

Original Risk Register

ID	Date raised	Risk Description	Likelihood of the risk occurring	Impact if the risk occurs	Severity	Owner	Monitoring Strategy	Mitigation Plan	Actual Mitigation + Risk Description	Updated Mitigation
1	17/8/2023	Software bugs in the system risk	High	High	High	Head of programmer	Ensure that code always runs as expected before working and developing upon the existing code. This is to monitor the current code and ensure that it works.	<ol style="list-style-type: none"> Develop test cases using unittest. Make sure code works without error before pushing to gitlab. 	<p>26/9/2023 - In the standup meeting conducted, we found out that there were many functionalities that had bugs, such as the buttons not linking to the correct page. This would have been a big issue if not fixed.</p> <p>During the meeting, a tester was assigned to test the software thoroughly. Changes were made to fix the bugs in the software afterwards. Made sure there were no more bugs before submission.</p>	<ol style="list-style-type: none"> Have an assigned tester to do the chosen testing method on the software occasionally. If there is any bug found, let the team know, and fix it immediately. Often check for any bugs in the systems, during and outside of meetings.
2	25/8/2023	Conflict of ideas between team members risk	High	High	High	Scrum Master	Ensure that conversations are moderated by the third person participating in the conversation. The person is responsible to monitor and detect when the conversation becomes heated.	<ol style="list-style-type: none"> Both sides must ensure that they listen to the opposite views. Both sides must agree that everyone is working towards the same project goal. Gather consensus from all team members to decide which option to choose to move forward. 	<p>26/9/2023 - During the standup meeting conducted, there were conflicts of ideas between two members. This resulted in both sides being very confused, and having different goals.</p> <p>Discussions were held, and the conflict was resolved in a short time. Both sides were compromising each other, with the idea to reach the same project goal. Other team members were involved in the decision-making.</p>	<ol style="list-style-type: none"> It is important for both sides to communicate and listen to each other. Any conflict must be solved immediately, to prevent any confusion in the future that may affect the process of the project. Involve other team members if conflict cannot be solved.
3	25/8/2023	Team member burnout risk	High	High	High	Scrum team	Observe team spirits during meetings and each person should be vigilant in detecting when negative emotions are brought up during conversations as that could be a sign of burnout.	<ol style="list-style-type: none"> Organise wellness programs for the team to support mental health Give support and motivation to team members when members are feeling down or discouraged due to overwhelming load from projects or other units. Encourage and create a positive working environment for the team. 	<p>14/9/2023 - By the end of the first sprint, all team members felt quite burnout from the work done. This resulted in the team not feeling motivated to continue onto the second sprint. A lot of time was wasted on no progress at all by all team members.</p> <p>Our first meeting was held a few days later, and a sprint goal was set, along with task allocations. Everyone was back on track, and started working on the second sprint.</p>	<ol style="list-style-type: none"> Meetings should be held not long after each sprint end, to re-motivate team members. Make sure that all team members are feeling fine to continuously work on the next sprint.
4	27/08/2023	Data Leak Risk	High	High	High	Scrum team	Ensure that detailed logs of who accessed what data and when is being tracked to ensure	<ol style="list-style-type: none"> Limit who has access to more sensitive data Encrypt sensitive data 		

							that the data access is monitored and data leak is prevented.	3. Regularly update and patch the software.		
5	17/8/2023	Lack of communication risk	Medium	High	Medium	Scrum Master	If there is a lack of communication, it should be visible because team members will not be aware of each others' progress.	1. Weekly Standup Meetings 2. Use Google Docs for Centralised Documentation	22/9/2023 - A few team members went out of town or country due to the mid-semester break. This resulted in them being uncontactable for a period of time. Some tasks are left undone, and the rest of the team members are not able to proceed with the project. We eventually managed to contact them, and issues were resolved in a short time. Meetings were continuously held without absent team members. Some tasks are re-allocated and done on time.	1. Communicate with the team for any plans in advance. 2. If unable to do an allocated task on time, let the team know immediately. 3. Meetings must still be held even if there is any member absent.
6	21/8/2023	Unrealistic or unreasonable requirements	Medium	High	Medium	Product Owner	Ensure that the group has frequent communications with the client to clarify all the expectations and address any unreasonable expectation when needed. This can be monitored through discussion internally with the scrum team to determine if the requirements are unrealistic or unreasonable.	1. Negotiate with the client and provide reasonable alternatives. 2. Give examples of successful alternatives to clients.		
7	25/8/2023	Unrealistic time frame given risk	Medium	High	Medium	Product owner	This can be monitored by observing the current sprint or product backlog. Through internal discussion, the team can decide if the time frame for such tasks are unrealistic or reasonable.	1. Plan the project ahead, make sure the tasks are divided reasonably for each iteration. 2. Estimation of the time needed to finish each task must be done. 3. Avoid taking on extra tasks that clients did not ask for.		
8	25/08/2023	Unethical approach or conduct risk	Medium	High	Medium	Scrum team	Ensure a strict ethical guideline is implemented. This can be monitored by researching the methodology or code used to ensure that it is ethical.	1. All team members should be aware of the ethics and ethical behaviours that should be maintained. 2. Immediate action must be taken and investigation must be done by the entire team when an unethical behaviour has been conducted.		
9	25/08/202	Depen	Medium	High	Medium	Scrum	This can be	1. Ensure that		

