

Circle K	A system to enable uniform pricing policies for this major convenience store chain.
Midwest Proton Radiotherapy Institute	A system that helps track patients through the therapy process.
Office of Admissions, IU	A recent project provided a web front-end to a system, first done by Information Systems students in 1989, that tracks transfer course equivalences.

WHAT CLIENTS HAVE SAID ABOUT THE EXPERIENCE

“They listened to our needs, recommend appropriate software, devised a menu approach to locating software, and made the system as user-friendly as possible. The final product was ready at the end of the semester in May.” – Community Service Council in awarding the Community Service Award to the project team.

“Many thanks to you and the development team for the wonderful software!” – Kevin Beuachamp, Classic Pyx

“The system meets and exceeds our original specifications. . . . In some instances it seemed that [the team] had a better understanding of our requirements than we did.” – Rebecca Hanson, Chemistry Stockroom

“It was a very professional team & fun to work with.” – Curt Bonk, CourseShare.com

“The system is very intuitive for us.” –Derek Cahill, Circle K

INFORMATION SYSTEMS COURSE PROJECTS

The team projects expose students to problems faced by software developers in the workplace and give them tools to overcome those problems. Over a two-semester period, a team takes on all stages of software development – from securing a client and assessing needs to creating a user documentation for the finished product. Along the way, members learn to meet interim deadlines, develop team skills, and fine-tune products to fulfill the changing goals of the client. In addition to the project development work, students read the latest research on software development and meet with members of other teams to share their experiences.

Each team is composed of four or five seniors and beginning graduate students enrolled in Software Engineering for Information Systems (P465-6 for seniors, P565-6 for grads) and is supervised by an advanced graduate student enrolled in Software Engineering Management (B665-6).

The uniquely interrelated courses provide a firm foundation for the project’s success. Our confidence in the validity of our approach is high, because of the positive feedback we have had from the employers who have hired veterans of both the project course and the supervisors course. The well defined and carefully monitored project milestones enhance the projects success. Quality Assurance is emphasized for both the development process and final product.

PROJECT MILESTONES Items marked “●” have major documents or other deliverables.

- Project proposal (completed mid September).
- Feasibility study (early October). Final project selection and team formation are based upon feasibility studies.
- Specification walkthrough (late October).
- Requirements Specification (early November). Clients will be asked to sign-off on this document.
- Prototype (late November).
- Preliminary Design and Test Plan (early December).
- Project presentations (mid December).
- Design review walkthrough (late January).
- Detailed Design (early February).
- Coding complete (early March).
- Testing and integration complete (late March).
- Installation complete, Programmer’s Manual and User Documentation (mid April).

CLIENT REQUIREMENTS

There is no charge for the software design and development but that does not mean that clients are without obligation. As with all information systems projects, this project will only succeed if the client devotes time and effort interacting with the project team while they are specifying and developing the system. Also, it is the client’s responsibility to provide sufficient access to the hardware and software platforms on which the project will ultimately be implemented. It has usually been the case that teams can find development facilities on campus which are sufficient for most of the project; but during the later stages of the project, access to the final target environment is vital. There is no requirement for particular hardware or software beyond suitability for the task at hand.

Since data input is often an important part of system validation, the client’s staff should expect to do some experimental data entry in the spring. The project teams will help convert data from existing computerized systems but they are not to be expected to do bulk data entry.

Since a successful information system must adapt to changes in needs and in the operating environment, clients are advised to have a plan for ongoing maintenance. Unfortunately, because the project is tied to the academic calendar, follow-on maintenance will not be available through this course. However, “design for maintainability” is a major theme of the software process used in the course.

PROJECT SELECTION

Since every student in the class proposes a project but projects are developed by teams of four students, only one quarter of the proposed projects can be implemented. Some of the considerations that go into the selection of projects are described below.

Evaluating projects requires a careful balance between the needs of the client, the feasibility of the project, and the pedagogic needs of the students. Even though the projects are first and foremost a “laboratory” experience for students, we have found that there is no compromise of the academic experience provided that we exercise due diligence in project selection and monitoring. Since concepts of project *quality* are fundamental to the course material, good pedagogy leads to successful projects.

Since the courses focuses on information systems, we require the projects to have a substantial information component. The projects must be of the right size to be completed by the team during an academic year; projects that are too small but otherwise suitable are saved for students wishing to do an “Individual Programming Laboratory.” Projects must have well-defined goals; although the projects begin with a thorough study of the requirements, there is not time within our strict schedule to refine a vague wish such as “computerize our office.” However, a project may be an exploration of how a client’s operations may be redefined by a new information system – a “deep prototype.”

Availability of the hardware and software environment for implementation and operation of the project must be assured. This equipment need not be on hand at the beginning of the project, but there must be a commitment to acquire any necessary hardware and software before the beginning of the second semester. In fact, several teams have worked with their clients to specify hardware and software acquisitions.

WHAT STUDENTS HAVE SAID ABOUT THE EXPERIENCE

“This is a way to come up with a product designed with careful thought and following strict guidelines. The end product is very good, and it’s free.”

“It’s good to go through the step-by-step planning and laying out of a major project. For most students, it’s the first time they’ve really depended on other students.”

“The group project provided invaluable practical exposure.” – CS alumnus after several years as a computer professional

“We thought there was too much emphasis on design until it was time to program. Then we understood because everything fell into place really easily.”

FURTHER INFORMATION

Two papers describing the course from an academic perspective are available at <http://www.cs.indiana.edu/database/Publications/index.html#pedagogy>. The course web page is <http://www.cs.indiana.edu/l/www/classes/p465/index.html>.