INFO1111: Computing 1A Professionalism

Semester 1 2021

Project 2B

Group Number: 3

	Full Name	Student ID
1	Qiyuan Sun	500709005
2	Yuren Long	500179312
3	Helong Wei	510155494
4	Taoyi Xu	510030629

1 Introdcution

"Computer Science is no more about computers than astronomy is about telescopes."— (Edsger W. Dijkstra, 1993)

It is important for every student studying anything to not only build depth of knowledge with academic achievements, but also to widen scope into other areas that compliments their main direction of study. Whether it is through the lens of applications and implementations of their theories in other areas, through gaining professional knowledge that creates a comparative advantage relative to other graduates, or even through contrasting and reflecting the style of thinking and improve personally, studying in other electives with area outside of the focused major can be very beneficial.

This report is made by four students in university of Sydney each assigned a computing major and tasked to recommend two electives from outside of computing. The contents contains:

1. a table of each team member's assigned major

2. each recommendations with details about area these electives are from, what the electives are, how it relates to the computing major, how it might be beneficial professionally, and the opportunities resulted from it. Here is a brief overlook of the majors and electives:

   - Major of Information System complemented by BUSS1000: future of business and BUSS1020: quantitative business analysis.
   - Major of Computer Science complemented by BADP1001: Empirical Thinking and BADP2001: Algorithmic Architecture.
   - Major of Data Science complemented by CMPN1013: Creative Music Technology 3 and CMPN1014: Sound Recording Fundamentals.
   - Major of Software Development complemented by ENGG111: Integrated Engineering 1 and DATA1002: Informatics: Data and Computation.

3. The contributions for this project including the experiences of cooperation, reflection of the work, and subsequent improvements of collaboration skills.

This report is done using git (https://github.com/PlayerWhoever/re14assignment2b.git) to collabrate our work that is constructed through latex.

As mentioned before, the purpose the this report is to recommend different electives to a computing majoring student in order to assist in the professional and academic careers. The outcome, in addition to the purpose, has also improve each contributors' git and latex skills, cooperation skills, professional representation skills, research skills, and advanced comprehension beyond computing. To that end, each team member found satisfaction, gained knowledge, and developed capabilities to perform in the future.

2 Major Allocation

	Name	Major
1	Qiyuan Sun	Information Systems
2	Yuren Long	Software Development
3	Helong Wei	Data Science
4	Taoyi Xu	Computer Science

3 Recommendations

3.1 Computer Science

I will choose BADP1001 and BADP2001 as my elective courses and I will elaborate on the reasons why I chose them, and explain the source and specific content of these two elective courses. In addition, this report will also explain how these two elective courses help the major of computer science, what kind of help they have in my career, and whether I will have more opportunities in the future after choosing these two elective courses.

3.1.1 area these electives are from

According to The University of Sydney (2021), the two elective courses BADP1001 and BADP2001 are from the Architecture and Interaction Design field of the University of Sydney. And BADP1001 is the course learned in the second semester of the first year of Bachelor of Architecture and Environments, and BADP2001 is the course learned in the second semester of the second year of this major. In addition, the credits for both courses are 6 points.

3.1.2 the electives are

Regarding the specific content of these two courses, according to The University of Sydney (2021), first of all, the overall content of BADP1001 is to explain the way of working in the built environment based on measurement, analysis and modeling. In addition, this course also explained the concept of quantitative skills to students, and explained how to convey the characteristics of buildings and the feelings of people living in these buildings by measuring the ability of several aspects of buildings and the use of some mathematics. Moreover, this course also explores subjective and objective building data and deviations, and analyzes different types of data, visual representation and mathematical modeling. Secondly, about the course of BADP2001, according to The University of Sydney (2021), its content is a general introduction to the basic skills and concepts of algorithm architecture. In addition, this course uses a series of parametric exercises to explain why modeling is understood as architectural design and the conversion of data into specific information for design analysis. Furthermore, students will also learn a variety of calculation design methods to deepen their understanding of architectural calculation principles.

