UNIT 4   CATEGORY WISE PROBLEM DEFINITION

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4.0   INTRODUCTION

The project is dedicated to investigating the potentials of advanced technologies in group learning, information exchange and network conferencing involving teachers and students. Project development is the student's opportunity to do a significant piece of work in an area of personal interest and to expand his or her understanding of computer science. The students are free to pursue any area of computer science that is of their interest e.g., web application development or network applications etc. This unit provides a description of project problems and ideas in different areas of computer science. However, students can elaborate the project definitions further after discussions with the counsellor. You should select project problems, that is challenging, but manageable within the resources and time available.

4.1   OBJECTIVES

After going through this unit, you should be able to:

- get an opportunity to investigate a chosen topic in considerable depth;
- know how to start a project;
- understand the given project problems;
- develop or critical awareness of current problems and/or new insights, in their field of study;
- know the application and tools for project development, and
- deal with project analysis issues both systematically and creatively.

4.2   PROJECT SELECTION

The selection of project area and problem is of crucial importance. The area needs to integrate the interests of the student with the specialisation of the counsellor, and be of a suitable level of difficulty. Students are encouraged to think about the subject areas of their interest in which they would like to undertake a project, and after discussion with the counsellor, or preliminary project problem can be selected. A counsellor is formally allocated to students, and in consultation with the counsellor, a project proposal is prepared. Selecting a project problem can be difficult from the given set of projects. You could do so, by answering some of the following questions.

Am I interested in this area or topic? This is a very important question. If your answer is no, choose another area or topic. What do I know about this subject or topic?

This would determine the amount of work and research you have to put in. What are some of the things that can be discussed about this subject or topic? This identifies the amount of sub-topics (scope) that can be discussed. It also helps determine how easy or difficult this subject would be. Who will benefit from this project? It will determine the importance of your project. At who am I targeting this project? This will help you in the presentation and your answer to this question should not be "only the examiner".

The projects offered in this unit may vary substantially in breadth, depth and degree of difficulty. The most important thing is to shortlist a set of projects that are right for you. A number of students are better suited to well-defined and relatively secure projects that provide scope for representing expertise with a low risk of disappointment. Other students are better advised to undertake relatively difficult, insecure projects that require a high degree of innovative input and/or technical problem solving.

You can elaborate on project definitions after discussing it with your counsellor; so you may require different resources and references in order to understand and elaborate on the definition of these project areas. You can get detail understanding of these projects from your industrial placement employer or another similar software organisation or University (e.g., different department's, teaching, research or administration) previous projects that need further work done similar to the project description given. You should start the project with a commonly known project problem, but with a novel solution, applying a well-known solution to a novel class of problems and evaluating several possible solutions to find the best one for solving a particular problem.

4.3   PROJECT CATEGORIES

We have divided different projects into four broad areas / categories of computer science as given below, so that you can select any of these category for your Mini project.

- Application development
- Networking project
- System software
- Website development.

An initial list of project definition will be given below in the following sections however, a student can elaborate project definitions after discussing with the counsellor.

Students should select projects from the given categories according to their interest, experience and knowledge in that area, students should evaluated themselves objectively and, then choose the project. Students may propose modification and suggestions in the given project specification and finalise it with the approval of the counsellor.

4.4   APPLICATION DEVELOPMENT PROJECTS

Here, we will focus on investigating new ideas in application development through different projects. A set of names of possible projects and their details will be presented. However, students are encouraged to be creative and develop their own ideas in the given project descriptions.

1)   **Project Name: Cricket Training Management System**

Description

Design and develop a Cricket Training Management System to improve the quality of training. Assume there are many teams (according to their age and experience) and each of them need different training, different set of exercises, and different diet. With your system it should be possible to select a set of exercises and create a programme for each team according to their age and experience, and keep track of each team member and his/her performance. Also, it should include the attendance system to record, who did not turn up for a particular session. Your system should also prepare a diet chart for each and every member considering his or her age, height, weight, role, level etc.

