

Here are some suggestions for projects.

Many of these projects are best done as Web applications. However, if you wish to, you can create front ends designed for smart phones, which communicate with the backend (typically using AJAX).

1. **Online Spreadsheet:** Implement google spreadsheets (or a subset of it), allowing users to create spreadsheets online. Optionally integrate it with the access control project. Optionally deal with concurrency control issues.
2. **Form application creation system:** This was done partly in 2010, but needs more work to make a system where you can create form applications (kind of like moodle's quiz system, which allows creation of quizzes which students can answer, but with a lot more features).
3. **TA allocation system,** which takes student preferences, faculty preferences for students, course TA requirements (including prereq courses/minimum grade) and comes up with an allocation.
4. **Project allocation system,** which allows faculty to float projects, students to indicate interest in projects (with a hidden preference order), faculty to choose students (again with a preference order), and final allocation to be done based on these factors. Speak to recent faculty advisors to get more ideas on the issues involved.
5. **CourseRank:** This system developed by a few undergrads at Stanford under the guidance of DB/IR faculty there, and apparently a big hit there.
<quote>CourseRank, a social site where Stanford students can review courses and plan their academic program by accessing official university information and statistics, such as bulletin course descriptions, grade distributions. Students can also provide information, such as comments on courses, ratings, questions and answers.

At our site, (<http://courserank.com>), visitors can see a video with student testimonials and a demo (demo tab). A paper is available at: http://www-db.cs.wisc.edu/cidr/cidr2009/Paper_85.pdf

CourseRank offers powerful tools geared to our domain, for example, a tool for planning an academic program (Planner) that checks for schedule conflicts and computes grade point averages, a tool that checks if requirements for a major have been met (Requirement Tracker), and a tool for searching and browsing with help from a “tag cloud” (CourseCloud). CourseRank also offers a tool for “flexible recommendations” (FlexRecs) for the site administrator. This tool lets the administrator quickly define recommendation strategies.”</quote>

6. **Access control for a Wiki site.** The access control should be based on roles such as faculty, student, with a role hierarchy (UG student, PG student under student) coupled with organizational-units, such as CSE department, H1, etc. User-role-organization-unit mappings can be partially taken from LDAP, but also added to in your system (e.g. Sanyal-HOD-CSEDept). Access control lists (ACLs) contain a list of role/org-units; a resource can specify one or more ACL explicitly, and in addition can inherit ACLs from parent resources. Permissions include read/write/admin. Your code should be based on a

database but you can hack up your favourite wiki to access your code and decide on who can do what on the wiki

7. **Timesheet Software:** Project students can use the software to log the work items and effort spent on it (weekly/daily), meeting notes with the faculty etc. The tool would show a number of options to generate various kinds of reports from this data. These reports would be useful for the student at a later point of time to recollect everything about his work.
8. **Resume Generator:** The tool will present a user with a UI to input all the necessary information to be put in his resume. As soon as a student submits his information, a notification would be sent to the department placement nominee(DPN) for the verification of the resume. The DPN would schedule an appointment for verification with the student. After the verification, the student will be shown a button to generate a resume. On clicking the button, a latex document for the resume will be created internally and a PDF will be generated and presented to the student.
9. **Department room allocation and tracking system:** Identifies which rooms have been allocated to which students/faculty, what is the area/capacity of each room, multiple views such as who is in a room, or which rooms/parts of rooms have been allocated to a faculty member or his/her students, etc.

Bus Utility System (BUS)

Management/Reservation system for buses

Features:

Enable users to search for buses from/to any location with parameters like time,date,class,cost,quality

The users can have their profiles which will have data based on user specific reservation history. This will be used for quicker/beneficial(discount/offers) future bookings for the user

Have an interface for bus service providers to register themselves and add information about their bus routes.

A very user-friendly informative UI

Buses can have intermediate stops as well which will be considered while booking. Also in case of no direct buses, a connecting route will be given as an option.

