**My IT Profile**

**About Me and Interest in IT**

Hi, my name is Brendan and I’m studying a Bachelor of Information Technology with RMIT, through Open Universities Australia. My passion has always been in helping others, so I chose an initial career path in the medical sector and have been working in this field since graduating with my first degree. While this career has been rewarding and I love being able to help people in this way, I have realised that there are other ways I can contribute to society and help people (perhaps in a less direct fashion) while working in a field that is much more progressive, and that I have found interesting since I was very young.

I’m the type of person you need to get to know, to really know me. I grew up on property about half an hour from town with pretty limited access to technology. This was the driver for my interest in IT, especially in all things telecommunications; I didn’t have access to basic broadband so I wanted to know all about it, to figure out why this was the case. There was no mobile phone service, so I researched mobile frequencies, tower locations and external antennas to see if I could overcome this. Theory started going into play after the switch to digital TV occurred in 2013, and the only digital service we could receive was polarised differently to our council-run analogue TV, and came from further away. Living on property means you don’t call someone to fix things if you can do it yourself – so when analogue was switched off, I installed a new TV antenna and masthead amplifier, positioning and polarising it myself with a compass and map. After that came installation of a yagi mobile phone antenna, an interest in point-to-point farm communications, and the list goes on.

Moving into the ‘big smoke’ and starting a biomedical degree caused this passion to hit the backburner for a while, but it’s back at the forefront now that I have enrolled at RMIT. There is a University much closer to me that offers a very similar course, however my partner will be studying in Melbourne in 2020, so we are moving to Victoria at the end of 2019. As such I decided to study at RMIT, partially because I could get a head start online now, and partially because my research concluded that it offered the best IT course of all Universities in the Melbourne area.

At the beginning of a bachelors’ course, I believe expectations of future learning should be very loose. If you expect to learn only certain things you’ll either find yourself disappointed this did not occur, or homing in only on those things and missing other equally important content along the way. Study plan requirements often mean you study subjects you wouldn’t normally choose, and therefore learn things you would never have learnt if you could pick and choose according to expectations of learning. So while I’m going to be tailoring my studies to networking (how networks work, their setup, maintenance and expansion), I am open to learning anything and everything else along the way.

Cheers,

-Brendan

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**Ideal Job**

My ideal position involves working in a Network Operations Centre as this provides a great mix of fast paced work, problem solving and exposure to different hardware-software mixes.

*Ideal position:* IP NOC Engineer

*Seek job link:* (<https://bit.ly/2W6X0CY>)

This Network Operations Centre (NOC) Engineer role involves network monitoring and traffic management, fault rectification and network provisioning throughout the entire TPG IP network. The inherent requirement of this position is an ability to problem solve in a fast-paced environment, work to timeframes and liaise with vendors and other NOC staff; tasks which I find exciting. Tasks include responding to network faults and trouble tickets, assisting in planned outages and network upgrades, using network monitoring tools to maintain oversight of various elements of the TPG IP network, and working with hardware and technology vendors in relation to network faults, performance and monitoring.

As with all job advertisements, this position requires that successful applicants demonstrate qualifications, skills and experience prior to employment. At this point in my study it’s understandable that I am lacking in the qualifications and experience inherent to this position, however breaking down the requirements of the position allows for an understanding of which requirements I need to work towards meeting, which I can already demonstrate, and how I will work towards meeting these requirements.

***Qualifications:***

* Tertiary-level study of IT, Telecommunications or an Engineering degree related to IT/Telecommunications
* Cisco Systems certification: CCNA (Cisco Certified Network Associate), and CCNP (Cisco Certified Network Professional)

I currently hold none of the required qualifications, however I have planned my degree around the attainment of these. Completion of my Bachelor of Information Technology with a minor in Cisco Systems (comprising of Networking 1 and 2, and Advanced Networking 1 and 2) will fulfil both the tertiary study requirement and the requirement for CCNA and CCNP certification, which I will attain through the Cisco Systems minor.

***Skills:***

* Ability to function both in a team and autonomously, multitask and work under pressure
  + Strong organisational, analytical and problem solving skills, and the development of strong interpersonal relationships are inherent to the requirement of these abilities, and the position itself.
* Excellent written and verbal communication skills
* Ability to conceptualise systems comprised of people, processes and technologies
* Thoroughness and attention to detail

Previous study and employment has helped me to fulfil many of these skills already, and future study through the Bachelor of IT will further develop these skills. Thoroughness and attention to detail, as well as excellent written and verbal communication skills were paramount in my previous position as a lack of these skills could jeopardise patient safety. Similarly, development of strong interpersonal relationships came almost automatically when working with teams of medical professionals. Organisational, analytical and problem solving skills were introduced to me during my first University degree, albeit tailored to the medical field, and I anticipate that the Bachelor of IT will help me to focus these towards the requirements of this field. Likewise, I anticipate that my current understanding of IT systems will be bolstered by my study, which will allow me to better conceptualise systems comprised of people, processes and technologies.