3.1.3 knowledge and capabilities will be developed by undertaking these electives

Regarding the professional knowledge and abilities that these two courses will allow students to develop, first of all, for the BADP1001 course, according to The University of Sydney (2021), it will guide students how to use instruments to measure the space of buildings and many other characteristics of the built environment, and then Use these data to evaluate the relationship between the characteristics of these buildings and other types of built environment observations and the subjective feelings of end users. Moreover, this course will also develop students' understanding of how to identify the limitations and concepts related to different types of data, and specifically clarify their indispensability in the built environment, and effectively communicate the quantification of the built environment in written form And performance, as well as the ability for students to learn how to critically evaluate the empirical research related to the design and operation of the built environment. Furthermore, it also teaches students how to use quantitative analysis to understand the relationship between the dimensions of the built environment and use these relationships to improve the experience and feelings of the occupants. Next is the course BADP2001, which will develop students' ability to determine architectural design logic and express it through parametric modeling techniques, and develop models with different parameters to simulate the changes and relationships between different design variables. Moreover, according to The University of Sydney (2021), this course will allow students to learn how to effectively use quantitative data in parametric design to complete design analysis and data conversion, and use parametric visualization strategies to algorithmically improve design ideas and solve design problems.

3.1.4 how these electives might complement the knowledge and capabilities developed as part of the relevant major

Regarding how these two courses can be used as a supplement to enhance the professional knowledge and ability of computer science, first of all, according to Allen Tucker (n.d.), computer science is a study on computers and computing and their theoretical and practical applications. Computer science encompasses the principles of mathematics, engineering, and logic. These include algorithmic formulas, software and hardware development, and artificial intelligence. And apply these to a large number of computer functions. For the course BADP1001, the content learned in this course can effectively help the major of computer science. According to Eike Send (2005), the main reason is that modern science includes theory, construction and empiricism to varying degrees, which of course also includes computer science. And this course can effectively provide critical thinking to assess the ability of empirical research. I think this ability can help students understand the knowledge of computer science. For example, they can use this kind of critical thinking when they are programming to better improve their own code. For BADP2001, architectural algorithm design is a study that combines computational science with architecture, urban planning and engineering, and computer science is most obviously used to develop CAD and BIM programs, which allows architects to use these programs before building construction Digitize it, model and graph it, and this expertise and capabilities are all related to the algorithm architecture. Moreover, this course can also provide the ability to recognize the basic applications of architectural design and express them through modeling techniques. For example, in two seaside skyscrapers in the UK, these buildings were designed using an algorithm that generates the shape of high-rise buildings so that sunlight reflects off the glass walls

and reduces the shadows of other buildings. The beach is kept in the sun instead of being obscured by the shadow of the building. In addition, algorithms are universal, they can still rely on the same features that exist, which can also help students understand the algorithm architecture in computer science.

3.1.5 if the knowledge and capabilities developed by undertaking these electives will assist in your professional career

Regarding the professional knowledge and abilities of these two courses to help me in my future career, for BADP1001, I think this course can help me better research and interpret information. Because empirical analysis is an indispensable part of scientific methods, according to TechTarget Contributor (2017), it is a common method to study information through the quantitative observation of empirical evidence to obtain possible answers. In addition, in the IT field, empirical thinking exists in market research, software development, data analysis, and project management. In machine learning, empirical data analysis can be used as a data-driven method, which is different from other probability-driven models. Not affected by potentially restrictive initial assumptions. Next, for the course of BADP2001, algorithm design allows the modeling of highly complex geometric shapes, which will be very helpful for me to combine computer science and architectural science in the future. And the algorithm design requires a parametric modeling concept, which means that the design can be manipulated through variable parameters, which allows me to explore a wider range of possibilities easily and quickly in my future career.