Incorporate user feedback system for transparency

Additional Features:

- Auto-completion of origin / destination station

- Additional revenue generation for "us": Show user trend specific advertisements

Topic: Personalized News Aggregator

Abstract:

The goal of the project is to build a Web-application which provides the user with the latest news stories from the Internet, personalized to suit his/her preferences. The important tasks towards achieving this goal should be along these lines:

- 1) Crawl different websites for news stories, or better, make use of a public API that provides news content (Digg API <http://developers.digg.com/>, FWIX <http://developers.fwix.com/>, etc)
- 2) Analyse/tag the news items into appropriate categories. The categories are to be stored in a relational database. We can make use of Wikipedia-based ontologies (DBpedia, Freebase) to populate our category structure.
- 3) Store user preferences based on explicit ratings from user and past browsing history, as another relational model. Again, the publicly available topic ontologies will be of help over here.
- 4) Rank the obtained news items according to the user preferences, using some classification/clustering algorithm. We can decide the level of sophistication of the algorithm to be used depending on the remaining time to project deadline and expected effort.
- 5) Present the ranked news items to the user in a simple and intuitive web-interface. Possible extension: Build a Google Talk chat bot which will provide the above functionality directly through the GMail inbox (<http://code.google.com/appengine/docs/java/xmpp/overview.html>). For example, on adding the bot to the chat list, the bot will automatically send chat messages to relevant users when a new news item arrives, somewhat like a personalized RSS feed.

The use of relational databases is more or less confined to steps 2 and 3.

Depending upon the feedback from the professor regarding the expected effort required for the proposed project, we would also like to incorporate a MapReduce component in step 2, where the analysis of different news stories would be done in parallel, possibly on a Hadoop cluster, or using Amazon's EMR.

Interface to Placement Training Cell (IIT Bombay)

INTRODUCTION :

We propose to make a web interface for the Practical Training Cell of IIT Bombay.

Access Levels: The interface will provide separate logins to companies and students as well as placement coordinators.

The database will comprise of list of all the students, their CPI's, dept_name, PTC cell registration, year, courses completed and resumes.

The database of companies will comprise of the type of company, no. of interns they plan to hire, departments and year of students it is interested in, category and other requirements and

info.

Companies will be allowed to add jobs/internships for students and list the criteria while the students who are eligible can sign or not sign the application for the internship from their side.

NEWS FEED : We plan to add something like an update section for every student that will show updates about internships and other notifications concerning the student who is currently logged in.

AUTOMATED LISTING : A student can apply for all those internships he is eligible to apply for and a company can see a list of all students who have applied along with their details. Plus, after the selection procedure for a company is complete and the students are finalised, the corresponding PT Blog will be automatically updated. Also, further actions include deregistering students if they have been selected for some internship.

RANKING : If several students have applied for an internship, then display a list of all those students who have applied and sort them according to their CPI. So, a student can approximately guess his chances of getting shortlisted.

Virtual FIFA

We will be implementing quick and virtual simulation of a football match using statistical and probability tools

We will be using an intensive database of players and teams from different clubs and countries. The schema will contain attributes of each player for ex. Strength, agility, speed, acceleration etc. Also there will be team attributes like chemistry, formation etc.

We will be using attributes of teams and players both while deciding outcome of any match.

Options for building one's own squad will also be provided. One can play their own squad in standard tournaments.

ACADSTODAY

We plan to develop a Web interface to help students get more familiar to the courses they are taking during their curriculum. It can be used in any general institute where there are courses and instructors. Every student will have his own login which is his identity during all the interactions with the website. All the data will be stored and maintained in a common database on the server.

It can help students in numerous ways. Every general course will have its rating and reviews on it so that one can choose between two based upon his/her interests. One may contribute by uploading course related material onto the website and help the current and future takers of the course. Uploads include daily lecture notes, ebooks, research papers e.t.c. related to a particular course. Every upload will have

its rating too to benefit good materials over others. Now coming to the instructor, we will have similar features related to it too like comments and rating. All the above data will be will be for long term purposes i.e. guiding purposes.

Coming to the current updates about the course and instructor, we have an news section wherein one can post any academic or student related news, which will then be displayed on the walls of other students(users). Key implementation is the tagging option with the news post, for e.g. we will have choice of tagging any number department, course and instructor depending upon to whom is the news more relavant to. It would also help in news filtering. By default we plan to display every institute news on the user wall(latest first), but one may choose to filter by department or course or instructor depending upon his/her concerns. These are the short term purpose features of the project.

Apart from filtering news we are implementing search on user, course, instructor and course material which would display the relavant links (regarding the search keyword) to information and reading materials uploaded by others, in order of their rating (most rated first). This would help the user get to useful information very fast.

Finally, to avoid spamming we include institute LDAP authentication during registration in Acadstoday.

Resume generator

We would like to make an interface for students to submit their details and edit them depending on permissions given by mentors.

Mentors will be provided with the information submitted for verification.

Once verified the resume will be generated and student can download it whenever he/she wants.

