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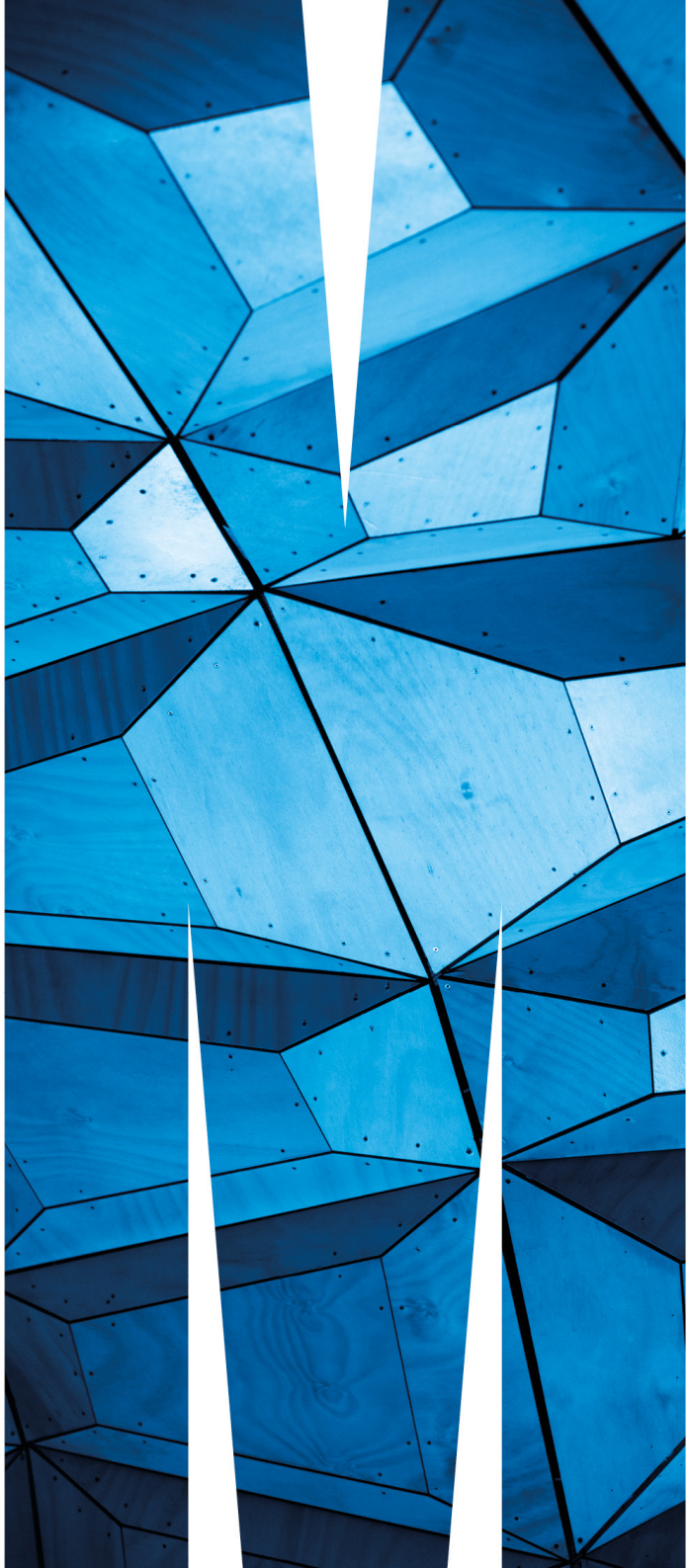
INFORMATION
TECHNOLOGY



FIT4003 Semester 2 2020
Software engineering research project

Week 12:
Academic Paper Writing

Chunyang Chen

GROUP OF EIGHT AUSTRALIA

FIT4003 Learning Outcome

- After working your way through this module, you should be able to:
  - explore in greater depth the field of software engineering with a practical emphasis and develop project proposal
  - critically review research literature, research design and reported findings;
  - logically assess different alternatives and compare and contrast these works to develop a solution to a problem of interest;
  - conduct ethical research;
  - **communicate research findings in written and oral form in research and industry settings.**

Improvement of Paper Draft

- Well done on intro, background/related work, discussion!!!
- Discuss the further improvement of the report with **practical examples**
- Improvement:
  - Title creation
  - Result analysis
  - Information display
  - Minor

Title

- Pandemic Software Development: The Student Experience

- Is there any better title for it?
  - Predictable, interesting, reflect tone, keywords

Hairston, M., & Keene, M. 2003. Successful writing. 5th ed. New York: Norton.

