# Computer Software Team Simulation and Module Development

## TJHSST
## Computer Systems Lab Research Project, 2005

Problem Statement

Our project has a two-fold purpose, first to simulate a professional computer software development team and secondly to produce useful technology supplements to formerly paper-based processes at Thomas Jefferson High School for Science and Technology. More specifically, we will produce web based alternatives to application and selection processes.

Project Goal

The goal of this project is to efficiently and effectively emulate a computer software development team. A successful team will be able to produce relevant and usable products.

Abstract

We subdivided the group members to fulfill a variety of positions required to run a successful computer software development team simulation. Mr. Strong, our advisor and teacher, played the role of a corporation manager, detailing the broad requirements and products our group needed to produced. Within the group, we could further subdivide the components of the project, along with the necessary documentation. While any member of the group could essential complete all the necessary tasks, we furthered our efficiency by specializing individually in code implementation, research, documentation and revision and managing. Many of our group members are specialized for multiple tasks.

The Roles of Our Various Group Members

Because our efforts to simulate a professional development team, we segregated ourselves into various units with the following primary tasks:

*Programming:*

*The purpose of this unit is to produce the code that produces the modules that the consumers, usually the students and teachers at Thomas Jefferson High School for*

*Science and Technology, will use.*

Curtis Kobelski
Kurt Gallagher
Chris Bengston
Bryan Flemming

*Documentation:*

 *The purpose of this unit is to produce a manual that the consumer or future programmers can use to run the modules.  It is an essential part of any module that wishes to be effective in the long term.*

David Banh
Sarah Wise

*Management:*

 *The purpose of this unit is the resolve disputes within the other units and disperse the work that needs to be done within the other units to produce successful modules.*

Bryan Flemming

*Public Relations:*

 *The purpose of this unit is manifold.  It seeks feedback from the consumer population and presents them to the management in a way that can be easily interpreted. It fosters communication between the consumer and the development team and makes manuals and instructions available.*

David Banh
Sarah Wise


Method for Solving Problems and Accomplishing Goals

 Because our goal is to effectively emulate a professional team, appropriate participation in the process itself accomplishes this goal.  Solving problems must occur through either one of the predetermined software development life cycles or through an innovative new system.  For the majority of the project, we have been using the Waterfall Development Method for problem solving.  The Waterfall Development Lifecycle requires that each step of the task at hand be completed before the next step in implementation begins.  Unlike the Spiral Model, it does not allow for divergent steps of the life cycle to occur concurrently.  However, it decreases the complexity of the role of the team manager, thus allowing him or her to work additionally as a programmer.

 At various points throughout the year, the waterfall method has failed, often significantly.  During these times, problem solving was reduced to the Chaos Model,

which uses a much less formal version of either the waterfall, iterative or spiral models. The Chaos Model, rarely used in the professional world, is, in the end, an "analyze" and "immediately solve" technique. In its own simplistic way, it is nevertheless a viable and often effective method, especially for problems of a limited scope.

Module 1:

Techlab Selection Module

The Techlab Selection Module was the first task we were given. The purpose of the site was to allow a large number of students to log in to a secure website, select a course from a database-populated list, and complete an application form including short-answer questions and personal information. Additionally, we constructed a complement teacher's site which allowed the teachers to view student applications, stratified by student preference for the lab as first, second, or third choice. The teachers could review the students' responses to the questions and the prerequisite courses he or she had taken, and from there to accept or reject them. In a completely paper-free process, teachers were able to process the applications slightly more than 400 students and track their acceptance into the various labs to which they applied.

The creation and perfection of such a site required the attention of four programmers. The first task was the construction of the site itself and the acquisition of a database and the pertinent data, which also allowed for us to secure the site as we used Intranet information to allow the students to login using their school user names and passwords. Kobelski was responsible for both user interface and code efficiency, ensuring that the multiple programming languages of PHP, SQL, and html worked together as necessary. The layout of the site was a project in and of itself; Bengston designed the graphics and color scheme in addition to

Other than the programming aspect of the project, the gathering of HCI information was perhaps the most formidable issue. Constant communication with the teachers and Mr. Berenty, the former Techlab application manager, was necessary to ensure that the required information was gathered and that the proper resources for both students and teachers were provided. The instruction sheets, formerly distributed manually, had to be formatted, and instructions for both sites were written to ensure that the outcome of the selection process would not be impacted by the new medium. User feedback was an important part of the jobs of the non-coding members of the team, who regularly met with Mr. Berenty and the Techlab teachers to show them the latest iteration of the sites and to ask for their input. The opinions of the student users were also taken into account in designing and documenting the site, and many rounds of clarification and simplification resulted in a final product that was both effective and user friendly.

It should also be noted that the sites were designed with their long-term implementation in mind. They are easily maintainable and will require only slight modifications to be ready for use in the next round of Techlab selection. Thus, the ramifications of our project will continue to be felt for a considerable time.