



# PROGRAMMING EDUCATION BY TEAM RNG (EH5)

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ABERTAY UNIVERSITY, DUNDEE, 2021



# THE CLIENT

- Dr Suzanne Prior
  - Abertay Cybersecurity Staff
  - Introductory Programming lecturer



# THE BRIEF



Plagiarism is an issue



GUI frontend for MOSS  
tool



Improve efficiency for  
programming lecturers



# OVERVIEW

- Product Requirements and Vision
- Development Methodology
- Development Timeline
- Cost/Benefit Analysis
- Anticipated Risks
- How We Are Ensuring Team Efficiency





# REQUIREMENTS



Use MOSS tool from Stanford University as back end.



Import large volume of submissions from zip file.



Produce relevant output to the screen.



Simple, easy to use interface.



# END PRODUCT

- Completed MOSS GUI utility.
- Simple, easy to understand UI
- .zip archive of code files can be read in and processed automatically.
- Graphical output on screen detailing cases of plagiarism detected.

## MOSS GUI UTILITY

Drag and drop  
files here or click  
to upload

Files:

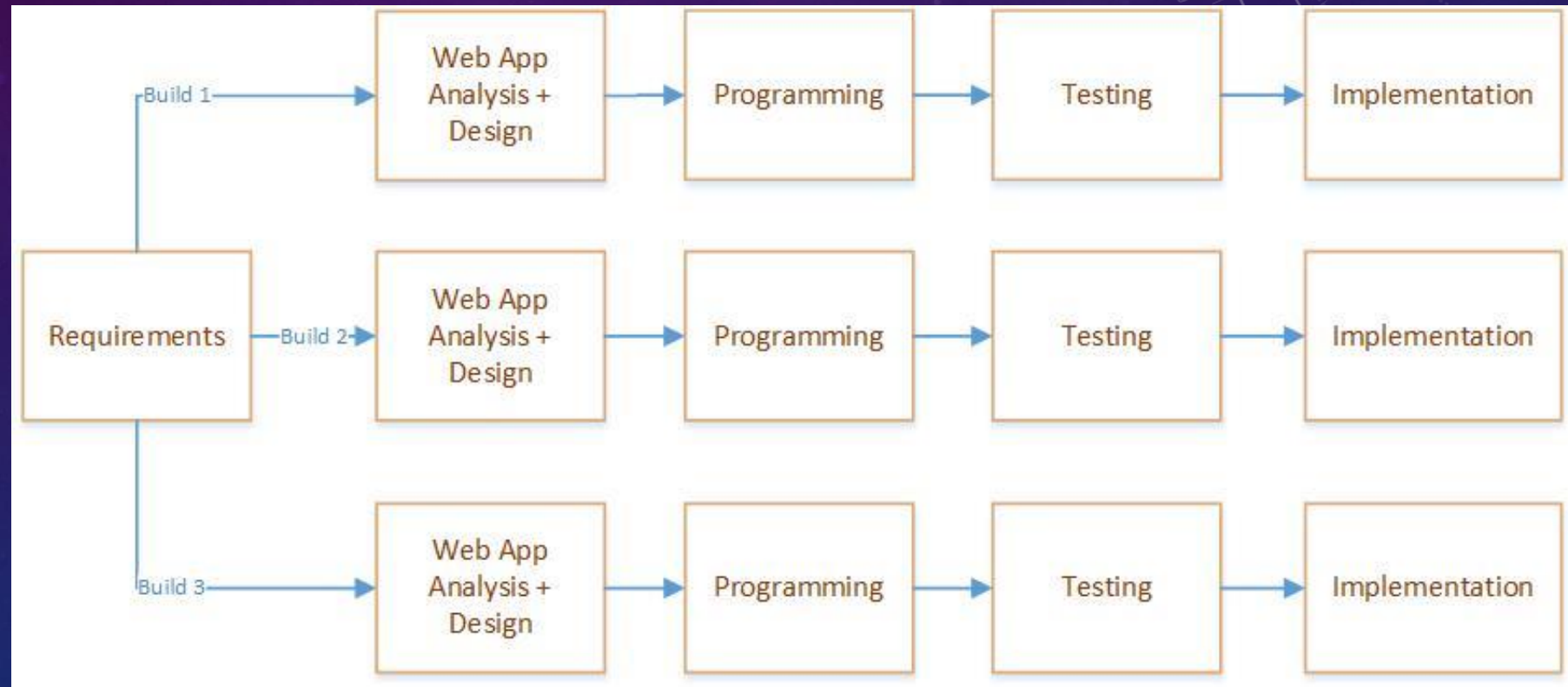
```
student1.cpp  
student1.h  
student2.cpp  
student 2.h  
student3.cpp  
student3.h
```

SUBMIT

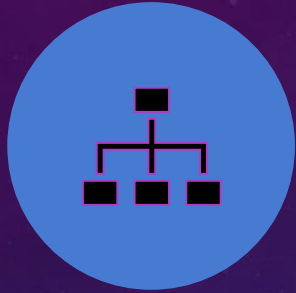


# METHODOLOGY

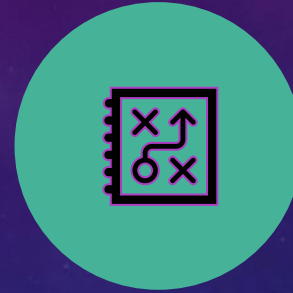
- Incremental Model.
- Programming Project.
- Will return high quality work.
- Suitable for our prototyping approach.
- Example Model.



