MARKET ANALYSIS REPORT

Description of Program

The following information is a description of our current program offering, the career/educational pathways our program addresses, and the jobs our graduates can realistically obtain.

Current Program Offering

In Spring 2000 our department name changed from Administrative Management and Business Education to Information Technology and Administrative Management (ITAM) so that we could better serve the needs of our students and their employers. The degree conferred from our department is now a BS in Information Technology and Administrative Management.

Our curriculum was developed using Skills Standards for Information Technology, developed by the Northwest Center for Emerging Technology (NWCET), currently titled National Workforce Center for Emerging Technology, sponsored in part by the National Science Foundation's Advanced Technological Education Program. Curriculum for Skills Standards for Information Technology were developed through nationwide expert panels, in-depth interviews/focus groups/surveys - both regionally and nationally, compilation and analysis of the data/development of the skill standards, and validation of identified skills for all levels of information technology organizations, nationwide and regionally. Participating and contributing to the Skills Standards for Information Technology curriculum were such prestigious organizations as Adobe Systems, Cisco Systems, Inc., Los Alamos National Laboratory, Microsoft Corporation, The Boeing Company, Northwest AIDS Foundation, US West Communications, and Weyerhauser Company, among over 75 other organizations.

The core course requirements in our department are based on the NWCET IT core curriculum: Analytical Skills and Problem Solving; Business Organization and Environment; Coordination and Communication Skills; Core Computer Software and Hardware Skills; and Project and Process Flow Skills.

The specializations are based on three of eight identified NWCET career clusters: Network Design and Administration; Database Development and Administration; and Web Development and Administration. These three career clusters were deemed by our faculty as fitting most closely the focus of our department.

Our focus for the WCIT Curriculum Development project is the Web Development and Administration courses.

Career/Education Pathways

Approximately one-third of all students at CWU are "native" students; that is, students who begin as freshman at CWU rather than transfer in. For these students, our curriculum follows a "traditional" path. Freshman and sophomores spend the majority of their time taking general education courses. Once students declare a major in Information Technology and Administrative Management, they take a common "core" curriculum, listed below.

ACCT 301	Financial Accounting Analysis
ADMG 201	Introduction to Business
ADMG 271	Business Math Applications
ADMG 310	Business Professional Development
ADMG 371	Administrative Management
ADMG 385	Business Communications and Report Writing
ECON 101, 201, or 20	02
IT 204	Word Processing Applications
IT 248	Web Fundamentals
IT 258	Spreadsheet Applications
IT 268	Database Applications
IT 288	Business Presentation Applications
IT/ADMG 490	Internship

While working on the "core" courses, students choose either the Administrative Management Specialization, the Retail Management and Technology Specialization, or the Information Technology Specialization. The Information Technology Specialization has three focuses from which the students can choose: Web Design and Development, Network Design and Administration, and Database Design and Administation.

Following is the curriculum sheet for the Web Design and Development focus:

B.S. in Information Technology with a specialization in Information Technology For students wishing to focus on **Web Design and Development**

Recommended courses in the Information Technology Specialization for students wishing to focus on **Web Design and Development** are in **bold print**. Courses with a preceding asterisk (*) require substitution approval by the chair of the department.

Information Techno	50-53 credits	
Information Technology Specialization		12 credits
IT 228	Introduction to Information Technology (4 cred	its)
IT 361	Hardware Management (4 credits)	

IT 452 Telecom. & Microcomputer Networks (4 credits)

Electives

25-28 credits

Select a <u>minimum</u> of one course from this category:

IT 374	Project Management (4 credits)
IT 462	Admin. Systems Analysis and Design (4 credits)

Select a minimum of one course from this category:

IT 422	Web Site Construction (4 credits)
IT 426	Web Languages (4 credits)
IT 458	Management of Computer Networks (4 credits)

Select a minimum of one course from this category:

ACCT 455	Accounting Information Systems (5 credits)
CS 167	Visual Basic Beginning (4 credits)
CS 367	Visual Basic Advanced (4 credits)
CS 420	Database Systems (4 credits)
PSY 462	Computer Methods for Social Science (4 credits)
IT 359	Advanced Spreadsheet Applications (3 credits)
IT 468	Projects in Database (4 credits)
IT 470	Database and the Web (4 credits)
OMIS 386	Management Information Systems (5 credits)
OMIS 420	Database Systems in Business (4 credits)
SOC 464	Applied Data Analysis (3 credits)

Substitutions into the Electives

*IT 424	Managing a Web Team (4 credits)
*IT 428	Web Applications (4 credits)

Students who complete our "traditional" curriculum should be qualified to enter either a large organization at an entry-level web design position or to enter a small organization and, as a single person, develop and maintain a web site.

Nearly two-thirds of all students at CWU are transfer students. Because the ITAM department has such a unique focus – inclusion of both IT courses and "professional skills" courses – we are currently working with the SBCTC to develop a Bachelor of Applied Science in Information Technology degree, whereby students from technical colleges would take general education courses at the upper-division level and "professional skills" courses through our department to complete their four-year degree.