	3	dency on third-party libraries or APIs risk				team	monitored by observing the libraries that are imported and used in the code.	licences are compliant, and regularly check for updates or changes to third-party components.		
10	27/08/2023	Project Quality Risk	Medium	High	Medium	Scrum team	This can be monitored and maintained by having regular code reviews to ensure the quality is being maintained.	1. Ensure that all team members consistently check the requirements when building the system for each user story.		
11	17/8/2023	Conflicts not resolved in a timely manner	Medium	Medium	Medium	Scrum master	Observe if there is any negativity lingering during discussions. If there is, conflicts should be resolved as soon as possible.	1. Weekly standups for conflict resolution 2. Vote by general consensus after hearing from each side		
12	17/8/2023	Lack of skills resources risk	Medium	Medium	Medium	Scrum team	Ensure that all team members have prior knowledge to the resources needed in this project. This is monitored by making sure that all team members present their findings during the stand-up meetings.	1. Online resources 2. Each team member studies content accordingly. 3. Seek help to other team members when needed.	<p>21/9/2023 - A lot of tasks cannot be done smoothly because some team members did not have necessary skills needed for the project. Progress of the project was greatly delayed.</p> <p>Spike stories, including youtube videos, websites, and courses were added. Team members that are aware that they are lacking in the fields assigned themselves to the spike stories.</p>	1. Spike stories can be added for members to learn from. 2. If there are any delays in progress, other members can help out.
13	17/8/2023	Uneven work distribution risk	Medium	Medium	Medium	Scrum team	If there is uneven work distribution, it should be detected as soon as possible. It should be visible by observing the task list for each team member. Therefore, if there's an obvious difference between each other, there is an uneven work distribution.	1. Weekly discussion on the topics or project that has to be done and make sure everyone is satisfied with their workload. 2. If workload is too burdening, the team member should voice out to other members in the team. 3. Make sure everyone is clear with their roles and responsibility and make sure that everyone in the team is satisfied with their roles.		
14	25/8/2023	Limited access to resources risk	Medium	Medium	Medium	Scrum team	This can be detected when there are limited references when doing a report or when there is difficulty in developing the code due to limited online resources.	1. Identify all the necessary resources needed early on during planning. 2. Find alternatives to access materials or software tools if some are not accessible to us.		