3.1.6 if there are any opportunities resulting from undertaking these electives

Regarding whether I have more opportunities in the future, after choosing these two courses, I think these two courses can help me refine my future career path. I can combine the computer major with the architectural major to develop into a professional knowledge and ability that understands both computer and architecture. As mentioned above, become a professional computer architect who can use computers to model and draw buildings. At the same time, some of the direct knowledge of these two majors actually has the same characteristics, which can better help me to have a better understanding than normal students when studying these two majors separately.

3.2 Data Science

I am a student majoring in data science. My elective course field is music. At the same time, the two elective courses I chose are CMPN1013 Creative Music Technology 3 and CMPN1014 Sound Recording Fundamentals. I will elaborate on them below.

3.2.1 the electives and the area they are from

First of all, there are three reasons why I choose music as an elective field of data science: First, music has a lot of data, such as chords, musical styles, and popular tastes. We can collect data from major music platforms. Compared with other fields, its data has the advantages of easy collection, huge database, and fast enough data update. Second, the data of music has a clear direction, it can represent the aesthetic habits of the current public, and data science for music can bring the role of a weather vane to the entire industry, which is very meaningful. Third, the combination of music and data science is actually a fringe industry. Just as many people in this project will not choose the combination of music and data science, the combination of music and data science will not be the first choice of most people in real life. For this reason, such an industry has low competition, high demand, and high returns.

3.2.2 knowledge and capabilities will be developed by undertaking these electives

Then I want to talk about why I chose CMPN1013 Creative Music Technology 3 and CMPN1014 Sound Recording Fundamentals as two elective courses. The combination of music and data science can help our two major industries: music composition and audio synthesis. We use data to investigate the music tastes of the public, and study the writing of different styles of chords, and finally compose and use audio synthesis to complete a song. Therefore, the knowledge and ability we need for these two aspects is the knowledge of music creation and the basic ability of recording, and these two elective courses can help us very well.

3.2.3 how these electives might complement the knowledge and capabilities developed as part of the relevant major

So how will these two elective courses help our major in data science? I think there are two aspects: First, we often need to understand the market trend before creating music, and we need to process the data provided by the music platform. Here we can use the knowledge of data science to help us determine the style of the song. Second, when we create songs, we need inspiration. The automatic music generation system developed by the expertise of musicians and computer experts can be directly written in computer primary and high-level programming languages, and through special digital audio and MIDI The communication interface is used for logical, random and artificial intelligence control of the connected digital sound source system and electronic musical instruments. Choose a predetermined mathematical model, and determine some variable parameters to deform, change, reproduce, and automatically generate works similar to a certain musician's style or a certain region, ethnic style, or works that are simply unimaginable. The source program written by it is equivalent to the score of a traditional composer, and the automatic generation is equivalent to the performance of a performer. The composer uses an expert system or an intelligent arrangement system to give the theme or the main melody, let the computer perform the orchestration of the basic part of the band, quickly complete the automatic generation, mode linking and triggering the sound source and other processes, and finally complete the production of the entire music to get twice the result with half the effort.

3.2.4 if the knowledge and capabilities developed by undertaking these electives will assist in your professional career

As I said above, when we have the ability to combine music creation and data science, the knowledge and capabilities we acquire can create business value for us. For example, we can predict the trend of music trends and provide this information to some platforms. Such as spotify, tiktok, or help yourself to compose. In addition, we can make our own intelligent composition system and put this kind of artificial intelligence composition system into commercial use. Besides, through the processing and application of these music data, we have exercised our mastery and application ability of data science knowledge, and accumulated experience for us. Even if we did not engage in music-related work in the end, we also had many important experiences. Finally, these supplementary knowledge and abilities allow us to have many choices in the career direction, and we can choose to become a big data engineer. You can also choose to conduct research on sound signal processing, such as sound, speech, and brain waves. The research direction of sound is the separation and synthesis of music signals. The research direction of speech is speech signal recognition, subjective and objective evaluation. The research direction of brain waves is to convert brain wave signals with voice signals through wires, mainly for the disabled. We even become professional composers. Of course, only relying on these two elective courses is far from enough. In order to achieve a professional level, we still need to learn more knowledge of music theory and sound processing, but these two elective courses are the most representative.

