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I have been working at the COL division of Hewlett–Packard, located in Colorado Springs, Colorado, for the last 2 months. We design, manufacture, and support logic analyzers, processor emulators, and other embedded system development tools. This document describes my experiences by including a general description of my tasks and projects, skills I developed, observations regarding the work environment, and the strengths and weaknesses I displayed. Hewlett–Packard is a very large company, but its divisions are locally managed, which helps to maintain a small-company feel.

I work in the marketing section of the logic analysis division. When I first was approached by the marketing division last spring, I was apprehensive about working in marketing because I wanted to do "real engineering." The products we support are very technical. I learned that sales are achieved on technical merit, not glitz and glitter.

I have an very strong background in UNIX programming and networking, along with the ability to quickly pick out the important issues when solving problems. My job tasks consist of two major projects I am working on. I also help resolve problems and answer questions other people in my group have about UNIX and networking.

One of the functions of the marketing department is to provide technical support to Field Engineers who sell and provide direct technical support to the customers. When the dispatcher at this site receives a call, he collects certain data from the FE and enters it into a database. He then assigns the call to a specific engineer at this site, who will research and resolve the issue. There is one application which drives the whole process; it is a database called OASIS. OASIS runs on the HP–UNIX platform, HP–UX, and is an X–Window application.

The original OASIS was developed on the now obsolete HP Series 800 workstation, weak by today's standards, whose X–Window programming library was not compatible with the new HP Series 700 workstations like the ones we use at school.

We had one Series 800 relic whose only purpose was to run the old OASIS code; it had run out of storage, and was not powerful enough to manage the whole database. My job was to *port* OASIS to the new Series 700's. After looking over the original code for OASIS, I decided to re-implement the database application from scratch.

I chose a language suite which I hadn't used before, although I had heard of it. Because of this good choice, I was able to get a prototype running in just a few days. I had the whole thing implemented in about 2 weeks, and then spent another week verifying correct behavior.

The next step was one of the most informative parts of my experience so far: I went around to all the engineers who were going to be using my new version and asked them for feedback. I learned a lot about end-user requirements and preferences, and got different perspectives than those of a systems hacker like myself.

My mentor and I had to draw a line where features were to stop being added. We had to stop what, in software development, is called *creeping featurism*. The old database was a bear to use, and once the users had a taste of the new friendly interface, there were many requests for added features. I was able to add most of them, but we had to draw a line so I could go on to other projects. All considered, it was a success.

My second project involved integrating some of the hardware that our division produces. As background, we produce *processor emulators*, which replace the CPU when debugging new computer systems. These are expensive to develop, because for each different processor type there must be a unique emulator. We also produce Logic Analyzers and Processor Probes. A cheaper solution to the emulation problem is to combine a Logic Analyzer, a Processor Probe, and a workstation on a network. This combination can act almost like a full-fledged emulator, at a much lower cost, and is called *distributed emulation*.

The drawback of distributed emulation is that there are many opportunities for user error while setting up and using the system. My task is to provide setup testing capability from the workstation. The user will be able to run the test software, and it will tell them what is not correctly configured, and suggest ways to solve the problems.

I have quickly achieved local "fame" in my group as the UNIX and programming guru. Almost every day I find someone seeking my help with one of their sticky problems. I am able to resolve their problems, and suggest novel solutions because of the large amount of experience I have in this area.

The work environment at HP is very enjoyable. It is an extension of the "HP Way," whose basic tenet is: people will excel at their work if they are given a pleasurable working environment and jobs they want to do. My experience shows this idea to be correct, and the environment here reflects that philosophy. It is easy to ask people questions, and they are happy to help you. It is casual, and everyone is friendly because they enjoy working here. Part of being a nice place to work is trust, and people here trust you and expect the same. One example is that we don't have set hours; we can work whenever we want within loose limits as long as we get our stuff done, and work roughly 40 hours per week.

The only problem I have had is *not having enough work to do.* I am most productive when I have several problems, maybe parts of one big project, that I can switch between. Working this way allows my brain to get new ideas while I am working on a different problem.

I learned several things about a marketing department in a technical setting. As opposed to a Research and Development setting in which the projects are dictated to the engineer, in marketing there is more freedom to choose what we will work on. For example, my mentor has a set of core responsibilities, but in addition, he also is working on several projects which will enable the whole group to better perform its task.

On a slightly different note, we have more parties than the R&D folks do; these get-togethers help us get to know each other so we can work as a team better. HP values its people, and keeping people happy will keep them productive; these parties help keep us happy. One is reminded of the Dilbert cartoon which shows the marketing division through a golden gate with the sign "Marketing — 2 drink minimum."

I have shown my ability to quickly pick up new ideas, and to quickly understand the essentials about devices like logic analyzers and other logic probing devices. I have also helped my mentor by thinking up novel solutions to some of the problems he is dealing with. This has made our relationship two-way instead of a "master and student" relationship.

The overall experience has been positive. I have found that a technical marketing department isn't "wimpy" as I imagined it to be; we are engineers solving technical problems with customer targets and interoperability between devices. My first project utilized my existing knowledge of UNIX, networking, and other miscellaneous programming to solve a festering problem. It was a complete success. My second project has been more research–oriented, and at this time is coming along reasonably well. I spend part of each day helping others with subjects unfamiliar to them, but known to me.

I enjoy working full–time in a happy environment like this one, with interesting projects and helpful people. The area of Colorado Springs is a nice place to live, and overall, this summer has been a success. This experience has influenced my career plans by opening my eyes to other applications of Electrical Engineering besides strict R&D

lab environments. I have enjoyed working so much that after I graduate, I plan to work somewhere and get my MSEE and PhD while I am working there.