INTERNAL SOCIAL NETWORKING SITE openUp

We have planned to make a social networking site on the lines of facebook and orkut. We have named our project openUp. openUp aims at connecting all the students of IIT Bombay through an internal networking site, just like people are connected on facebook. The main features that we are going to implement are:

User: The most important thing, the heart and soul of any social networking site

Wall: The feature taken from facebook. The wall basically stores the updates of all the users and keeps the friends updated about what their friends are doing

Status, Photos and Videos: Every user has the ability to post new status message, new photo or a new video on his wall or on other's wall

Groups: There will be groups or communities relating people sharing same type of interests. Activities

on the group's wall will be available only to those users who belong to that group

Search Feature: This feature will be used to search for other users on openUp or any group

Likes and comments: There will be an option to like, unlike or comment on a post, video or photo

Notifications: Just as people receive notifications on facebook about the friends' updates related to them, we are going to implement notification feature on openUp as well

Other interesting stuff: These interesting stuff depends on how much we go on our project. Some of the things that we are thinking at this time are fans, testimonials, etc

We are planning to implement this by creating tables corresponding to various entities and relations.

We are actually storing a social graph in the form of these tables and we will use graph algorithms and use SQL commands to retrieve information from the graph and the interface will produce necessary and interesting information to the user

Limitations:

There are some limitations like:

We are implementing upload of photos and videos only in the form of a link as storing the actual photos and videos require a lot of space

We are going to store a limited number of notifications and feeds in any user's wall or stream as otherwise, we will be short of space after there are a lot of users connected to openUp and start using openUp frequently

At present, we are not going to implement the chat feature. We have the feature of sending private messages though

Following are the few proposals for course project:

a) Internship Portal: We will like to start designing Internship Portal from scratch keeping in view of students, company and administrators. Few tasks that we want to perform are as follows:

1) Students can upload resume (in pdf format) in a restricted timeline, sign iafs, view iafs, shortlisted candidates, result etc.

2) Company can create iaf, view student details who have signed the iaf at any point of time after opening the iaf, download zipped folder of resume of students who have signed the iaf, can generate form to extract additional information about students etc.

3) Administrator can verify iaf, verify resume, register and deregister students and company, edit details of student data

4) Data encapsulation: Privileges on the data that should be shown to a user depending on its role.

b) Room Allocation Interface: We will like to design room allocation interface in which students, professors, student bodies can view status of any room, guesthouse, auditorium etc and book the room

if available or if the waiting status is within certain limit(to be decided during implementation). User can book a room as well as cancel the booked room, can view the current status of the room being sought. Priorities will be assigned to a request depending on the user role given the request status is pending.No data encapsulation done in this case.

1) Social Library

A library with all the normal book library features, ability to add, remove, issue, search books with rectification of current problem in (non-working) search engine of IITBombay's central library.

Also, Suggesting books that your batch-mates and course mates are reading. What books are being used by students registered for some particular course.

Choice of Making your profile private, and not displaying your choice of books to other users, and depending on users choice, track of fact that who is inside library at this time, recorded with help of i-card while entering library.

Some other tasks involved in project - login/password, connect with facebook acc., study facebook connect API, Fast search algorithms, machine learning approach for understand social relationships,

This project seems quite unique of its kind & has high usability & feasibility. I have great interest in Social networking, and got a basic knowledge of social networking during my Internship at Facebook, and i am willing to put it into real life use.

2) Food Places & reviews

A place where you can search for a restaurant according to your choice of food and near by place and price range, and can easily find high quality, high ranked restaurant according to users feedback and reviews.

We will make categories based on place, restaurant names, food - type, Price range, star ratings and others.

It will involve work related to creating a login system for general users and restaurant managers, search engine for food-items/menu based on various parameters, google map API, Facebook connect API, clustering system based on past food preferences, price range liked. Way to add restaurants, submit reviews, and ratings based on food quality, noise/spam removal, restaurant timings, credits for users, and measure user activeness and usefulness to site. Posting questions and Adding email notification required to notify user about various things.

ONLINE SPREADSHEETS :

Implementation of a subset of google spreadsheets, allowing users to create spreadsheets online.

Optionally integrate it with the access control project. Optionally deal with concurrency control issues.

Each relation(table) is modelled as a spreadsheet. Foreign key constraints are imposed by allowing referenced fields to be selected from a drop down menu which is dynamically updated. We will try to implement more complex constraints like regular expression constraints or type constraints for fields.

Proposal 1 : User Browsing Statistics

Motivation: The browsing statistics of various users are recorded and utilised efficiently by various companies like google , facebook,etc... But there is no such organised record at our disposal so that we could keep track of our activity on web .. what we do most .. what we like the most ...

