Computer Science
MONTANA TECH OF THE UNIVERSITY OF MONTANA

COMPUTER SCIENCE INDUSTRY ADVISORY BOARD MEETING
April 27, 2001

Those present for the Computer Science Industry Advisory board meeting were:

Phil Sherburne	-	Cisco
Tor Gudmendsen	-	TRW
Jim Palakovich	-	Zoot Enterprises
Jason Lund	-	Qwest
Jen McManus	-	EDS
Bill Ivanich	-	EchoStar
Shane Clifford	-	Micron

Keith Olson, Gary Mannix, Russ Lewis, Celia Schahczenski, and Donna Huntoon represented Montana Tech.

Keith Olson started the meeting listing changes made to the CS curricula since the last meeting:

- Splitting the networking course into two courses: a service course and a network theory course targeted for CS students.
- Splitting the introduction to programming course into three courses: one for CS majors, one for business and humanities students and another for engineers. The course for CS majors focuses on object-orientation and moves quickly. The course for business and humanities students covers a visual, drag and drop language, currently Visual Basic, and the course for engineers covers a procedural language, currently C. We found that each of the courses can cover more material with this split.
- Due to the above split we were able to cover more material in the first semester of the introduction to programming course for CS majors. Therefore in the second semester we were able to move from Java into C++.

Future possibilities:

- Drop MIN 1010 (an applications course for engineers) from the software engineering curriculum.
- Add a testing course to the software engineering curriculum.

The computer science department is offering 2 degrees: computer science and software engineering. Keith asked that our guests discuss how they would expect graduates from each of these fields to differ. The general consensus was to gear the CS curriculum towards the nuts and bolts of software – hardware architecture, operating systems, protocols, etc. The SE curriculum would be more focused on writing applications, determining requirements, testing, etc. The SE degree is less technical. For example, the SE graduates would be more concerned with how to use a network than knowing how the network works.

Our guests were asked how we can better prepare students to fill industry needs. We were told that much of the industry code is written in C. Also that both CS and SE graduates are important but CS graduates are needed the most. The new hire should be able do maintenance on a project with several thousand lines of code. All guests agreed that students should have experience putting something small into a very large program. Students need exposure to all kinds of problems. It was suggested that students work on real world class projects. This gives the students experience. One possibility is to have a buggy program and have the students fix the bug.

The point was made that if the students know the basics, they can grow within the company. Our guests concurred that students do need not know everything but they should know the basics well.

We had a round table discussion and each guest was allowed to tell about his company.

Shane – Micron builds interprocess communicating servers. XML, UML design, C++ development and PERL are important. PERL is used because it is quick and easy. They do not do much with JAVA. They do a lot of automation, providing the backbone architecture and development environments.

Bill – EchoStar builds satellite dish networks and provides software for these networks. C, object orientation and imbedded systems are important. They are porting these systems to UNIX. Driver interfaces, operating system and micro-processing classes really helped Bill. He works within a small programming space. New hires need graphical experience. Right now EchoStar is working on a program that will allow users to order pizza or do their banking while watching TV.

Jen – EDS has 130,000 employees worldwide. They do web application development. They are big on JAVA and use XML somewhat. There is a huge turnover in projects. Jen provided a useful chart showing what new hires need. Basically new hires need a solid foundation in CS and the flexibility and ability to learn. New hires need to be able to work in teams. Certification is important and JAVA certification is pushed.

Jason – Qwest does a little bit of everything. Jason's department does web development. Qwest uses HR training tools, JAVA, Oracle, JSP and XML. New hires need to know version control. The Capability Maturity Model is big at Qwest. PERL is going away. It is only used in a few departments.

Jim – Zoot Enterprises works with large banks and lending institutions. Zoot helps these institutions gain access to credit reports. Zoot uses Linux because they have found that it is quick and problems are relatively easy to resolve. Zoot distributes computing at the OS level. C, PERL and the Microsoft SQL server are used. New hires need low level OS programming, web interfacing, Apache, XML, PERL and a small amount of JAVA experience. Analysis skills are even more important than programming. The most important thing at Zoot is attitude.

Tor – TRW has 135,000 employees worldwide. They have been in Helena since 1990 and have 150 employees there. In Helena they work primarily on human services software systems. Oracle development, design and modeling, writing and being able to use documentation are very important. Experience is less important. PERL and JAVA are used to build web-based applications. New hires need to be technically oriented yet must be able to understand people and their needs.

Phil – CISCO has 44,000 employees. There are 200 engineers in Boulder. 70% of the Internet goes over CISCO boxes and CISCO is growing fast. Boulder is strictly an engineering site, providing equipment to businesses. Operating system level programming, C, C++ and PERL are important. New hires need to know real time programming, data structures and how to debug. New hires should also be proficient writers, presenters and should have experience with project management and tracking tools.

Visiting faculty positions were discussed. All agreed that this would be very beneficial for the professors. It was also suggested to have industry people come and talk to the students. A one-credit seminar class could be created for this purpose.

Keith asked if we could add another class, what would it be?

- Compiler class was suggested because it would teach the theory of computation and how to fix and understand a bug in a compiler.
- Modeling class, especially UML, was also suggested. Design patterns are necessary. Much of industry is going to concept of drawing pictures.

Every one agreed that April is a good time to meet because things are pretty slow. The meeting adjourned at 2:15 p.m.
Respectfully submitted,
Donna Huntoon