

**IS 2924 Independent Study in Cognitive Systems**  
**Adaptive Online Course Recommendation System**  
**Part I**

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## **PROJECT OVERVIEW**

- **Course: IS 2924 Independent Study in Cognitive Systems**
- **Term: Summer 2003**
- **Advisor: Dr. Peter Brusilovsky**
- **Topic: Adaptive Online Course Recommendation System – Part I**

## **OBJECTIVE**

*To study, design, implement and document an online application with levels of adaptive functionality, which is capable of retrieving and storing information in the database through the Internet, supporting logins to access personalized information and environment, and providing further user-oriented information through a user-friendly interface.*

## **PURPOSE OF DEVELOPMENT**

- Provide people with more dynamic and complete information about courses offered in the School of Information Sciences
- Give people proper recommendations on courses to take based on their personal needs, interests and schedules as well as advisor's suggestion.
- Set up a better organized course information system in the School of Information Sciences

## **BRIEF DESCRIPTION**

The creation of this project is for an independent study practice. This project is to develop an adaptive online course recommendation system for the School of Information Sciences based on the purpose of providing proper recommendations on courses to students according to different needs and interests of each individual. The system will take suggestions from the advisor and people's feedback on each course into consideration while making recommendations.

## **EXPECTED OUTCOME**

- Web pages with adaptive features
- Oracle Database

## **SYSTEM OVERVIEW**

The adaptive application we are developing is a web-based *Adaptive Online Course Recommendation System*, which will be referenced as *CourseAgent* throughout this documentation.

The idea of *CourseAgent* is generated based on the needs of students in the School of Information Sciences and there are three types of users: *students, faculties, and staffs in IS School*. Therefore, in order to have access to the system, users are required to be a student, a professor or a staff in the School of Information Sciences. Through *CourseAgent*, people could not only get basic information about courses offered in the School but also more dynamic personalized information.

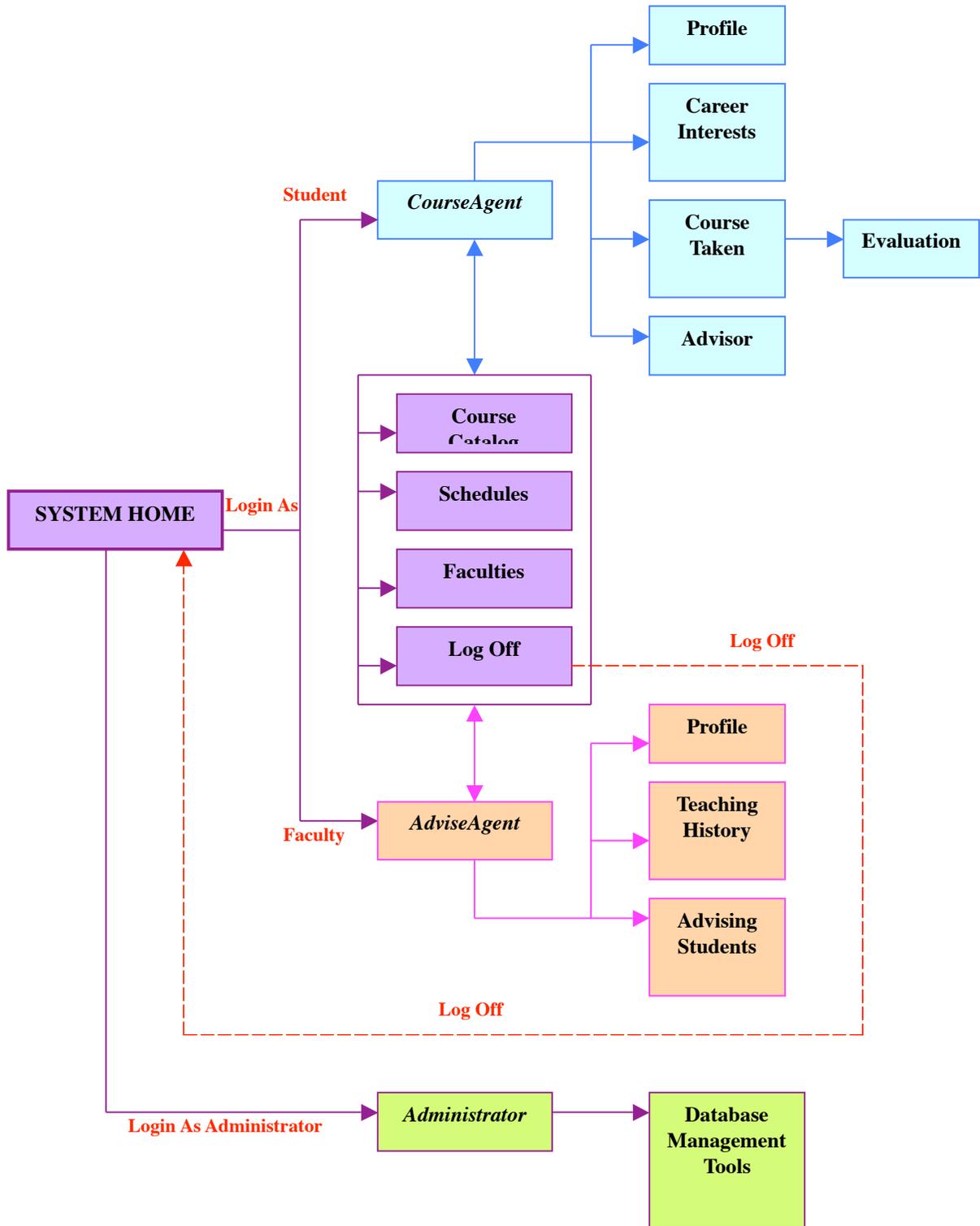
The system has two major parts, one is actual course recommendation and the other is for administration. The administration part is for school related data management and only accessed by school employees. The course recommendation is for students and faculties to interact with the system. Through the interaction, users provide their own references, their opinions about courses, and their suggestions. Based on those provided information, the adaptive functionality is then developed in *CourseAgent*.