Learn & Collaborate during Pandemic: Students' Motivation and Lessons in Developing Pandemic Software

By the Pandemic and for the Pandemic: Students' Lessons and Challenges for Developing a COVID-19 Information Dashboard

Tip: Make title clear, meaningful, compact, attracting.

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Result Analysis

Result analysis

- RQ2: What challenges do students experience when working on a COVID-19 project during the COVID-19 pandemic?
- List many challenges: work-life balance, distraction, pure online, consistent motivation, etc.

Table V. Generally speaking, none of the challenges were agreed by more than 50% of the participants. Approximately 40% of students considered balancing their commitments to be a challenge (statement C1). Given that the COVID-

- That result is out of our expectation, why?

The contributors to the project were required to work from home as per the government restrictions in Australia. Approximately 50% of participants agreed that establishing a work-life balance while working from home was a challenge (statement C6). Subsequently, 34% responded that it was challenging to manage distractions while working from home (statement C5), and 31% found it difficult to stay motivated while working from home (statement C8).

Result analysis

- Will those results influenced by the participants' background?

- According to participants' demographics, you may disseminate results in term of different aspects:
  - Gender (e.g., male, female)
  - Team (e.g., data, development)
  - Experience (e.g., programming years, project experience)
  - Education (e.g., undergraduate, postgraduate)

- That issue also exists in other research questions:

> As mentioned earlier, 74% of the students had no software development experience in industry before joining the project, which may have resulted in the team being strongly motivated by the desire to learn new skills and technologies (77%), and gaining experience for their CV (69%). Moreover, participants

Result analysis

- Further analysis with detailed table:

	C1	C2	C3	C4	C5
Data					
Promotion					
Development					
Visualization					

- Pick up important conclusion and put the rest to appendix/website

Tip: Always ask why and take multiple factors into the consideration during data analysis.

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Information Display

Information display

- Are there any issues of this display of information?
- Is there any improvement for it?

