Key Skills and Industry Experience

Science and Internship Subject Final Essay

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1 Introduction

Where do I even want to work? How do I get started? When do I apply? These were the questions that had prompted me to research and gather information regarding my internship placement. After several hours of contemplating and discussion with peers, I arrived at Spatial Analytics at UniMelb's Infrastructure Services where I would be granted an opportunity to intern at. Although I had worked extensively[1] alongside studies, this would be the doorway to my first pathway in Data Science.

2 The Relationship Between Work and Studies

2.1 Finding the Right Workplace

One of the major reasons I was interested in Spatial Analytics was to learn Tableau - a Business Intelligence software. Despite having a long-term goal to learn the fundamentals of Tableau because of the rising demand of experienced graduates, I simply lacked the motivation to do so. As such, the appeal of creating interactive dashboards over generic reports for clients was inviting, and I would be able to master it with ease within the first few days of the internship due to my strong programming background.

The projects I worked on (that have to remain confidential due to a signed contract with the university) throughout the duration of the internship would all be related to the automation of data cleaning and interactive reporting, breaking away from the traditional time consuming methods involving excel, several back and forth emails, and the generic reports done in word.

Since my background was a combination of both statistics and programming, I was able to quickly incorporate the knowledge gained from my studies into numerous projects. Notably the constraint problems[2] from MAST30024[3] and database warehousing[4] from INFO2008[5] had vastly increased the efficiency of automating the data cleaning side of projects. Combined with Tableau and the suggestions

[1] In sectors such as hospitality, administrative, and education to name a few.

[2] Problem solving techniques when given an optimisation problem. An example includes timetabling without any clashes.

[3] Linear Statistical Models

[4] The method of managing a database.

[5] Database Systems

of my supervisor, the originally time consuming projects were greatly improved visually, and completed much more efficiently. Likewise, the suggestions and tips my supervisor had given me would be beneficial to my studies in COMP30027[6] in report writing and data visualizations.

2.2 Mathematics

If a statistician was asked *"does correlation imply causality?"*, they would without fail, firmly answer with a *"no"*. This was the very question I had been asking myself repeatedly throughout my intern when presented with promising data.

Although the projects have to remain confidential, an equivalent scenario would be seeing a positive relationship between the number of pirates, and global warming. If one ignored all sense of background knowledge, they would arrive at the conclusion that the decrease in pirates has *caused* an increase on global warming, hence we would need more pirates in order to combat this. Although the example may have sounded silly and obviously wrong[7], the data I worked with included confounding factors[8] or hidden relationships, and was difficult to test using standard tools such as Excel.

I was glad to see that I could draw my knowledge from both MAST20005[9] and MAST30027 to draw a statistically backed conclusion[10] to the projects. Previously, the theoretical questions and assignments in the maths subjects had me baffled as to their applicability in a workplace, but the internship placement has reinforced the theory I learned from my studies.

2.2.1 Programming

It could be said that my toolbox for programming mainly revolves around Python for both the data processing and data visualization. Yet I found myself combining several languages and software to complete the projects. The generic pipeline would be to clean and process the data in Python, load up the cleaned data into R for statistical analysis, and visualize the findings in an interactive report through Tableau.

In addition to the programming aspects, there was a requirement to communicate with the clients to ensure that the progression was going as scheduled, and the requirements were being fulfilled. It now became apparent as to why we had group projects in COMP30024[11] and COMP30027 - there was a need to communicate effectively on projects with strangers, and write up clean documentation so that a third party could understand it. After the 3 month placement, I found myself automatically writing documentation and notes in case I had to communicate my progress.

The new and versatile approaches I was exposed to will become a useful asset to future career pathways.

[6] Machine Learning
[7] I hope you agree with this statement.
[8] A third variable that may affect your other two variables
[9] Statistics
[10] Such as Hypothesis Testing
[11] Artificial Intelligence

3 Professionalism in the Organisation

3.1 Communicating with Clients

It became clear that the ability to communicate effectively was needed in order to remain on top of the project work. For the first time in my life, I would be introduced to a real professional workplace with scheduled meetings and progress checks. Although the internship was flexible regarding working hours and dress code, it was obvious that client meetings were treated with workplace professionalism.

On the days of the intern with client meetings, I was expected to dress in a suit and speak formally. Even though my supervisor was doing the majority of presenting, I was able to observe the body language and the clarity of his speaking throughout his presentations. These included subtle hand gestures or emphasis on certain words went a long way, and it was visible that the clients were engaged in the presentation. Eventually, I would be given opportunities to do both the talking and presenting, where the final days of the intern resulted in myself actually *running* the meetings. Initially I was quite nervous, but by the end of the placement I was much more confident when it came client interactions.

The final product of my efforts resulted in a growing networking circle, where the clients I had become acquainted with had become connections to other pathways.

3.2 Troublesome Colleagues

From my previous work in other sectors, there has always been at least one colleague that is hard to work with. Spatial Analytics was no exception, and it was apparent that some of the other divisions were troublesome to work with.

A prominent scenario that occurred several times would play out like this - another division from a different academic background would expect a project to be completed, only to be clueless as to what they wanted, or what they were trying to achieve. Since I was an intern, my opinions and advice was ignored even though I was more of the expert related to data analytics. Luckily my supervisor was already experienced in dealing with those divisions and simply told me to drop the projects and move onto the next one.