The system is originally designed for students' benefits, and it also benefits the School in some good ways. For example, students provide their opinions and make suggestions about courses. The School will then have the best reference to improve the program to meet students' needs.

## **FEATURES**

- Interactive and adaptive web pages
- Create accounts and store user information in the database
- User login and log off
- Gather personal information, interests and needs
- Course Evaluations by students and faculties
- Analyze the collected information
- Make recommendations on courses based on the analysis of the information for each individual

# SYSTEM SCENARIO



## IMPLEMENTATION TOOLS & SKILLS

- ***Web Pages Development***

*CourseAgent* is a web-based system, so knowledge about developing and publishing web pages in the Internet is a must. HTML plus some JAVA Script is applied to develop each page in this system.

- ***Oracle Database Management***

In order to provide the adaptive functionality, there must be some basic information about each individual stored in the system. These information are basic but contains complex relations from each other, therefore, the best place to store them is in a database, not just in a flat file. Knowledge of designing a nice database to meet all the necessary constrains is crucial in this project. As a result, it took quite a bit of time to analyze the characteristic of data, construct the relationships among data, and design and modify the database structure.

- ***CGI - Perl***

All of information for this web-based system is stored in the database and then a CGI script is needed in this project for web pages to communicate with database system. Here, I choose Perl as the CGI for reasons that I would like to study and know more about Perl so that to apply it into real world. Due to my unfamiliarity with Perl, it also took me some time to get all functionalities done in the system. Nevertheless, Perl is now another handy tool for me.

- ***SQL***

Perl is the bridge between web pages and database; however, SQL is used to query needed information from the database. Based on the adaptive functionality here in *CourseAgent*, complex SQL statements are applied.

## LEVELS OF ADAPTIVE FUNCTIONALITY

- **Support system login to retrieve personalized information and navigations**, such students and faculties have different tools in the navigation.
- **Store more information**, such as career goals, course evaluation.
- **Modify provided information**
- **Generate recommended information in Schedule page showing courses taken, courses suggested by advisor, and high rating courses regards to users' career goals.**