Thus, the technical colleges would essentially be developing the students' technical expertise, and our department would be developing their "professional skills" expertise. Our program then becomes less of a career pathway and more of an education pathway,

allowing graduates with more technical degrees to learn higher level skills enabling them to advance in their careers.

Job Opportunities

Our students tend to seek out one of two career scenarios: either they move to the "west side" of the state and gain employment in a large organization, or they remain in "central Washington" and gain employment in a small organization.

For both sets of students, our goal is that they can demonstrate the following skills:

- Review information and ask questions of key persons to identify relevant content and preferred presentation
- Communicate technical information with both technical and nontechnical people
- Use appropriate concepts to design and organize web pages
- Validate, refine, and obtain approval from key persons
- Design, build, and test web pages and links
- Update contents and maintain web site

The main difference between our two groups of students will be in the amount of responsibility they will hold within the organization. Those students who work in a large organization as part of a web design team will find their responsibilities and necessary job skills more limited. Those students who often take an administrative support position within a small organization and develop web pages "on the side," will find they are solely responsible for all the above skills.

Previous Workforce Demand Research

In Spring 2001 we began assessing and realigning our curriculum. This assessment and realignment is based on our Advisory Committee recommendations, a Next Step Forum meeting with community colleges that transfer students to our department, and surveys of our department graduates and internship students.

Realignment of our curriculum was also based on a report released in December 2001 by the Northwest Policy Center of the University of Washington, titled Re-inventing Information Technology Education. "Our major conclusion from this project is that employers need IT workers with a combination of skills that no higher education program currently offers:

- Very practical, hands-on skills of the sort taught in 1- and 2-year technical programs,
- A broad range of problem solving, communication, and organizational culture skills with a 4-year university degree, and

• Opportunities for work experience to supplement their classroom education.

Neither community/technical college nor universities in this state are providing this kind of education at present."

Every five years our department conducts an alumni survey to determine job titles, career paths, and salaries of our graduates. Prior to Fall 2002, though, our department degree programs were Administrative Management and Business Education. IT was taught only as a "computer supplement" to our Administrative Management students. Therefore, we lack any longitudinal data on job duties of entry-level IT graduates. Obviously we will begin collecting this data as our students graduate and enter the workforce in IT related careers.

Current Market Research

The following section details the market research conducted for the Market Analysis Deliverable. The first section discusses the information we hoped to gather, the sources we hoped to access, and the sources we were able to access. The second section, organized by interviewee, details our interviews, and the final section discusses the similarities and differences among responses by the interviewees.

Information and Sources

Our goal in this market analysis was to look at the career skills needed for the two distinct groups of job-seeking students we have – those who want to work as part of a web design team in a large organization, and those who want to remain in central Washington and work at a smaller organization.

We hoped to interview experts from both large organizations on the west side and small organizations in central Washington. In the end, we interviewed Michelle Royer, Faculty Resource Center at Bellevue Community College; Jesse Days, Web Administrator at Central Washington University; and Jennifer Fountain, a graduate of our program who developed a web site for a small company in Ellensburg.

Interviews

<u>Ms. Michelle Royer</u>. Ms. Royer was involved in the high tech field for eight years. She helped develop the NWCET Skill Standards, and she is an expert in skills needed for web design in large organizations on the west side of the state.

Ms. Royer felt that students should be aware of all the key activities in the **Perform Content and Technical Analysis** critical work function, but their tasks would be completed as part of a team, rather than a lead person in any of the key activities. Of critical importance are the students' ability to translate technical information to customers in a way that was understandable to non-technical people. Students would need to have the skills to develop mock-ups and prototypes based on technical specifications given to them and to be able to define time needed to complete tasks given to them by the project manager.

In the **Develop Web Applications and/or Sites** critical work function, Ms. Royer felt that developing a site map and application models, producing graphics and layout elements, writing supporting code, and performing unit and integration testing were critical. Other members of the design team would select programming languages, write the content, and develop supporting databases.

With the **Implement Application and/or Site Design** critical work function, students' understanding of the process and key activities are critical, according to Ms. Royer, but students would probably not be participating in the activity. Ms. Royer felt that students beginning their careers in large organizations would be, for the most part, completing tasks in the **Maintain Applications** critical work function. While all the skills are important, Ms. Royer pointed out that documentation is critical, and is often a skill that is lacking from recent college graduates.

The **Managing a Web Environment** critical work function will be handled by web designers/developers with more experience than an entry-level employee (in a large organization). Ms. Royer felt it essential, though, that students understand the skills needed.

Like Managing a Web Environment, **Manage Enterprise-wide Web Activities** critical work function contains skills that students need to understand, but will not be involved in, with the exception of providing quality customer service.

<u>Mr. Jesse Days</u>. Mr. Days is the web developer for Central Washington University. While he does not have any employees working with him, he frequently and consistently used interns from both the Information Technology and Administrative Management Department and the Computer Science Department to help him in web design and maintenance. In addition, as part of the University Relations Office, Mr. Days has available to him editors and writers to help with copy.