***Experience:***

* Prior experience in a telco environment with exposure to network management, equipment configuration and fault resolution
  + Which in turn aids in gathering of general IP knowledge, including of routers, switches, networks and various IP protocols, and an understanding of various VPN technologies.
* Ability to use Visio and the Microsoft Office suite

Experience requirements will always be the crux of a job application. While I have gained experience with the Microsoft Office suite (including Visio), I currently have no experience in a telco environment. The best place to start would be a position in first-tier support, which requires a fraction of the knowledge and experience outlined in this position. From here, I would gain proficiency in fault resolution, and at least basic experience in network management and configuration, and would be able to more effectively “slip in” to the advertised role.

***The Plan:***

It’s important to note that steps 1 to 3 can (and ideally will) be actioned simultaneously.

**Personal Profile**

*Myers-Briggs Type Indicator Test:* ISFJ-T (Defender)

*Learning Style Test:* Equal parts visual and read/write

*Big Five Personality Test:* Conscientious and Agreeable

Interestingly, the results of the above tests are not mutually exclusive. The Myers-Briggs test defines my personality type as “Defender” which subscribes well to the “conscientious” and “agreeable” traits of the Big Five Personality test. The “Defender” type is an eclectic mix of sensitivity and conservativeness, analytical skills and dedication.

While initially dismissive of the value of these tools, I believe they have correctly defined myself as a student, team member and colleague. As described by these tests, I am an organised and determined person and prefer to cooperate with others rather than compete, as this tactic helps to avoid conflict which in turn halts progress. I prefer to break apart tasks into components for completion, use these to set goals at the beginning of a project, and work towards their completion systematically and on-time. This also allows me to better understand the requirements of the task at hand as it appeals to my visual/read/write learning style. Having an inherent sensitivity to the requirements of others during project work helps to prevent conflict, as you can identify issues early, work with (or around) them, and complete the task at hand. This dedication to projects and desire to complete tasks to the best of my ability is the basic definition of conscientious, but does however mean I have a hard time saying no to requests for help from team members, which can lead to overburdening at times.

My approach to teamwork is influenced by my desire to break down tasks into pieces and set goals for completion. For example, splitting reports into paragraphs, assigning to team members, and having drafts ready for swapping at set times. I am most comfortable in a team that can identify ‘micro-goals’ for each team member and work efficiently towards their completion on a set timeline as I can be assured that the project will be completed on time. As such, in teams that don’t subscribe to this method of planning or where team members don’t all complete goals on time, I begin to doubt whether the project will finish on time, or to the quality I anticipated. In the past when this has occurred, I’ve undertaken substantial editing myself to align all ‘micro-goals’ to one standard.

When forming teams, I look for like-minded individuals who are open to this method of working towards ‘micro-goals’. I don’t however look for people exactly the same as me, as multiple similar personalities tend to produce conflict in group work, which as previously mentioned I prefer to avoid. When forming groups for the first time it’s difficult to assess how group members will function over time, so I would be dishonest in guaranteeing the previously mentioned requirement for editing does not occur in future team environments, however I have found that closely monitoring the progress of each team member and providing help and feedback to them (which in turns lends itself to reciprocation) throughout the course of the project better helps each individual, including myself, to achieve their set goals. There is a fine line between this and micro-managing, but in terms of reaching goals it’s a line worth walking.

**Project idea: Automating the Clinical Coding System**

Public hospitals in Queensland and most other Australian states receive funding from Medicare and other government bodies on a per-patient-per-procedure basis (QLD Health 2018). For funding to be allocated correctly to each hospital, the procedures undertaken on a per-patient basis must be recorded and remitted to Medicare or the relevant funding body in a timely fashion. The current procedure for recording and remitting this information, called clinical coding, is extremely manual and time-consuming. This task involves an administrative worker reviewing patient charts and practitioner/nurse notes to determine what the medical condition was, which procedures were performed, and what materials were used in the process. Each condition and procedure is then assigned a code based on the Australian clinical coding standard ICD-10-AM (IHPA 2019); for example, P59.9 *Jaundice in newborn*. At times the condition can be up to interpretation, due to complexity or inability to decipher clinician handwriting.

Where small hospitals may be able to keep up with procedures using this manual method, large hospitals require a clinical coding team to process the many procedures performed daily. This project proposes an automated system for clinical coding, whereby clinicians enter procedure details directly into a patient’s electronic chart (where in practice by the hospital) or into a stand-alone application, either of which will automatically code said procedure and produce a summary of codes ready for remittal to Medicare. This system will reduce time spent reviewing patient charts and prevent miscoding due to a clinical coders’ inability to interpret the procedure from practitioner notes, as clinicians will be required to directly enter this information.