2) **Project Name: Conference Room Booking**

Description

Build a software for online conference room booking on date and time basis, in order to better facilitate meetings and collaborative work for people connected the by local area network. This software helps any authorised person book a shared conference room from his/her desk itself and also shows the availability of a particular conference room at the chosen time and date. This software also handles various device booking such as an amplifier, video switch and projector etc. Also, this software can be improvised to send a confirmation mail to the user's id alongwith the booked timings and date.

4.5   NETWORKING PROJECTS

We will focus on investigating new ideas in networking research through different networking projects. A set of possible project topics, which will be presented. However, students are encouraged to be creative and develop their own ideas in the given project descriptions.

1) **Project Name: Advance Search Utility for Network**

Description

Develop a search utility for searching the different documents based on size (in bytes), type (e.g., html, doc, pdf etc), date-of-modification and contents (text written in document) from the different machines in a network. It will search the documents and indicate the source machine, file and other relevant information.

2) **Project Name: Simulator of Bus Network**

Description

Buses have been widely used in LANs (e.g., Ethernet) to inter-connect a moderate number of computers. This project develops a discrete-event simulator for a bus-based network with the intend of analyse system performance under different working conditions like:

- Performance on cable breakdown
- Performance on additional computers are added or
- Performance on heavy traffic
- Possibility of Data leakage
- Possibility of Virus infection
- Performance with Carrier Sense Multiple Access
- Performance with a bus master which controls access to the shared bus resource.

4.6   SYSTEM SOFTWARE DEVELOPMENT PROJECTS

Here we will focus on investigating new ideas in application development through different projects. A set of possible project name and their details will be presented. However, students are encouraged to be creative and develop their own ideas in the given project descriptions.

1)   Project Name: Advance Data Manager

Description

The way we organise our information and files, in the same way, develop an application, which will classify and group the files according to the user requirements like size, type, date of modification, contents and other logical relationships. Your application should create the different folders automatically and place files into them. For example: I have 36 files in my folder say ABC, and I want them to put in 4 folders named as 2003, 2004, 2005, 2006, which should contain the files, created in the years 2003, 2004, 2005 and 2006 respectively. For this task simply I will select the files and ask my application to do this work for me.

2)   Project Name: Voice Password

Description

Passwords are usually used to achieve secure authentication in a computer system. This project will require the student to come up with an alternative way of authenticating usage using a combination of voice words to authenticate users. The software should recognise the voice of each user uniquely and correctly.

4.7   WEB DEVELOPMENT PROJECTS

Here we will focus on investigating new ideas in application development through different projects. A set of possible project name and their details will be presented. However, students are encouraged to be creative and develop their own ideas in the given project descriptions.

1)   Project Name: On line election

Description

Develop a website for "On line election". The programmer should understand the constraints and real time issues faced during elections. For example: Let students of a college prepare for the elections president and other posts. Design a website which will show all the details of all the contesting candidates, their agenda, commitments etc. During the specific day students will securely contribute his/her vote. Voting should be secure; program should not disclose the identity of voter (e.g., who gave vote to whom should not disclose and should not be accessible any one). The voter should be able to vote only once. Voter authentication should be done properly.

2)   Project Name: On-line examination

Description

Online examination for objective and subjective questions. For subjective questions avoid the copy and paste function on the web page, only the keyboard should work in the Box's for descriptive questions. Timer should inform the student about the amount of time left. Questions should be generated

one after another randomly; select the question from the database. User name and password for each student should be checked properly. Automatically checking of objective answers, and for descriptive answer manually checking should be done. Provide online declaration of results.

The idea is to set up an on-line cost effective Test Engine. The examination department, the academy will maintain a question bank. The Controller of examinations will have the authority to modify the criteria for examinations according to the academy's rules.