3.2.5 if there are any opportunities resulting from undertaking these electives

Finally, I want to talk about whether the elective courses can provide us with corresponding opportunities. As I said earlier, the combination of music and data science is actually a fringe industry, because this is a qualitative and quantitative study of art, a direction that is more difficult and has fewer employees. But because of this, it has the advantages of low competition, high demand, and high returns. As far as I know, the functions of music software, such as listening to songs and recognizing songs, and recommending songs through the songs you have listened to recently, are actually good examples of the combination of data

science and music. You can classify music based on music theory knowledge and use computer skills to match the user's playlist with the songs in the music library, so as to be close to the user's preferences. Or you want to write an intelligent composition system by yourself with knowledge of basic code, machine learning, pattern recognition, data mining, etc. In fact, we can make these by ourselves, and we can even find some professional music students and even teachers to cooperate. Rather than expect others to provide opportunities, it is better to seize for yourself.

3.3 Information Systems

It is no denying that any academic subject cooperates two necessary stages, the theory and the application. This is especially true for the computing major of information system. I have chosen two electives that I would suggest a information system major student should study on: BUSS1000:future of business and BUSS1020: quantitative business analysis.

3.3.1 area these electives are from

And one of the best fit area for the application of information system is the area of business and commerce. As Walter Baets(1992) stated that

> "It is generally accepted that one of the key factors for successful IS planning and implementation is the close linkage of the IS strategy with business strategy."

As commerce can be defined as exchange of goods, services, or something of value, between entities. Which such entity can be recognized as a business which is responsible for the supply of such valuables and manage the exchanges. To which involves heavily around producing, exchanging, storing, representing and analyzing of the information.

3.3.2 the electives are

University of Sydney unit of study outlined the elective BUSS1000: Future of Business

> "This unit shows how to interpret data involving uncertainty and variability; how to model and analyse the relationships within business data; and how to make correct inferences from the data (and recognise incorrect inferences)."

The elective discuss the general idea of not only how to predict the future of a business with analyzing pass information, but also focuses on how to plan the future for a scenario business and in turns helps students to development themselves just like the business entities they studied on. University of Sydney unit of study outlined the elective BUSS1020: Quantitative business analysis as

> "unit is designed to provide commencing undergraduate students with insights into the study and the practice of business."

That is to say it is a elective studying about how to manipulate quantities business information, store and apply them in a systematic way that is not only universally recognized but also efficient as many of it has been tested on uncountable real life cases.

3.3.3 knowledge and capabilities will be developed by undertaking these electives

As university of Sydney unit of study outline stated many learning outcomes:

> "LO1. demonstrate an understanding of theory and conceptual frameworks that are relevant to businesses operating in diverse sectors LO2. explain and critically assess the challenges and opportunities facing businesses in a variety of key sectors within the global economy LO3. apply conceptual frameworks to different business problems in order to derive insights about business performance and opportunities for strategic change" and etc

- That is to say, BUSS1000 offers skills such as frameworks to apply information and analysis it with efficiency;

- planning skills that is specially important where there is lots and complicated information;

- knowledge on the stages through product cycles and identify key stakeholders;

- and capability to co-work within a cooperation with the business's point of view.

"Also according to university of Sydney unit of study outline, Buss1020 : Quantitative Business Analysis provide students with the ability that "is important in all business disciplines since all disciplines deal with increasing amounts of data, and there are increasing expectations of quantitative skills." Which in turns will builds a student's foundation for processing large amount of data.