# WHY INCREMENTAL?



We chose Incremental as complexity is high, but uncertainty is not.



If you don't like the direction we are going, we can make changes during the project if needed.



Incremental model suits our plan to prototype the web app.



The project needs to be delivered very quickly, in around 12 weeks.





# GANTT CHART

ID	Tasks	Planned Start	Planned Finish	Feb 2022					Mar 2022					Apr 2022			
				30/1	6/2	13/2	20/2	27/2	6/3	13/3	20/3	27/3	3/4	10/4	17/4	24/4	
1	User Interface Design	31/01/2022	10/02/2022	[Bar from 30/1 to 6/2]													
2	Working GUI	10/02/2022	10/02/2022	[Milestone diamond at 6/2]													
3	Testing	10/02/2022	14/04/2022	[Bar from 6/2 to 17/4]													
4	Web app styling	10/02/2022	07/04/2022	[Bar from 6/2 to 10/4]													
5	Web app styling complete	07/04/2022	07/04/2022	[Milestone diamond at 10/4]													
6	Fixing bugs / Polishing	10/02/2022	25/04/2022	[Bar from 6/2 to 24/4]													
7	Extracting zip file contents to the page	10/02/2022	02/03/2022	[Bar from 6/2 to 13/3]													
8	Code files sending to MOSS successfully	02/03/2022	22/03/2022	[Bar from 13/3 to 20/3]													
9	MOSS displays results on upload page	22/03/2022	07/04/2022	[Bar from 20/3 to 3/4]													
10	MOSS tasks complete	07/04/2022	07/04/2022	[Milestone diamond at 3/4]													
11	Testing complete	14/04/2022	14/04/2022	[Milestone diamond at 10/4]													
12	Finished development - Sign off	25/04/2022	25/04/2022	[Milestone diamond at 24/4]													



# COST/BENEFIT ANALYSIS

Type	Description	Result
Benefit	Elimination of "download-unzip-search-scan process"	User's time will be saved.
Benefit	GUI	<ul style="list-style-type: none"><li>• GUI will improve user experience.</li><li>• Intuitive GUI reduces need for software training.</li></ul>
Benefit	Improved detection rate	The automation of user operations will improve detection rate by eliminating human error.
Benefit	Accessibility	A web application will be accessible on majority of devices connected to the internet.



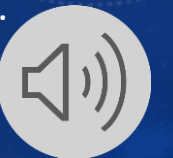
# COST/BENEFIT ANALYSIS

Type	Description	Result
Cost	Development	Development would cost around £6,711 if managed and developed by the external team.
Cost	Web server maintenance	Depending on client requirements - <ul style="list-style-type: none"> <li>• £50 per month for Azure app service.</li> <li>• £9.91 per month for Hostinger's VPS.</li> <li>• \$12 (£8.79) per month for DigitalOcean app platform.</li> </ul>
Potential cost	Domain name and SSL certificate	<ul style="list-style-type: none"> <li>• Around £12 for a domain name for 2 years.</li> <li>• CloudFlare offers free SSL certificates.</li> </ul>
Potential cost	Web server set up	It is impossible to estimate web server set up costs at this stage, this will depend on the hosting service and programming languages/frameworks used.
Potential cost	MOSS license	Moss is for non-commercial use only.

\*Average salary per hour in the UK for- junior programmers £9.29, project manager £20, tester £8.5, graphic designer £10.74.

\*The Averages were taken from - <https://www.payscale.com/research/Country>

\*The time used is 100 hours. As shown in module descriptor under "Teaching and Learning Work Loads".



# ANTICIPATED RISKS

- Risk one: Team member leaves the university (R1).
- Risk Two: Pandemic restrictions are reinstated (R2).
- Risk Three: End result is not what the client expected (R3).

Probability of Risk	High		<b>R1</b>	
	Moderate		<b>R2</b>	
	Low			<b>R3</b>
		Low	Moderate	High
		Impact of Risk		





# ANTICIPATED RISKS

The approach to minimising the stated risks:

- Good communication will allow the team to redistribute work in case of a member leaving.
- Experience of working through a lockdown before and implementation of communication tools.
- Regular updates with the client will ensure the project is taking shape as they expect it too.



# WHAT WE NEED TO RESEARCH

To effectively work on this project, we will need to:

- Look at the moss code in more detail to better understand how it works
- Research how to design GUI (Graphic user interface)
- Research advantages and disadvantages of hosting a web-based app



# WHAT SKILLS WE NEED TO WORK ON

Skills we can improve upon to increase efficiency:

- Improve individual problem-solving skills
- Work on our communication as a team
- Work on time management skills



# CONCLUSION

- Successful risk mitigation strategy
- Confident in our cost benefit analysis of the project
- Clear Layout of the Costs and Benefits to the Client
- We aim for transparency in this project.
  - if any questions email Isaac at [1901124@uad.ac.uk](mailto:1901124@uad.ac.uk)





THANK YOU

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