

# Student Employment System: The Pros and Cons of Building a Homegrown Application and Using Student Programmers

Andrew Stutzman  
The College of New Jersey  
Ewing, NJ 08628  
1-609-771-3130  
stutzman@tcnj.edu

## ABSTRACT

The College of New Jersey has recently completed an enterprise application that controls job postings, student application and employment contracts for on-campus jobs. The departments of Enterprise Applications and Career Services collaborated together to design and develop the Student Employment System with help from student programmers in our Computer Science department. This paper will review the functions of the system as well as the pros and cons of building homegrown software and using student programmers.

The Student Employment System allows departments on campus to post jobs and students to apply for those jobs on-line. Career Services manages the approval process of jobs and applications and contracts the students for their employment term. The system took over two years to develop and build. Initially student programmers were brought on to work with the design and programming of the system until problems arose when feeding payroll information to the new PeopleSoft HR system.

## Categories and Subject Descriptors

H.2.8 Database Applications

## General Terms

Management, Design, Reliability, Experimentation,

## Keywords

Student Workers, Student Employment, Oracle, Perl, Databases

## Student Employment System Overview

The College of New Jersey has recently completed a full scale launch of the Student Employment System. This system was developed with collaboration between the Career Services Department and Enterprise Applications using student programmers and full time staff.

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The Student Employment System (SES) contains the ability for on-campus employers to post jobs online. Those jobs, pending approval by Career Services, are available for students to view and apply for. Once a student has applied for a job the employer can hire them. Career Services can then issue a student employment contract. SES can then upload the student's employment record to our payroll system.

This centralized process allows The College of New Jersey (TCNJ) to quickly hire students and ensure that they are getting the correct rate of pay while allowing employers to quickly find workers. SES also allows Career Services to easily track Federal Work Study students.

## Student Employment System Functions

**Employers** (on-campus departments)

**1. Post new jobs.**

Faculty and staff can login and post a job for their department specifying the rate of pay, qualifications and hours.

**2. Hire/Reject Student applications.**

Once a student application has been approved by Career Services, employers can view the application and contact the student. They then have then mark the applications as hired or rejected.

**3. View a list of all hired students.**

SES keeps a list of all the students that individual employers have hired in the past along with the jobs they have been hired for.

**4. Rehire past students without them having to apply.**

Students must be re-contracted from year to year and in the summer break. The system allows employers to easily rehire past students and avoid the application process.

**5. Close jobs and recreate old jobs.**

Employers can close out jobs as they hire students. This takes the job posting off of the public list. They can easily repost or recreate old jobs with just a few specifications.

## Students

### 1. View job postings.

The job postings that have been approved by Career Services are publicly available for students to browse. They are initially listed in order of approval but can be sorted by the column headings. This allows students to quickly find the jobs they are looking for.

### 2. File an application.

Once a student has found a job they interested in they can apply for that job by logging. The first time they apply SES collects some personal information. After that their applications are processed as soon as they verify themselves via their login.

## Career Services

### 1. Approve/Edit Job Postings.

Job postings must be approved before they are posted publicly to students. This helps keep the data clean and to ensure that there are no fraudulent postings.

### 2. Approve/Edit Student Applications.

Student applications must also be approved before employers can view them.

### 3. Add/Change standard rates.

SES keeps track of all the standard pay rates and earnings codes that are necessary to process the student payroll. Career Services can adjust these as necessary.

### 4. Search Student History

A search feature has been added to allow Career Services to review a student's employment history. They can review the number of applications submitted by an individual student and how many past contracts that student has been given. They can also easily clone past contracts when students have been hired or generate brand new ones.

### 5. Process Payroll Data.

As contracts are generated the data must be sent to the Payroll department for input into our human resource system. The data must obtain all of the proper fields, codes and rates in order to be processed correctly. This insures that students will receive their timesheets and be paid correctly.

## Student Programming History

In the year 2000 User Support Services, a sub department of Information Technology, created a team of student programmers. This group was dubbed with the cumbersome name of Departmental Applications Development Team (DADT). The goal of this team was to convert some of the college's inefficient and overwhelming paper processes on campus to online forms/applications that could store the data into a database.

The term "departmental" in DADT quickly became obsolete as three of the first projects the team received were creating an online adjunct contract/payroll system, an online grant management system, and a student employment contract/payroll

system. From the beginning this team has been overwhelmed with incredible tasks. Unfortunately, lack of experience on User Support Services part with software development projects and the insurmountable tasks presented to us, quickly put DADT in over their heads.

The team was fortunate when hiring as most of the workers obtained were honors level students from the Computer Science department. Their skills helped develop DADT into a determining factor in the Information Technology department. The campus has come to rely on DADT for more than 30 different web applications. Some of the larger applications include web based media equipment distribution software, adjunct contracting system, information technology budget item system, campus tour reservation system, and a dynamic faculty and staff directory.