During the interview we asked Mr. Days how interns from the ITAM department and CS department differed, and whether our students were lacking essential skills that CS students had. Mr. Days enjoys working with both sets of students, and says he trains each group differently. CS students often have a strong programming background, but according to Mr. Days, lack the ability to "visualize" the end product and often lack the skill to make the web page visually appealing. He works on those visual skills with CS majors. ITAM students, on the other hand, have strong visual skills, but often lack the indepth programming skills. Therefore, Mr. Days concentrates on developing programming skills with them.

Concerning programming skills, Mr. Days felt that students need programming skills in such platforms as Homesafe and Adobe, rather than in "generator" programs like FrontPage and DreamWeaver. He also felt internships were essential in the education process, and mentioned that interns in his office had secured fulltime positions in organizations such as the Sunny Side School District, Microsoft, and Central Washington University.

Concerning the critical work function **Perform Content and Technical Analysis**, Mr. Days felt that gathering data, researching content, and preparing preliminary application were essential skills.

Under the **Develop Web Applications and/or Sites** critical work function, Mr. Days felt entry-level students needed to be able to produce graphics and layout elements and adapt content. Design tools and programming languages would already be selected for them and databases would be developed by the database administrator/developer.

Mr. Days felt that the **Implement Application and/or Site Design** was of very low importance; not skills expected of an entry-level developer.

Mr. Days said that **Maintain Applications** critical work function was of very high importance and particularly stressed updating content, performing application maintenance, and documenting application and/or site changes.

As part of a team, entry-level employees should be able to evaluate and recommend web hardware, software, and third-party solutions in the **Manage Web Environment** critical work function. All other skills in the work function would be performed by others with more experience.

Manage Enterprise-Wide Web Activities critical work function also received a low priority from Mr. Days. He did comment that entry-level employees might be peripherally involved in evaluating web technologies and standards and providing quality customer service.

Mr. Days also commented during the interview that teaching "professional skills" to IT students is essential, especially teaching students to communicate technical information to nontechnical people.

<u>Ms. Jennifer Fountain</u>. Our final interview was with a graduate of our program, Ms. Fountain. Ms. Fountain has an undergraduate degree in Marketing Education and taught high school for several years. She returned to our department in 1992 to complete her Masters in Marketing Education. After graduation she took a temporary position with Central Hand Therapy (physical therapy) as a receptionist as she worked toward a career shift into Students Affairs at the college level. While at Central Hand Therapy, Ms. Fountain developed a web site for the owner of the business. Ms. Fountain, while overeducated for the position, represented what many of our graduates do – take a position with a small company and then use all the skills they learned in our department to perform different functions within the organization. Ms. Fountain used FrontPage to develop the website, and she housed the website on Yahoo.

Ms. Fountain said several skills in the **Perform Content and Technical Analysis** critical work function were critical: gathering data to identify customer requirements, researching content, and preparing preliminary application.

In the **Develop Web Applications and/or Sites** critical work function, she found herself concentrating mainly on a developing site map and application models, producing graphics and layout elements, and creating and adapting content.

She continually tested the web site as she was developing it to make sure it worked and that the graphics loaded in a timely manner, but she was not sure if that met the develop and implement usability testing standard in the **Implement Application and/or Site Design** critical work function. All other key activities in that category received a low priority rating by Ms. Fountain.

Maintain Applications critical work function received a high priority from Ms. Fountain: Update content, perform application maintenance, and recommend application and/or site improvements. She said she did not document the process she used to develop the web site; as she has now left the company, she recognizes how important it is to document!

Manage Web Environment and Manage Enterprise-wide Web Activities received low priorities by Ms. Fountain.

Similarities and Differences

Certainly we found many more similarities than differences among responses from the interviewees. The critical work functions deemed most important by all interviewees were **Perform Content and Technical Analysis, Develop Web Applications and/or Sites,** and **Maintain Applications**. Within those critical work functions, students/entry-level employees need skills in gathering data, researching content, preparing preliminary application maintenance, and documenting application and/or site changes. And while Ms. Royer and Mr. Days talked of the skills in relationship to a small organization, the skills identified by all three interviewees were strikingly similar.

Conclusions and Limitations of Market Analysis

The following sections describe our conclusions inferred from the data we gathered and discuss the limitation of our market analysis.

Conclusions

The focus of our department is to prepare students to gain employment in entry- and midlevel positions. Having all the interviewees focus on the skills needed for entry-level positions in Web Development has been eye-opening. In our current curriculum we have courses in Leadership and Supervision and Managing a Web Team. As we continue with the Gap Analysis we may find those courses less valuable than, say, other courses in Web Languages.

Secondly, documentation of work, gathering data, and researching content were emphasized much more in the interviews than what we emphasize on our curriculum. Finally, producing graphics (using programs such as PhotoShop) is also not emphasized in our curriculum, but was emphasized in the interviews.

Limitations

Because our program is so new and no graduates have been placed from our degree program into the workforce, our research is naturally limited by generalities from our interviewees. As students begin graduating with an Information Technology and Administrative Management degree and securing placement in web design and development positions, we can begin conducting longitudinal studies on what the graduates perceive as necessary entry-level skills and match those against the skill standards and our curriculum.