Implementation:

could make a browser extension which keeps track of user statistics , pages he goes through, the time he spends on each page, the no. Of clicks and store them in a database in an organised manner

We could now do a lot of things with the data collected

Match people based on their user statistics and give recommendations/suggestions which might be of interest to a particular group (or suggest each others' activity)

Store the pages in a priority based manner (priority – time, no. of clicks etc...) hence keeping record of his preferences.

Proposal 2 : Virtual Stock Market

Motivation : Provide a user friendly platform for people to understand the stock market and have a

hands on experience on the functioning of the market thus helping them gain a real time experience of the market .

Implementation:

Maintain a record of all companies which provide shares , their prices, fluctuations in the prices, current and past records.

A user portfolio which keeps a record of all the transactions . All the shares bought and sold .. his budget .. profit/loss .. etc...

An online interface which represents a real time stock market with the user actively involved in trading shares .. real time graphs of the share prices of companies .. fluctuations ...

We could have a newsfeed which could help the user understand the current situation of the market and hence make intelligent decisions on the basis of the same.

Proposal 3 : My Personal Customized Diary

Motivation : There is no proper online platform for a person to write his diary where he can express

his daily experiences . One option is writing it using pen and paper but referring back to memories becomes tedious . So here comes an online interface which allows you to regularly update your diary whenever you feel like it.

Implementation :

An online interface where user can login and update his diary . When a user logs in he gets his own◇ personal customized version of his diary . He can also add pictures , videos .. as tokens of memory.(because somethings can't be expressed in words :P)

We could include sharing features for each page of the diary .◇

We could have the concept of an event wherein people who might have been involved in a particular◇ event could share their experiences (We could also enable tagging features).

A search feature which helps scan through all his previous entries.◇

We could also have a concept of a mood wherein a user defines his mood while writing a page and◇ the same could be used for search purposes later.

The E-Plan

Description:

This project, basically an event planner, is a database management and java servlet based application, which has following functions.

Tasks: This application contains tasks, which can be given by one user(say admin) to any other user. These tasks basically come with deadlines, people it's assigned to, and all.

Sub-tasks: The tasks described above can be divided into sub-tasks, which can be further distributed among the users and which sets a team and a manager for each sub-task. These also come with deadlines etc...

Calendar: There is a calendar, which hosts many things. This calendar, contains all the events like meetings, which can be among the whole team , or specific team members. The events can only be added by specific people of the team.

Files: There is a section in the application which gives users a facility to share files related to a project, along with task description and all. Visibility of the files can be set accordingly.

Forum: There is a forum to encourage discussions among the users on the topic of the task. Each post comes with poster, task and sub-task related to, visibility and all.

Messages: There will be a section in the application for messages, which will be private messages sent among the users. These messages will be unread at first and users can find any new message arrived in their message box.

Technical description:

This mostly will involve tables for all the options listed above, different functions like select, delete and update will be used in them. Java servlets will be used to provide a good interface for the application. Connections will be used in forums, events and all. Views will be used on the front page and also wherever possible. Recursive functions and all will be used for mail boxes to put the facility of replying to the message directly. Flags will be used in mail boxes. Will look into possibility of using triggers in automatic mailing for tasks.

Further possibilities:

Online spreadsheets: This project can be extended with a facility of sharing a document or a spreadsheet over the wire, which will be both created and shared online, saving the time for upload and download of files.

Mailing: Without sending a message to people to their message boxes, it can be used so that messages will be sent to GPO, increasing the scope of it's usage.

Idea 1:-

IIT Bombay query forums. Basic motive behind this is to create a medium of communication between people who want to know a person good at so and so etc or want to learn about something. For example a person want to contact poeple preparing for CAT in the insti, he can post it in the academic forum and some user may answer that. It needs publicity initially, for which we are planning to contact DC hub owners. We divide the forum into many fields like music, arts etc. People can choose and change their visiblity of forum questions. All the users related to a particular post will be sent updates on that post.

Idea 2:-

Maintaining a online music store for iitb..where people can listen to songs over there...We take music from the logined users i.e intially people have to share their music and we will take care that there will be no repetitions while uploading. Later they can create playlists on the website and listen to them online.Users can give rating to songs. Songs will also be classified as top rated by users etc.

Idea 3:-

we take inputs from the person's fb, google, tweet streams process it and organize it. Then suggest all his friends based on data collected. we can schedule games among friends say tennis, baddy (if we want partner). In short, suggestion website- suggest everything - movies, games (schedule it), films.