situation, to balance the use of each part of the situation, and do not overemphasize the neglect of a certain type of business. In the design of the system, the steps of goal, event and feedback should be separated into separate blocks, so that the system is in accordance with the order of thinking in form.

- Surrounding center. The system design should take individual differences into account, and provide each college student with personalized central tasks, so that all their goals and plans are around their central tasks. In the system, students should be explicitly provided with life goals and term goals, and help analyze their roles and responsibilities.

- Flexible. The design of the system should reserve certain modification space. For time-sensitive and time-sensitive transactions, it should be able to adjust timely and minimize the impact on other plans. Provide recording and feedback capabilities for event execution.

D. The function module design

According to the analysis of functional requirements, the system mainly includes five major modules, as showed in Figure 1.

![The system structure](image)

Fig. 1. The system structure

The modules are as follows:

- Target Module. Function of this module is: Users input the life ideal, semester goal, role and other content, from the macro direction to grasp the university time. Provide the event name for the formulation of "target event", provide the basis for "daily event" and "learning event", and do not involve the time and information of specific event.

- Event Module. Function of this module is: The user enters information such as start, end time and repeat period of a specific event here to determine the specific time distribution of the event.

- Query and Reminder Module. Function of this module is: Visually query the five-day time schedule, provide the user with an intuitive calendar schedule, and provide a time utilization ratio.

- Executive Feedback Module. Function of this module is: Help the user to record events, habits, to the user feedback for the user to record time use of the space result of experience, objectives, plans to provide the reference for the next step for the user.

- Help Support Module. Function of this module is: Use all functions of the system for users and provide a time management tutorial for users. Users can view this part of content at any time during use.

The target module is a prerequisite for scheduling time. Users should first determine their life goals, semester goals, etc., and set their personal roles and role matters according to the mission information. Then, the target event is determined according to the role transaction guidance, and the learning event and daily event are made according to the personal role. The event information generates the time schedule and executes the plan
according to the schedule. Finally, the implementation of time arrangement is recorded, and the habit cultivation is obtained by systematic statistics. Help the support module support the overall time utilization. The relationship between each module is shown in Figure 2.

![Fig. 2. The relationship between each module](image)

E. Workflow design

After determining the functional modules of the system, the process design of the time management system for college students is carried out in accordance with the process sequence when it is used. The process is shown in Figure 3.

If you don't have an account, you need to register before you log on to the system. After logging into the system, if there is any modification to the target or event, it will enter the corresponding page operation. You can query the schedule in the system and execute it according to the schedule. After the execution of the event, the execution status and experience of the event can be filled in. The system will record and count the execution status. You can exit the system at the end of the access.

![Fig. 3. The workflow](image)
F. Database design

The database used by the time management system for college students is SQL server 2005. The database name is "db_TimeManage", and the data tables contained in the database are shown in Table 3.

<table>
<thead>
<tr>
<th>Order</th>
<th>Table Name</th>
<th>Functional Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>tb_User</td>
<td>User Table</td>
</tr>
<tr>
<td>2</td>
<td>tb_Role</td>
<td>Role Table</td>
</tr>
<tr>
<td>3</td>
<td>tb_Course</td>
<td>Course Table</td>
</tr>
<tr>
<td>4</td>
<td>tb_Task</td>
<td>Event Table</td>
</tr>
<tr>
<td>5</td>
<td>tb_Execute</td>
<td>Executive Condition Table</td>
</tr>
<tr>
<td>6</td>
<td>tb_Diary</td>
<td>User Diary Table</td>
</tr>
<tr>
<td>7</td>
<td>tb_Resource</td>
<td>System tutorial and Time tutorial</td>
</tr>
</tbody>
</table>

The data table contents of database db_TimeManage are as follows:

- **tb_User**: Used to record the user information, including login user name, password, and other related fields and life ideal, mission statement, universities, semester goals, and second and third term target term target a few fields. Where the user number is the primary key, it is also the identity column.

- **tb_Role**: It is used to record the user's role and role goals, including fields such as user sequence number, role, target 1, target 2 and target 3. A user can set up to seven role records. Where the role number is the identity column.

- **tb_Course**: Used for storing course information, including user serial number, course serial number, course start and end time, class start and end time, class name, teacher, classroom, single and double week, etc. The course number is the main key.

- **tb_Task**: Used to store events, including user sequence number, event start and end time, name, remark, repetition, habit formation, importance, emergency, etc., where event sequence number is the primary key.

- **tb_Execute**: Used to record event execution, including event date, event sequence number, execution, etc., where the execution sequence number is the primary key.

- **tb_Diary**: Used to record user diary, including user serial number, diary date time, diary title, diary content, etc., in which the diary serial number is the main key.

- **tb_Resource**: Store system tutorials and time tutorials, including resource Numbers, resource titles, resource types, resource content, and other fields, where resource Numbers are the primary key.

G. Interface presentation layer design

On the basis of functional module design, the page effect diagram after login system is designed. The interface strives to be clear, compact, harmonious and has a good interaction experience. The design effect is shown in figure 4.

![Fig. 4. Page design renderings](image)

On the main page, there are site logo bar, navigation bar, notification area, work area, footer information and
other areas. Among them, the function selection is realized by clicking the link and the drop-down menu on the navigation bar. The work area USES the iframe framework. When selecting the function, the information of other areas is retained. The content of the operation is displayed in this section, which is the main area of the page.

IV. IMPLEMENTATION OF TIME MANAGEMENT SYSTEM FOR COLLEGE STUDENTS

This chapter is on the basis of system design, using the related system development technology, to realize each function module of system, mainly including the login module, object module, the event module, query module, feedback module, help support module page. Main pages of the system are shown in Figure. 5, 6, 7 respectively.

Fig. 5. The system directory

Fig. 6. The login page

Fig. 7. The system's front page

V. SUMMARY AND PROSPECT

A. Summary

Based on the fourth generation of time management theory, this paper studies the current situation and characteristics of college students' time use, and analyzes the existing problems of existing time management software. On this basis, summarizes the time using the actual demand of college students, put forward the design scheme of the system, and use ASP.NET, ADO.NET, JavaScript and other technology to achieve the college students' time management based on the theory of the fourth generation time management system. The system is simple in operation and suitable for college students to arrange and plan their time in a scientific and reasonable way. The system can not only provide prior time setting, adjust the time plan in time, but also carry out executive
feedback and follow up afterwards.

B. Rpospect

The preliminary application shows that the system can have certain positive effects on promoting the formation of good behavior habits of college students and establishing scientific concept of time management. The research can also be expanded from the following aspects:

Firstly, the influence of social, family, personal preference and other factors are also included in the formulation and implementation of the plan. The following research can continue to go deep in the aspects of college students undefined behavior trend, personality characteristics, learning style and so on, and gain more user application feedback.

Secondly, the convenience of operation is an important factor affecting the user experience. The development of the system can introduce more graphics drag-and-drop operations, create a more harmonious interface, make the software more easily accepted by college students, and further improve the efficiency of management time.

Thirdly, this system focuses on the design and implementation of time management function. With the popularization of intelligent mobile devices in college students, the next research can be combined with the development of mobile platform.

REFERENCES