- That is to say the course can develop the student with a sense of standards in collection of data so that the information can be recognized and stored not just easily by the collector but also his coworkers;

- a sense of representing complex and quantitative information efficiently that is able to not only be easily analysis individually, but also be easily understood by the consumer of the information(such as investors with financial reports);

- and a sense to develop quantitative analysis models that can be beneficial into other models where students can build a custom information system off of.

3.3.4 how these electives might complement the knowledge and capabilities developed as part of the relevant major

In the paper A business and ICT architecture for a logistics city, K.T.K.Toh, P.Nagel, and R.Oakden(2009)

> "has outlined the national logistics city project and presented the logistics information ecosystem solution that is just one of the enablers of the concept. The logistics EA is a key component of this solution that bridges the business architecture and the IT architecture."

Learning about business is very useful in vases variety of ways, since most students will eventually use their intellectual knowledge and capabilities developed through out their life to be earning money. Therefore having a whole picture of how their work would produce gross value is not only important as a direction during planning of the work, but also as a safety assurance to make sure that one can understand their work's true value.

To that end, business and commerce is especially important for a information system majoring students. Firstly, they need to understand the type and the purpose of the information, where business and commerce excels at in the application stage. Secondly, they need to identify how to process the information and fit then into the right model, which buss1000 emphasize. Thirdly, the model must be developed in the most efficient way which is covered in bus1020. Fourthly the ability to develop a system out of the information given can also be stimulated as both the electives builds on a structural thinking. And lastly, both of the electives have strong emphasize on analysis which is the ultimate process for a information, this also work excellent in reviewing the system.

3.3.5 if the knowledge and capabilities developed by undertaking these electives will assist in your professional career

According to A. Levas; P. Jain; S. Boyd; W.A. Tulskie (1995)

> "Modeling and simulation are important technologies that can be applied to business process reengineering (BPR). Dynamic process models afford the analysis of alternative process scenarios through simulation by providing quantitative process metrics"

Studying in BUSS1000 would help tremendous with a professional career not only in IT, but also any firms that requires an IT person. As the student not only improve their range of skill sets which mostly focused on application of the theories, an information system major graduate can also find more deeps in their professional skills as there is more dimension to their scope for the information, and a clearer picture to identify and categorize information in the professional skim, which in turns improves their architectural skills when building a system of information.

Buss1020 will give one graduate more practice of how their theories can be applied before going into their professional careers, as many of information system graduates might be allocated with systematically storing cooperate information and consumer feedbacks which will be processed and analysis latter. Having experience on working with business models and incorporating it with advanced computing is very advantageous.

3.3.6 if there are any opportunities resulting from undertaking these electives

It has been common cooperate practice, since almost 30 years ago, that raw business quantitative information should be processed by computers into useful information. Therefore it is common that one business should have a information technology staff and that staff is very advantageous if one have a background or at least some experience business. So one can actually understand the purpose and application of the graph one produced, and thus perform better. This also works in a technology focused firm, the information system majored employee would have an idea of what kind of information he should communicate with the financial department.

The biggest opportunity of understanding business besides majoring in information technology is, however, to start your own business. IT is one of the best industries to start off a business with nothing but an innovating app or algorithm, due to it having very low entry cost to have your program published and start making profits. Therefore there will be a relatively higher possibility that one information system majored graduate would choose to be a entrepreneur, and having basic knowledge of business through BUSS1000 and having capability on application from raw prototype of a program into profitable commercial applications through BUSS1020 is a massive comparative advantage as one might just beat fellow graduates with the same idea to market.

3.3.7 In conclusion

I consider that studying in BUSS1000: future of business and BUSS1020: quantitative business analysis is best suited for a information system student as the two electives gives promising opportunities, helps to build wider scope in turns of the range of one's skill sets, and further develops on depths in professional skills as the business style of thinking is very much reflecting where one can explore their weakness better and make use of their comparative advantages not just in their professional career, but also in their academic advancements.

