

INDUSTRIAL EXPERIENCE REPORT FOR BSENG

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Employment Details

Name of Employer:	Digital Resource Services (DRS) at Australian National University (ANU)
Job Title:	Software Developer
Role:	Software Development
Period of Employment:	27 April 2006 - 29 September 2006
Supervisor:	Dr Peter Raftos (02 6125 1065)
Job Description:	Java/XML Software Developer

Work Done

As a software developer with the ANU I designed and implemented the Automated Obsolescence Notification System (AONS) for digital repositories. AONS is a tool for detecting file formats in digital repositories that are in danger of becoming obsolescent. I had previously worked on the same project for three months over the summer of 04/05, this time working on a project to develop a system to summarise and generate useful statistics from DSpace log files.

The AONS Project was originally part of a larger project (PANIC) developed by Jane Hunter of DSTC, which was outsourced for further development. I spent 5 months working on the AONS project at ANU, and although I had no control over the specifications or the scope (to some extent) of the project I did have responsibility for:

- designing, implementing and testing the system primarily on my own;
- management and scheduling of the work to meet time restraints; and
- development of the software.

In reality I was both Project Manager and Software Developer. Understandably, I was apprehensive as to whether I could handle the project on my own. Initially the isolation was frustrating and I soon found that as manager of both the project and my own time, I had to have the self-discipline to get on with the work and not sit around all day doing nothing. This freedom was instrumental in helping me develop my time management skills. It also meant that I was able to develop the software the way I thought best in order to make the most out of the project. I realized that my supervisor had put a great deal of trust in me and that usually a graduate job in industry would never offer the opportunity to independently structure and develop a project to ones own specifications.

Technical

DRS at ANU is oriented towards XML, XSLT and Java. Everything is developed using Cocoon (an XML web framework) and XSLT stylesheets to create pipelines in which the XML data is transformed into the desired format, usually a web application. The applications developed are very much focused on transforming data, mainly for the purposes of putting it into, or getting it out of DSpace (a digital repository application which ANU runs, "Demetrius"). Everything at DRS is about open formats, open standards and interoperability. This is surprising given that DRS deals heavily in digital repositories whose main purpose is the long-term storage and access of digital information. In this field open formats and standards are really the only way to ensure the continued vitality of the stored digital objects.

DSpace is written in Java and is one of the reasons that DRS is a Java shop. Java is also a good object-oriented language well used in industry. Cocoon runs in Tomcat, which is a Java servlet container so the integration between DSpace (which has a comprehensive Java API), Java and XML is good. There are obvious advantages to using open standards (XML) and platform independent languages (Java, XSLT), which was confirmed to us as students such as - porting is trivial (most of the time) and digital objects created with open standards are much more likely to remain usable in the future. An advantage is that ANU is also a very open organisation which allows for greater collaboration and interoperability with other organisations (such as APSR).

Most of the work practices seemed more relaxed than the formal software engineering practices taught at university. For example, less emphasis was placed on formal waterfall style methodologies and more on prototyping and getting things working in reality. I believe that this is a result of the working environment. The ANU working environment in particular is focused on the creation, sharing and dissemination of knowledge and information rather than the exploitation of coveted intellectual property, which seems to be prevalent in the private sector. This relaxes the whole development process, puts much less stress on the people working on the projects and allows for increased creativity.

One of the drawbacks I encountered during my 04/05 work experience at ANU (working on log file statistics) was that sometimes a certain technology wouldn't fit with the solution that you were trying to create. For example, we had a problem summarising log files and generating meaningful statistical reports from them and were using Java and XML to get this done. The logs were converted into XML, summarised using XSLT stylesheets and statistics generated by more stylesheets, which were then graphed using yet more stylesheets. This method was cumbersome because processing large XML files with stylesheets can quickly become a very inefficient process if the stylesheets are not properly optimised. Additionally, we were using an XML database to store the logs resultant summaries, which proved to be rather awkward and slow, as the technology in the field had not progressed enough. This problem could have been solved much more efficiently using a regular relational database and some well placed SQL queries to generate summaries and statistics. In fact I later found out that this was indeed what had been done (more or less) to eventually solve the problem and in much less time too. Still, it was an important learning experience for me as I realised that it's better to fit the problem around the technology (wherever possible) and not the other way around.

Professional

Throughout all of my work experience I have strived to behave professionally, work to the best of my ability and produce the best possible product I could for the time and resources available. That said, it was not always possible to do so as I was studying part time throughout my work experience doing two subjects as well as my full time work responsibilities. It was necessary to attend lectures and labs etc so I was not always able to put in a full days work. Fortunately my supervisor was very supportive of me and allowed me the time I needed to study. Working at a university helped because the importance of education and its balance with work was appreciated. Had I been working and studying elsewhere it would have been much more difficult fitting everything in and I believe my studies would have suffered considerably.

As it was, there were times when I mis-allocated my time and found myself with an assignment to do in a short amount of time; resulting in the temporary suffering of my work duties. Still, a professional would learn from these mistakes and move forward, not dwell on the past. Education and self-improvement is also part of the IEAust code of ethics, so I could not neglect my studies and not suffer in my personal professional development. I believe that I have grown professionally as a result of my work experience at ANU. It has taught me how to handle the responsibility of designing and developing a system and delivering it satisfactorily and on time.

General

Working in any organisation involves workplace politics of some kind, however ANU felt like a much more relaxed environment than I imagined it would be. DRS was like working amongst peers and there was no real sense of hierarchy (in the malicious sense). I felt like I could be friends with my co-workers without covert political games going on (well at least that's what I've been led to believe happens at other workplaces). I think I have my supervisor (I use that term loosely as he really let me supervise myself) to thank for that as I believe he had to put up with quite a bit of crap (or so I hear) and seems to have shielded me from the beaurocracy. I still observed some such politics, which wasn't necessarily malicious but more due to circumstances and lack of resources. For example, one of my colleagues was being perpetually seconded (not quite against his will) by another section of STS (Scholarly Technology Services) to edit and re-structure books being digitised and published rather than work in his true field of expertise.

There was also a social aspect that I had not experienced in my working life so far. We had fairly frequent morning teas where everyone would sit around and have a chat, discussing work or more often than not, something else entirely. I really feel I got to know those I was working with quite well, or those working in my office anyway. They were a great bunch of people and I believe they have significantly contributed to the generally positive outcome I have obtained from my work experience with DRS at ANU.

Conclusion

I believe that I have learned well from my work experience. I have gained many relevant skills from working with XML and XSLT as well as building upon the ones that I had already learned at university (system design, Java, time management). I had never designed and implemented (and completed) a system on this scale by myself before and I found it a very satisfying experience. In fact I think it is far easier building such a system by yourself than with another person because you don't have to spend time trying to communicate your ideas to another person, you just do them. However having said that, having someone to 'bounce' ideas off is

always valuable and therefore teamwork is one thing that I think is very important that I didn't learn from this work experience. To an extent I learned how to work in a team in the 3rd and 4th year Software Engineering projects, which hopefully relates to how it would be in a real-world project.

I'm not sure if my experience is typical of software development in any way because I'm sure I was lucky with my work experience. I've heard horror stories of people being dumped into failing projects and being stuck with bad managers and really not having much fun at all. My experience wasn't like that, in fact the opposite. I worked on a successful project, in a creative environment, with a great bunch of people and was allowed to manage my own time. It has been a very positive and beneficial experience and has served to strengthen my professional skills.

The only down side I can see is moving into the work-force and finding my new job a step backwards in terms of my work environment and personal freedom to work in the way which best suits me and my productivity.