In contrast, there was a scenario when some colleagues initially did not support the automation of the projects since they were a bit more old-school. After considerable emails and discussions, my supervisor and fellow interns would be able to convince them to adapt to the new technology. Thankfully after some hours of usage of the new system, they appreciated our work and indirectly apologised for the inconveniences caused.

Hopefully, the communicative skills and patience I gained to resolve these scenarios will better equip me for future careers, or even extend to my group projects at university should issues arise.

3.3 Workplace Environment

As explained at the beginning of this section, the workplace was quite flexible in terms of dress code and time. On the other hand, the working environment showed to be a completely different story. Undoubtedly, the workplace ethics Spatial Analytics used was intriguing. It revolved around an Agile methodology,

which aimed to be an improvement of the more traditional Waterfall methodology predominantly used in Software Engineering workplaces.

Rather than letting each staff complete their project and present their results at the end, Agile methodology required all staff to discuss their progress and tasks to complete at the beginning of a work day every few days. This ensured that all staff who were absent (such as part-timers) were kept up to date, and could take over or work on the projects that needed help. After taking part in such a work environment first handed, it became clear as to why other companies or organizations were transitioning towards Agile work environments[12] - you could feel the flow of the work being smooth and informed.

The divide-and-conquer[13] approach meant that all sub-projects could be effectively completed and distributed evenly, and the vast improvements in efficiency compared to my previous workplaces became apparent.

This allowed me to find and develop my organizational skills such as managing project priorities, to remain efficient with project deadlines and workload. Furthermore, it helped me become accustomed to frequent staff meetings, and has become one of the more important soft skills I have gained throughout the internship placement.

3.4 Workplace Culture

As an intern of the new division, it was understandable that we would be positioned at the bottom of the workplace chain-of-command. However, the different backgrounds and knowledge my fellow interns and I brought to the division were treated as valuable opinions. Specifically, we were rewarded for the completion of projects with the freedom to *choose* our next projects - and this ensured that our working standards remained high to keep this benefit.

I was also introduced to workplace meetups, where we would hang out for drinks after work to mingle and talk. This was an interesting first time experience and helped me understand my supervisor and fellow interns at a deeper level.

4 Industry Skills and Experience

4.1 Teamwork

Since Spatial Analytics was a new division, the internship placement I participated meant that I was part of the first intake. By definition, this indicates that our supervisor was also new. As a result, my fellow interns and I were given the freedom to experiment with how the internship would run under the supervision of our supervisor.

Projects could be done collaboratory or completed alone, and there was freedom in choosing which tools or software to use for our approach. Due to this, the importance of teamwork in our division was emphasised.

With the absence of any guideline on the project steps apart from the client expectations and requirements, my fellow interns and I in an overall sense, participated in every project. Particularly, I

[12] Such as the Big 4 companies.

[13] An algorithm method that will break a larger problem into sub-problems to solve it.

would remain in touch with my fellow interns outside of work through social media in case they had questions, helped work on the projects if I was working and was free, and gave advice or solutions to some problems in any stage of the projects. This was also extended the other way if I was stuck on a problem, or had trouble figuring out a solution to the problem.

4.2 Motivation

After the internship placement, I was able to figure out that I enjoyed visualizing the data, but not preprocessing it using ETL[14] techniques. After discussing with other interns outside of Spatial Analytics, I found that they were left to just do ETL on datasets – a boring and frustrating process of cleaning, formatting, and fixing the data before being able to load it up for visualizing. Even worse, they had to hand it off to their Senior Analyst who would do the visualizations and not let the interns touch it.

This made it clear that I was in an ideal position where I had the freedom of approach, and have input to the projects' execution. Having experienced one of the better workplaces as my starting point, I have felt the motivation to remain within a similar sector as my future career pathway i.e: a combination of Education, Government, and Data Science.

5 Self Assessment on Core Skills

From my initial ratings for the self assessment on core skills, I can now say that I am now significantly more confident and organized when it comes to my skill set and core skills.

Most importantly, I have become able to recognise the importance of applying the knowledge gained from studying into the workplace, and vice versa. Combined with the freedom of approach I was given to project execution, I now feel that I am capable of creating innovative solutions to projects through the combination of programming languages, software, mathematics, and the recently gained industry experience.

In addition, my ability to now communicate effectively at a professional level with clients will serve as a valuable asset to my own personal skill set. Future scenarios when working with clients should now feel more familiar, and allow for faster adaptability within the workplace.

6 Conclusion

Over the course of my 3 month internship, I was able to develop and cultivate core communication skills, as well as learning Tableau which is an asset to put on my resume for future careers. I came to recognise that I lacked skills in resolving troublesome scenarios, and was able to equip myself with the procedures required to handle future cases. Although I never expected my theoretical studies to be useful for my internship placement, I was glad to know that they were actually quite practical and very applicable in analytics. The relationship between my work and studies has now become more clear, and as a result, know what I need to focus on with my future subjects. Now backed with real industry experience, I hope

[14] Extract, Transform, Load - a typical pipeline process for data processing.

to draw from my experiences and incorporate them into my studies, just as I have applied my studies into the workplace.