3.4 Software Development

The field I chose for this research is engineering, and my major is software development. I will introduce in detail the field, content, knowledge and capabilities, relation to the major and opportunities. By considering factors such as the content of the elective courses and the help for students' future careers, the elective courses I recommend for students in this field are ENGG1111 and DATA1002. The specific reasons are as follows.

3.4.1 area these electives are from

Engineering: The purpose of this area of Engineering is to process natural resources into something useful for mankind. This concept has appeared a few centuries ago, and the emergence of engineering talents has greatly increased productivity and efficiency.In the continuous development, engineering has derived many branches such as Chemical Engineering., Civil Engineering, and Electrical Engineering, which greatly enriched the research content and research direction. According to Ralph J. Smith (1999), engineering requires a lot of professional knowledge and professional practice, through splitting the problem, concretizing the problem and deductive reasoning, and finally using these skills or knowledge to solve the problem.

3.4.2 the electives are

ENGG1111:Intergrated Engineering 1: ENGG1111:Intergrated Engineering 1:ENGG1111 greatly integrates the teaching mode of professional knowledge and practice. Among them, the open design project emphasizes basic engineering and professional practical skills, and guides students to improve and integrate various abilities in the application. Through the learning of engineering knowledge, critical reflection and self-assessment, to enhance their lifelong learning ability. During this period, there were frequent communications, design projects and case studies. According to The University of Sydney(2021),students can experience the engineering design process, manage projects up close, and understand the importance of ethics, safety and sustainability.

DATA1002:Informatics: Data1002 focus on learning informatics.The University of EDINBURGH mentions: Informatics is the study of the structure, behaviour, and interactions of natural and engineered computational systems(The University of EDINBURGH, nd).In more detail, it includes calculations and data processing, and the complexity of existing commonly used software Use (such as spreadsheets), use python language to develop custom software, etc.

3.4.3 knowledge and capabilities will be developed by undertaking these electives

ENGG1111:Intergrated Engineering 1: Professional knowledge includes the understanding of basic engineering, the use of various equipment, and the use of various programming knowledge and various online tools. Through learning and practice, students can master the ability to communicate effectively with team members. Secondly, students have also strengthened their ability to acquire new knowledge, so that they can keep up with the speed of knowledge updating and not be eliminated even after entering the industry. In addition, the ability to solve problems and propose innovative solutions has also been improved.

DATA1002:Informatics: professional knowledge includes algorithms, social cognition, complex use methods of various data processing software, python programming knowledge, model construction methods and image construction methods, understanding of data system structure and behavior, etc. Professional capabilities include using python to develop simple custom programs and automate common processes of data processing, being able to use models to solve practical problems, and screening hardware and software to provide users with a better experience.

3.4.4 how these electives might complement the knowledge and capabilities developed as part of the relevant major

ENGG1111:Intergrated Engineering 1: In Bachelor of Advanced Computing, Integrated Engineering and software development are inextricably linked. DRM Associates (2002) suggests that: Software development is the process of conceiving, specifying, designing, programming, documenting, testing, and bug fixing involved in creating and maintaining applications, frameworks, or other software components, including research, new development, prototyping, modification, reuse, re-engineering, maintenance, or any other activities that result in software products. , The programming requirements required for engineering design are getting higher and higher, and the cumbersome procedures and details make excellent software indispensable. Not only that, but the bugs generated by the use of a large number of programs are also very tricky. It is easy to exercise at this time. It is the ability of students to use programming knowledge to solve vulnerabilities, thus making the road to software development smoother.

DATA1002:Informatics: The informatics learned in Data1002 can be applied to any computer-related place, let alone software development. Informatics can build innovative computing tools and applications and help us to interact intuitively with technology (Indiana University, n.d.). Data processing in the context of the new era requires high efficiency, brief introduction, and clarity. It tests whether students have good programming habits and excellent skills. Programming ability, people who are proficient in python can use simple programs to design powerful software to filter data. During this period, the ability to use programming to solve practical problems is exactly what software development needs.