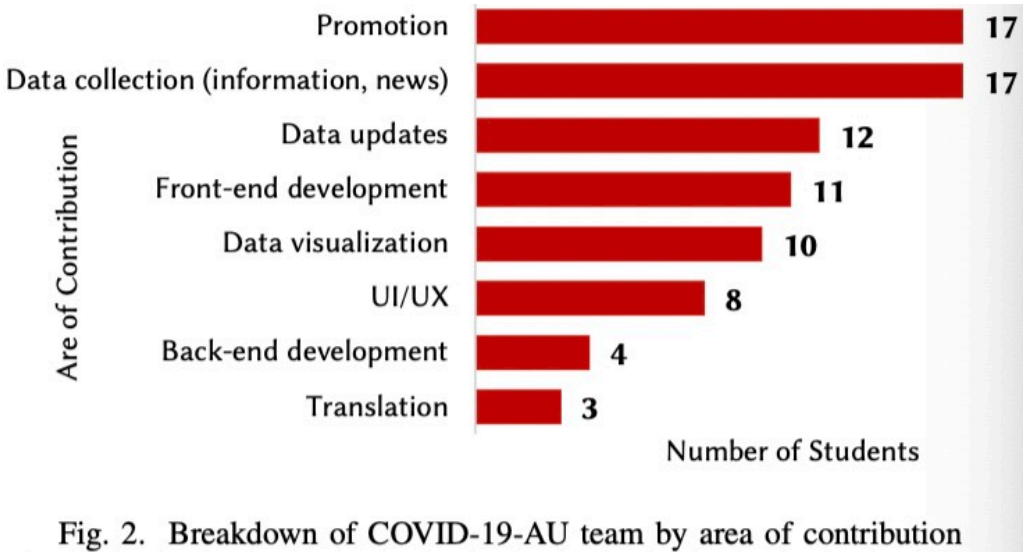

Fig. 2. Breakdown of COVID-19-AU team by area of contribution

TABLE II
TEAM SEPARATION WITH DIFFERENT FOCUS

Team	#Num	Responsibility
Promotion	17	Promote the website in different channels
Data collection	17	Collect general info (e.g., policy, symptom)
Data update	12	Live number update from government site
Front-end dev	11	Develop front-end website
Data vis	10	Visualize the statistics interactively
UI/UX	8	Graphical UI design and user experience
Back-end dev	4	Develop back-end
Translation	3	Develop multi-lingual site

Information display

- Are there any issues of this display of information?

TABLE IV
LIST OF GENERAL CHALLENGE AND SURVEY RESPONSES (IN %). STA: STRONGLY AGREE, A: AGREE, SWA: SOMEWHAT AGREE, SWD: SOMEWHAT DISAGREE, D: DISAGREE

ID	Statements	STA	A	SWA	SWD	D	STD
C1	It was difficult for me to balance my university commitments and working on this project	2.94	8.82	26.47	14.71	32.35	14.71
C2	It was difficult to manage my mental health while working on this project from home	0.00	5.26	7.89	7.89	31.58	47.37
C3	It was difficult to manage my physical health while working on this project	2.56	2.56	2.56	7.69	43.59	41.03
C4	It was difficult for me to work on this project from home	0.00	7.69	5.13	12.82	33.33	41.03
C5	It was difficult for me to keep my attention away from distractions while working from home	0.00	17.95	15.38	12.82	33.33	20.51
C6	It was difficult to establish a work-life balance while working from home	5.13	20.51	23.08	7.69	20.51	23.08
C7	It was difficult to set up my own productive workspace while working from home	2.56	12.82	10.26	10.26	33.33	30.77
C8	It was difficult for me to stay motivated while working from home	5.13	12.82	15.38	20.51	25.64	20.51
C9	It was difficult for me to collaborate with the team through a purely online medium	2.56	12.82	12.82	17.95	28.21	25.64
C10	It was difficult for me to work in a purely online medium	0.00	7.89	5.26	18.42	44.74	23.68

TABLE V
LIST OF GENERAL CHALLENGES AND RESPONSES (IN %). 3: STRONGLY AGREE, 2: AGREE, 1: SOMEWHAT AGREE, -1: SOMEWHAT DISAGREE, -2: DISAGREE, -3: STRONGLY DISAGREE

ID	Challenge	3	2	1	-1	-2	-3
C1	Balance my university commitments and working on this project	2.94	8.82	26.47	14.71	**32.35**	14.71
C2	Manage my mental health while working on this project from home	0.00	5.26	7.89	7.89	31.58	**47.37**
C3	Manage physical health while working on this project	2.56	2.56	2.56	7.69	**43.59**	41.03
C4	Work on this project from home	0.00	7.69	5.13	12.82	33.33	**41.03**
C5	Keep attention away from distractions while working from home	0.00	17.95	15.38	12.82	**33.33**	20.51
C6	Establish a work-life balance while working from home	5.13	20.51	**23.08**	7.69	20.51	**23.08**
C7	Set up my own productive workspace while working from home	2.56	12.82	10.26	10.26	**33.33**	30.77
C8	Stay motivated while working from home	5.13	12.82	15.38	20.51	**25.64**	20.51
C9	Collaborate with the team through a purely online medium	2.56	12.82	12.82	17.95	**28.21**	25.64
C10	Work in a purely online medium	0.00	7.89	5.26	18.42	**44.74**	23.68

Information display

Tip: Adopt a suitable visualization form for displaying data and make it clear.