The system will facilitate off-line evaluation of examinations and declaration of results. The system will allow experts to send in their questions to the question bank through this system. In general this system has the following objectives:

- To design an on-line cost effective examination and evaluation system.
- Fetch the questions randomly according to specific criteria from a large question database.
- Provide on-line evaluation and result declaration system.
- Use latest IT tools and Internet/Intranet technology to make a on-line Examination and evaluation system.
- To save the time of students engaged in learning advanced tools and technologies.
- To create a multi user application for conducting examinations and evaluating results on-line for intranet.
- Measure your skills.
- Certify your abilities.

4.8   LIST OF APPLICATION AND TOOLS

FRONT END / GUI Tools	Visual Basic, Power Builder, X-Windows (X/lib, X/motif, X/Intrinsic), Oracle Developer 2000,VC++, Jbuilder
RDBMS/BACK END	Oracle, Ingres, Sybase, Progress, SQL Plus, Versant, MY SQL, SQL Server, DB2
LANGUAGES	C, C++, Java, VC++, C#
NETWORK SIMULATORS	NS2, MIT'S, NETSIM, NIST, CPSIM, INSANE, NEST, REAL, OPNET, JAVA
SCRIPTING LANGUAGES	PERL, SHELL Scripts (Unix), TcL/TK
RDBMS/BACK END	Oracle, Ingres, Sybase, Progress, SQL Plus, Versant, MY SQL, SQL Server, DB2
.NET Platform	Dyalog APL, VB.Net, C#.Net, Visual C#.Net, Net, ASP.Net, Delphi
MIDDLE WARE (COMPONENT) TECHNOLOGIES	COM/DCOM, Active-X, EJB, WINCE, MSMQ, BEA, MessageQ, MTS, CICS
UNIX INTERNALS	Device Drivers, RPC, Threads, Socket programming
ARCHITECTURAL CONCEPTS	COBRA, TUXEDO, MQ SERIES
INTERNET TECHNOLOGIES	DHTML, Java script, VB Script, Perl & CGI script, HTML, Java, Active X, RMI, CORBA, SWING, JSP, ASP, XML, EJB, Java Beans, Servlets, Visual Age for

	JAVA, UML, VRML, WML, Vignette, EDA, Broadvision, Ariba, iPlanet, ATG, BigTalk, CSS, XSL, Oracle ASP server, AWT, J2EE, LDAP, ColdFusion, Haskell 98
WIRELESS TECHNOLOGIES	Blue Tooth, 3G, ISDN, EDGE
REALTIME OPERATING SYSTEM/ EMBEDDED SKILLS	QNX, LINUX, OSEK, DSP, VRTX, RTXC, Nucleus
OPERATING SYSTEMS	WINDOWS 2000/ME, WINDOWS NT, WINDOWS XP, UNIX, LINUX, IRIX, SUN SOLARIS, HP/UX, PSOS, VxWorks, AS400, AIX, DOS
APPLICATION AREAS	Financial / Insurance / Manufacturing / Multimedia / Computer Graphics / Instructional Design/ Database Management System/ Internet / Intranet / Computer Networking-Communication Software development/ E-Commerce/ ERP/ MRP/ TCP-IP programming / Routing protocols programming/ Socket programming.

4.9 SUMMARY

Projects also often form an important focus of discussion at interview with future employers as they provide a detailed example of what you can achieve. Projects typically involve adopting an engineering approach to the design and development of a software system that fulfils a practical need (including, for example, filling a perceived gap in the general software market). You can choose your project topic from the lists supplied in this unit. We encourage industry-related suggestions in our projects topics and novel applications within the sciences, education or government.

4.10 FURTHER READINGS

1.   http://www.rspa.com

2.   http://standards.ieee.org

3.   http://www.sce.carleton.ca/squall

4.   http://www.isi.edu/nsnam/ns/

5.   http://www.inrialpes.fr/planete/People/ernst/Documents/Simulator.html.