3.4.5 if the knowledge and capabilities developed by undertaking these electives will assist in your professional career

ENGG1111:Intergrated Engineering 1: First of all, we should fully understand the current situation of the industry. Engineers need to have a very wide range of knowledge reserves, including physics, chemistry and mathematics and their knowledge of material science, solids and fluid mechanics, etc., and this knowledge is continuously updated every day , Ralph J. Smith (1999) mentioned in the article: Many engineers continue to learn new materials throughout their careers. The learning skills cultivated in this course will enable students to quickly adapt to the working environment in the future, and rely on new knowledge to solve novel problems. The ability to communicate and solve practical problems formed during this period can better enable students to transition from school to the workplace.

DATA1002:Informatics: Informatics directly provides services for production and management. As many researches need to be supported by data, it has a very broad application prospect. In addition, by studying this elective course, students will develop their interest and ability in data modeling, and they will perform well in the fields of finance, medicine or artificial intelligence that require big data support in the future.

3.4.6 if there are any opportunities resulting from undertaking these electives

ENGG1111:Intergrated Engineering 1: Opportunity: (1) Administrative Assistant: Perform office work and paperwork, including entering data into the system, taking notes at meetings, managing the calendar, and helping the executive team handle daily work. (2) Warehouse Associate: build and package products, transport, receive, organize, clean and periodically count goods in a professional team.

DATA1002:Informatics: Opportunity: As mentioned above, Informatics is widely used and also provides many employment opportunities. KU MEDICAL CENTER (2020) points out: There are roles within informatics to suit several different personality types. Extroverts who like working with people make great trainers for health.

4 Contributions

4.0.1 Management:

The team consider the management of the group to be relatively simple thanks to advanced technologies and lack of language barriers. Firstly, our communication is done through wechat, a multi-purpose messaging and social media app. Secondly, We implemented a milestone system where work is divided up into smaller fractions and each to be due on dedicated dates. lastly, the team leader would occasionally starts a zoom session to explain more complicated instructions and exemplify expected output of each member.

4.0.2 Teamwork:

1. During planning, the team join a voice chat for to research for each major and electives. We discussed not only what electives suits the best and each shared their opinion but also provide thought provocative ideas and research for each other.

2. During development stage, we use git as a collaborate version control system both to combine our individual works into a main file to compile into ultimate results and also to prevent deadly mistakes using branches to develop individually.

3. There is also use of zoom to demonstrate how git and latex is used properly to help others get started. During review stage, every member contributes critical feedbacks about the outcome of the report and each toke action to perfect their individual work.

4.0.3 Difficulties and challenges:

- Not everyone is one the same level when using git and latex, branches operations and sub filing is confusing to some teammates.

- Helong Wei reported difficulties with accesses using git as he was originally using the business version of git.

- Taoyi Xu reported difficulties during formatting of bibtex which is lead by most of his sources is type online websites as it is difficult to access relevent scholar articles.

- Different style of writing that makes the report loose some cohesion, getting everyone to standardize on one style is challenging and ineffective.

- Bibtex merging resulted in several conflicts.

- Some areas and electives are not easy to find articles support the claims.

- Language barrier does take a role in both writing and researching as all four of the team members are Chinese, which cultural differences also has an affect on definition of "beneficial."

- One incident of someone pushing not debugged program to remote master branch caused chaos.

4.0.4 Things to change:

- Branch and test before pushing into remote repository should be more strictly enforced upon.

- To have more scholar level article to support some of the claims is more beneficial.

- Writing in more presentable style (bullet points and line breaks) instead of raw paragraphs

- Have numeric statistics as evidence.

4.0.5 Work distribution:

Each team member is meant to research and write a recommendation of electives outside of computing to students with the computing major assigned to each member. These acts as the body of the report while the team leader build and structured the report by building latex files that allows everyone to only need to work on their subfiles, settled up remote git repositories, and made sure each member have clear understanding of their work and have reasonable electives with solid research.