***The Project***

As many hospitals still utilise paper-based patient charts, this project will focus on the implementation of a stand-alone application designed to run on a tablet computer, supplementary to the paper charts. To achieve this, an iOS or Android application (app) will be developed for use on whichever mobile devices are employed by each Hospital and Health District (HHD), which will query clinicians for the following information, at minimum, as required by relevant data collection standards (QLD Health 2019):

* Treating physician (and unique identifier such as password)
* Minimum Patient Information (UR/Medicare number, DOB, First and Last Name)
* Date and time of event/diagnosis/procedure
* Diagnosis 1 (2, 3, 4 as required)
* Procedure 1 (2, 3, 4 as required)
* Additional materials used
* Patient status (committed (and expected/actual duration), discharged, deceased)
* Additional notes for clinical coding team

This app will be lightweight with a minimalistic User Interface (UI) to allow fast identification of data required, and practitioners will be queried for data in a stepwise fashion:

**Maybe use example UI**

The practitioner will be required to submit the data, after which point data entry will close and the system will return to the initial ‘treating physician identification’ query. The app will organise this data per field, initially identifying the patient from hospital records and assigning patient details, practitioner name, and date/time to a temporary working file on the device. Key words and phrases from the diagnosis, procedure and additional materials fields will then be compared to a built-in table of ICD-10-AM codes. Where matching codes are found, these will be added to the working file. The file will be summarised with the patient status. Additional notes will be transcribed directly to the end of the file, alongside a direct copy of the practitioner notes for the diagnosis, procedure and materials fields, which will be included for verification and audit purposes, with any unresolved words or phrases highlighted for review by the clinical coding team.

A possible example of the data generated is included below:

Table 1: Example data from practitioner review of patient John Citizen, unresolved phrases highlighted in yellow for review by clinical coding team.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| UR 123 45 67 890 / John Citizen / DOB 06 AUG 1976 | | | | | |
| Dr Anthony Citizen MBBS FACS FRACS | | | | | |
| Date of Procedure 01 JUL 2019 | | | Time of Procedure: 1537 | | |
| Diagnosis | Procedure | Additional Materials | | Patient Status | Additional Notes |
| *Code A* | *Code 1, 2, 3* | *Code 22* | | Discharged | isolated resection caudate lobe |
| *Code B* | *Code 1, 5, 6* | *-* | |
| *Code C* | *Code 2, 3, 4* | *Code 76* | |
| **Physician Data:**  Lorem ipsum dolor sit amet, consectetur adipiscing elit. | **Physician Data:**  Vestibulum rutrum tincidunt malesuada.  Aenean eros ex, euismod non nibh ut, lobortis lacinia lorem. | **Physician Data:**  Vestibulum erat ex, cursus ac tincidunt vel, lacinia nec ante. Nulla facilisi. Sed congue sed elit non pretium. | |

This data will then be remitted to an internally hosted clinical coding database via the Hospital’s wireless LAN, for review by the clinical coding team.

*Pre-implementation configuration*

The query fields will be configurable by each hospital’s Information Technology department based on the requirements of their HHD. The location of a locally-hosted storage database will also be assigned during initial configuration.

*Further research required*

The app must adhere to relevant hospital, state and federal privacy policies which will require further investigation. At a minimum, this app will not require internet access and will transmit data only via the hospital’s intranet to a locally hosted database. Databases currently in use for storing manually coded data must also be investigated to ensure this app produces compatible data and is able to write to said databases.

As with all new procedures, beta testing of an initial prototype will be required prior to development of the final model. Personal experience has identified a general distaste towards technology in many practicing physicians, so continuity of this project post beta testing has been considered: if beta testing resolves that uptake and use by clinicians is unsatisfactory, this program could be used by clinical coders to transcribe practitioner notes directly into the program, which will assign relevant codes. This ensures efficiencies can still be found with the use of this program regardless of end-user, as clinical coders would not be required to remember or look up ICD-10-AM codes unless they cannot be resolved by the program.

***Equipment and Skills Required for Project Implementation***

This project will require app development software and skills in application programming and mobile app development. There are many app development tools available, such as the free and open-source MIT App Inventor, or paid cloud-based applications such as Shoutem and GoodBarber. Further research is required into the features and limitations of each tool to discern which is most appropriate for this project. For example, MIT App Inventor is yet to release support for iOS apps (Patton 2019), and at this stage confirmation of the mobile platform in use in a hospital setting has not been obtained. As most app development tools include mobile device emulators, physical hardware is not required for this project, however as no specialised hardware is required, sourcing mobile devices for beta testing would not be difficult.

While the above app development tools boast no requirement for related skills, a basic understanding of databases, app development and mobile app programming would be beneficial in production of the app, and aid debugging. These basic skills can be acquired through a multitude of online tutorials and reference materials, and verbosely through RMIT’s Bachelor of Information Technology, with courses such as Database Applications, Mobile Application Development and iPhone Software Engineering.

***Conclusion***

If successfully integrated into a hospital environment, this project will increase the efficiency of clinical coding by reducing time spent reviewing patient charts and preventing miscoding. This may result in timelier remittal of funding and a reduction in staffing requirements for larger hospitals, however large cost savings from complete workforce reduction would not be possible with this project as manual verification of data is currently required. Although ideally implemented at point-of-care for use by practitioners, efficiencies in data entry could still be seen if this app is used by clinical coding staff, who would not be required to remember or look up ICD-10-AM codes unless they cannot be resolved by the program.

***References***

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