

NDSU

Department of Computer Science



Overview

During their final semester, students with majors in Computer Science (CSCI) take part in a Capstone project. The objective of the Capstone program is to provide the students with an experience that brings together the technical knowledge that they have acquired, as well as to gain valuable teamwork skills. This is accomplished by working in small teams on “real-life” projects. Capstone projects are done in conjunction with corporate, industrial or government clients/sponsors.

CAPSTONE PROJECTS

Outcomes – for students

Learn project management skills including identifying cross-functional roles and relationships, managing resources (people, time equipment, etc.), enhancing their ability to deal with others in a team environment and improving communication skills essential to planning, influencing, integrating, reporting and documenting of projects.

Follow project management processes for project initiation, planning, execution, control and closure.

Follow SEI CMMI like processes for software development.

Typical projects will include software development which will be done by following good processes for defining requirements, analysis and design, coding, testing and final integration and acceptance testing.

Outcomes – for clients/sponsors

Completion of a small project by NDSU students at little or no cost to the client/sponsor.

Satisfaction in having helped students learn about working in the “real world”.

Getting to know new upcoming graduates and establishing more contacts with NDSU.

How Capstone projects work

During the fall semester clients/sponsors are contacted to discuss their willingness to support a Capstone project during the spring semester. The size of these projects is discussed with the Capstone coordinator during the fall but the exact content/statement-of-work is negotiated with the student teams at the beginning of the spring semester. It is very important that the sponsor provide a champion/mentor to provide guidance and answer questions for the student team throughout the project lifetime.

At the start of the spring semester, students are presented with a list of clients/sponsors and their proposed projects. Students then apply for team membership for the projects, and teams are assigned. At that point, student teams start meeting with their clients/sponsors to complete a needs analysis and to negotiate a final project definition and statement-of-work. Once this is accomplished, project teams divide the tasks and individuals start working on their assigned tasks. It is expected that the student teams have regular contact with their champion/mentor where progress and direction are reviewed and questions answered. Student teams also meet regularly with the Capstone coordinator.

A secure web site will be set up for each project where information related to the project can be accessed by the student team, sponsor/mentor and instructors. This allows everyone related to the project to be able to have access to the latest information related to the project at any given time.

It is expected that at least two formal presentations will be made to the client/sponsor during the semester. One will be approximately half way through the semester giving an update on progress to that point and the second at the end of the project where a final report will be presented.



Sample companies:

Clients/sponsors of previous project include the following:

ATK
CNSE
Forum Communications
Honeywell
Infinity Windows & Doors
IBM
Microsoft
Noridian
Phoenix International
Polaris
Sundog
Thomson West

Sample previous projects:

Develop a simulator for radio communications to a munitions system that is modular and can be upgraded for other communication simulations.

Develop a visualization capability for a newspaper website that can be used to display election results.

Develop an extensible framework for a suite of automated test cases and an initial set of test case modules that run on a Linux platform that simulate Denial of Service and Intrusion attacks.

Design and develop a sales proposal and job set-up program for a heating, AC and plumbing company that will allow the comfort consultant to efficiently and effectively produce a "job specific" price quote for the customer on the first appointment thereby increasing the opportunity to close the sale immediately.

Design and develop a system to ensure data integrity between an engineering database and the corresponding manufacturing database.

Add a digital dashboard to a manufacturing line (info on first pass validity, scrap produced, board/unit yield) - three separate projects for analysis/design/dashboard development.

Develop a web-based employee directory that can find employees in a hierarchy list. View the list, add picture ID's and update Active Directory from the source data.

Create a citation mining tool interface to enable team members without SQL skills to run reports and perform analysis.

Design and develop a web-based trouble logging system.

Develop a pattern recognition algorithm for finding and converting text-based numbers to digits in documents.

Develop a process and web-based system to support competitive benchmarking in all product groups and support teams. Products include snowmobiling, ATV's, motorcycles, etc.

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