The most difficult aspect with DADT was not with the team's technical skills but with project management skills. Obtaining concrete specifications from clients and developing change management and sign off procedures was not part of the team's skill set. This led to problems with clients changing specifications and adding key workflow items into the program at the last minute and functionality being added to production environments without proper testing or sign-off. The lack of project management skills and direction caused delays and problems with some of the larger projects. Projects, such as SES, have taken two or more years to develop fully.

In 2003 Information Technology at TCNJ recognized the needs of DADT and moved it out of the User Support Services department and into Enterprise Applications. Enterprise Applications had the project management experience and support for the work that DADT was involved with.

However, even with the problems mentioned, DADT has been able to develop web applications for 15 different departments as well as campus wide applications. DADT has also been able to provide students the work experience needed when applying for jobs after graduation. Half of the students that have graduated from the team have ventured into graduate school. Some have gone directly into doctoral programs.

The student that was chosen to work with SES had more experience than most with database applications. His developed skills and experience were the driving force behind the concrete software design for SES.

## Student Employment History at TCNJ

In the past, Career Services handled student employment via a cumbersome paper process. It could take anywhere from 2-3 weeks to post a job and hire students and get them contracted. This often led to problems with departments trying to go around the process and hire students on their own which would lead to students not being properly contracted and paid.

The process was initially helped along with the wide use of email on campus and from a detailed web page for Career Services where jobs were manually posted for all to view. However, the mix of people using electronic communication and the standard paper process quickly became overwhelming and confusing.

Career Services contacted DADT in the beginning of 2001 to develop a process that could be completely web based. Work began on the project that spring and moved into development in the summer of 2001. By August 2001 DADT had a proto-type running which included the workflow for employers to post jobs and students to apply for them. Career Services used SES to collect the job and student information, then manually transferred that data into a FileMaker Pro database which they had been using for several years.

Throughout the 2001/2002 academic year Career Services continued to use SES to collect the job and application data. In the summer of 2002 the contracting portion of SES was completed. Career Services did not feel comfortable giving up the old system at that time and continued using their FileMaker Pro database as a shadow system and to export payroll data.

In the summer of 2003 Career Services starting using the full functionality of SES and stopped inputting data into their shadow system. The first payroll was extracted towards the end of August. This timeframe ended up coinciding with the launch of TCNJ's new PeopleSoft Human Resource system, which was supposed to launch originally in March of 2003 but had been delayed. Due to an oversight by a student programmer and miscommunication between other departments involved, over 400 students missed the first payroll of the semester.

This event caused a large change in DADT. The director for Enterprise Applications pulled the responsibility of SES out of DADT and into the hands of full time staff. It was concluded that students should not have the responsibility of full scale enterprise wide applications. Nor should a student have to bear the burden of mistakes that could affect pertinent items such as payroll. DADT agreed with this change as SES had grown to be well outside the boundaries of the team's principal foundation of small departmental applications.

### **Student Employment System's Success**

Overall SES has been a great success for TCNJ. An overwhelming campus wide paper process has been melded into a sleek electronic workflow system. Job postings and student applications can be processed within a day compared to the weeks it might have taken before. The response from the campus at large has been extremely positive.

SES 2002/2003 Academic Year Statistics:

- 288 jobs posted
- 4115 student applications from 2585 individual students
- 2818 total contracts (some students had multiple contracts)

SES 2003 Summer Statistics:

- 81 jobs posted
- 1512 student applications from 416 individual students
- 484 total contracts (some students had multiple contracts)

SES 2003/2004 Academic Year Statistics:

- 527 jobs posted
- 6652 student applications from 4,175 individual students
- 2021 total contracts

### **Pros/Cons of using Student Programmers**

Overall, the use of student employees in creating and developing homegrown applications has been a highly positive experience. Students can bring a refreshing look to a project and often bring a large amount of energy. They can offer a different perspective and change the direction a project is heading.

DADT was able to accomplish much more than any of the professional staff in the Information Technology department at TCNJ had ever thought. The CIO was originally against the idea of the programming team but has come to realize the great benefits that the campus has enjoyed because of the students.

The difficulties with student workers have been with consistency in the quality of their work, getting them to understand the importance of their work, and their lack of communication. Obviously, all of these items vary from student to student.

Keeping the students interested in the work was another issue. Developing small web applications that collect data is not as exciting as some of the research they may do in class or in another internship. Another issue was keeping up with the high level of production of some students. These students worked so fast that it was impossible to keep them busy.

However, the benefits far out way all of these issues. Projects that might have taken a professional staff person a week to do, because of other responsibilities and distractions, might only take a student programmer a day. Many of the projects DADT has received would not have been accomplished at all due to the lack of professional staff and the high workload of current staff. DADT filled a niche on the campus that may have been left empty.

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