4.0.6 Contributions of each team members:

Qiyuan Sun is the team leader and is responsible for setting up the working environment such as recreating the report using the template given in pdf, development base files for each subfile and bibtex, creating and managing access to remote git repositories, and nevertheless writing introduction, contribution and the information system recommendations in the report. Helong wei is responsible for the data science recommendations in the report. He also contributed by providing thoughtful ideas during planning, and helping others understand the project better. Taoyi Xu is responsible for the Computer science recommendations in the report. He also contributed using quality researches and providing additional information in detail, he also provided many ideas for this contribution about our difficulties and what we should plan to improve on. Yuren Long is responsible for the software development recommendations in the report. He also contributed with reflective feedbacks on both planning stage and reviewing stage that further improved the quality of the work.

5 Bibliography

References

Baets, W. (1992). Aligning information systems with business strategy. *The Journal of Strategic Information Systems*, *1*(4), 205–213.

Blvd, R. (2008). *Information systems and informatics.* Retrieved 2008-09-30, from `https://www.kumc.edu/school-of-health-professions/health-information-management`

Contributor, T. (2017). *Empirical analysis.* Retrieved 2017-09-30, from `https://whatis.techtarget.com/definition/empirical-analysis`

Levas, A., Jain, P., Boyd, S., & Tulskie, W. (1995). Panel discussion on the role of modeling and simulation in business process reengineering. In *Winter simulation conference proceedings, 1995.* (pp. 1341–1346).

of Edinburgh, T. U. (2008). *What is informatics?* Retrieved 2008-09-30, from `https://www.ed.ac.uk/files/atoms/files/what20is20informatics.pdf`

R.CHOW, A. (2020). 'there's a wide-open horizon of possibility.' musicians are using ai to create otherwise impossible new songs. *https://time.com/5774723/ai-music/*, *31*(10). Retrieved from `https://time.com/5774723/ai-music/` doi: 10.1002/dac.3568

Send, E. (2005). *Empiricism in computer science.* Retrieved 2005-09-30, from `http://www.inf.fu-berlin.de/inst/ag-se/teaching/S-Komponenten-2005/SendE05-Empirical.pdf`

Smith, R. J. (1999). *Engineering science.* Retrieved 1997-09-30, from `https://www.britannica.com/technology/engineering`

TheUniversityofSydney. (2021a). *Badp1001: Empirical thinking.* Retrieved 2020-09-30, from `https://www.sydney.edu.au/units/BADP1001`

TheUniversityofSydney. (2021b). *Badp2001: Algorithmic architecture.* Retrieved 2020-09-30, from `https://www.sydney.edu.au/units/BADP2001`

TheUniversityofSydney. (2021c). *Buss1000: Future of business.* Retrieved 2020-09-30, from `https://www.sydney.edu.au/units/BUSS1000`

TheUniversityofSydney. (2021d). *Buss1020: Quantitative business analysis.* Retrieved 2020-09-30, from `https://www.sydney.edu.au/units/BUSS1020`

TheUniversityofSydney. (2021e). *Cmpn1013 creative music technology.* Retrieved 2020-09-30, from `https://www.sydney.edu.au/units/CMPN1013`

TheUniversityofSydney. (2021f). *Cmpn1014 sound recording fundamentals.* Retrieved 2020-09-30, from `https://www.sydney.edu.au/units/CMPN1014`

Toh, K., Nagel, P., & Oakden, R. (2009). A business and ict architecture for a logistics city. *International Journal of Production Economics*, *122*(1), 216–228.

Tucker, A. (2020). *Computer science.* Retrieved from `https://www.britannica.com/science/computer-science`

University, I. (2021). *What is informatics?* Retrieved 2020-09-30, from `https://soic.iupui.edu/what-is-informatics/`