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Minor revision

Minor revision

- URL reference

In light of this, a team of 48 student volunteers has developed the COVID-19-AU information dashboard (covid-19-au.com)

In light of this, a team of 48 student volunteers has developed the COVID-19-AU information dashboard[1] whilst working

[1]https://covid-19-au.com/

- Use exact number

All contributors recognised they had grown roughly 20% more confident in teamwork. Some participants who stepped up to lead in specific areas or in discussions reported they grew about 28% more confident in their leadership skills. Many students especially noticed a rise in self-confidence, expressing

- Alignment between text and figure

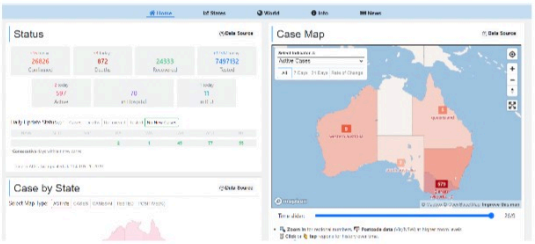

Fig. 1. COVID-19-au.com Dashboard

and inaccuracy of the data provided through government sources. More generally, the students also expressed difficulty in maintaining a work-life balance while working from home and in forming relationships with the other contributors as the project's development was entirely online. As mitigation strategies to these challenges, the students most frequently used clear language when messaging other team members. Team morale was also maintained through vocal appreciation of the work and by encouraging the other contributors. Overall, the students exhibited a growth in their technical and non-technical skills, particularly in their front-end development skills, understanding of COVID-19 and ability to work online.

Our work makes the following contributions:

- A better understating of the student experience in pandemic software development.
- Practical implications for students, researchers, and policymakers.

II. Background

A. COVID-19

COVID-19 is an infectious disease that has resulted in a global pandemic [4]. As of September 3, 2020, there have been 25,884,895 confirmed cases of COVID-19 and 859,130 confirmed deaths [5]. The pandemic has severely impacted the lives of many vulnerable communities, affecting both physical and mental health. Studies have shown that there has been a sharp drop in life satisfaction amongst people around the world, including Australians, and an increase in psychological distress levels [6].

Like other countries, the Australian government introduced legislative restrictions to minimise the spread of the disease [7]. These restrictions included limiting public gatherings, shutting down on-site working alongside encouraging working from home (WFH), and limiting the reasons for leaving the house. In regions with a higher number of cases, such as Melbourne, further restrictions were implemented, for example, placing a 5km radius restriction on an individual travelling from their house or a mandatory curfew by which individuals must return home. Additionally, these restrictions resulted in the closure of Australian university campuses, with students and staff needing to transition into an online environment [8].

B. COVID-19 Information Dashboard

Through the progression of this pandemic, a plethora of information about the disease has become publicly available through many different sources, such as news outlets, federal and state reports, and social media [9]. The consolidation of these sources can be overwhelming due to inaccuracies or inconsistencies between their content.

In response to this challenge, the COVID-19 information dashboard was developed as a data aggregation software for COVID-19 information. The website aims to help Australians stay informed on key areas of the disease, such as case numbers, outbreak hot spots and relevant news articles. Fig. 1 is a snippet of the information dashboard.

1) Contributors: The COVID-19 information dashboard project is an open source software (OSS) that is maintained and managed by a team of 48 volunteers, largely comprising of university students. These students were recruited primarily through advertisements on student social spaces and by word of mouth. The team includes several key areas: data collection, data visualization, web development, and marketing. Many of the participants did not have prior expertise in relation to their area of contribution. The majority of participants also had no prior professional experience in working on a software project. A further breakdown of the team's demographics is presented in Section IV-A.

2) Features: The COVID-19 information dashboard displays a variety of metrics on COVID-19. The confirmed cases, active cases, recovered cases, test numbers, hospital numbers, and deaths are presented both numerically and through heat map visualizations. The specificity of the data can also be varied between a national view, state view, and local government area view. In addition, time series data visualizations are also available to view historical figures or trends in the data. Other key features of the website also include a global comparison of COVID-19 between Australia and other nations, demographic analysis of the pandemic by state, and a timeline of COVID-

Tip: Detail matters.

Week 12 Summary

- So far, we have discussed:
  - Attracting title
  - In-depth data analysis
  - Suitable information display
  - Careful detail

- Other general suggestions:
  - Start from draft and keep improving
  - Discuss widely for getting feedback
  - Practice makes perfect

Week 12 Summary

- Further reading