								3. Leverage library resources or seek support from faculty.		
15	25/08/2023	Scheduling conflicts and clashes risk	Medium	Medium	Medium	Scrum team	Ensure the team does frequent updates and transparency on scheduling, to ensure a more efficient scheduling process. This can be monitored by observing the scrum team members' class timetable.	<ol style="list-style-type: none"> 1. Organise google calendar for everyone to input their scheduling day by day. 2. Communicate within teams often and find the best time when everyone is available. 3. Use scheduling tools such as LettuceMeet. 	<p>25/9/2023 - There were scheduling conflicts due to the mid-semester break. Some members had travel plans and commitments ahead of time. Meeting had to be rescheduled multiple times</p> <p>Everyone had a discussion in the group chat to find out the availability of each member. Found a suitable time to meet online. Made sure that everyone was available at the agreed time.</p>	<ol style="list-style-type: none"> 1. Ensure transparency between team members on scheduling matters. 2. Discussions must be done between team members to find a suitable time for everyone to be available.
16	25/08/2023	Inconsistent user experience across platforms risk	Medium	Medium	Medium	Scrum team	This can be monitored by observing the graphics and interface across platforms when it has been deployed.	<ol style="list-style-type: none"> 1. Ensure that regular testing is conducted on different devices and browsers, following responsive design principles. 		
17	17/8/2023	Team members' health risk	Low	High	Low	Product Owner	Regularly communicate with team members about their health status. This is monitored by making sure that members update their current health status.	<ol style="list-style-type: none"> 1. Discuss with client to negotiate possible extension of deadline. 2. Discuss with other team members who are willing to hand over the tasks assigned to that member. 3. Ensure to exercise daily. 4. Ensure to stay hydrated everyday. 	<p>25/9/2023 - A team member fell sick in the middle of the sprint. Tasks allocated were not done in the expected time frame.</p> <p>Task was transferred to another team member, and done in time. No delay in progress was met.</p>	<ol style="list-style-type: none"> 1. Make sure to report to the group immediately if any team member falls sick. 2. Tasks can be reallocated to another team member. 3. Aim to not delay the progress of the sprint.
18	21/8/2023	Academic misconduct risk	Low	High	Low	Scrum team	Ensure that all the work are sent into a plagiarism checker or checked by all team members, before submission. This can be monitored with a plagiarism checker.	<ol style="list-style-type: none"> 1. Each team member is responsible for their own work. 2. If a member is suspected of breaching academic misconduct, the team will try to solve the problem personally. If the issue is not solved over time, approach the teaching team. 		
19	25/8/2023	Laptop hardware breakdown risk	Low	High	Low	Scrum team	Ensure and monitor that hardware works as expected before continuing on to code and develop upon the current repository.	<ol style="list-style-type: none"> 1. Ensure that backup copy is made and saved after every change. 2. Utilise gitlab for version control to save code to a repository. 3. Ensure that all 	<p>5/9/2023 - One team member's laptop broke down during the middle of the sprint. No data was lost, as everything was backed up in GitLab.</p> <p>Laptop was fixed on the day, not a lot of</p>	<ol style="list-style-type: none"> 1. Avoid accidents like this from happening. 2. Make sure all changes made are informed to the group. 3. Report the accident immediately if

								team members have their own backup of the new code.	time was wasted.	any occurred.
20	25/8/2023	Natural disasters risk	Low	High	Low	Scrum team	This can be monitored by looking at the natural disaster forecast online.	<ol style="list-style-type: none"> 1. Plan ahead for extreme weather that may cause any possible natural disasters. 2. No exact way to solve this issue, workload will have to be carried over to other team members if it happens to specific people. 		
21	25/8/2023	Loss of key personnel risk	Low	High	Low	Scrum Master	Ensure open communication within the team. The loss of key personnel can be monitored by keeping track of the group chat. If a particular scrum member does not respond after several days, actions have to be taken.	<ol style="list-style-type: none"> 1. All team members should frequently update about their progress. 2. If risk does occur, workload will have to be fairly divided amongst the rest of the team members. 3. Scrum master should monitor the scrum team at all times for any irregularities. 		
22	25/08/2023	Data Loss Risk	Low	High	Low	Scrum team	This can be monitored by observing any data loss before continuing to expand on the existing code base.	<ol style="list-style-type: none"> 1. Ensure that the code base is backed up in several locations: <ol style="list-style-type: none"> a. Online (GitLab, Google Drive) b. Offline (Scrum team's hard drive) 	<p>4/9/2023 - One team member accidentally pushed and committed the changes into the main branch. Some coding data that was previously done by other members were lost.</p> <p>Team members reverted the changes and made sure the lost data were retrieved.</p>	<ol style="list-style-type: none"> 1. Ensure that backup copy is made and saved after every change. 2. Utilise gitlab for version control to save code to a repository. 3. Ensure that all team members have their own backup of the new code.
23	21/8/2023	Poor time management risk	Low	Medium	Low	Scrum team	Ensure that all the tasks are completed on schedule and identify any potential delays early. Everyone should monitor their time management and ensure that they complete tasks before the dateline.	<ol style="list-style-type: none"> 1. All team members should share their management plans and all team members can review it. 2. If a team member is struggling with time management and falling behind on the project, a meeting will be held to address and resolve this matter. 		
24	25/8/2023	Poor process management risk	Medium	Low	Low	Scrum master	Ensure that the team understands their roles respectively and any inquiries must be addressed immediately.	<ol style="list-style-type: none"> 1. Scrum master should understand their role properly and is able to provide guidance to the team, and address concerns with the scrum 		

								team. 2. Seek for consultation from the teaching team to check if the team is on track.		
25	21/8/2023	Overdue project risk	Medium	Low	Low	Scrum team	Ensure that all team members are transparent with each other about their current workload over time. Make sure each members' voices are heard. Everyone should be responsible to monitor the project deadline regularly.	1. Weekly checkup on each member's workload. 2. Discussion on tasks handover to other team members if necessary. 3. All team members work together to make sure the work gets done, despite the amount of other workloads.		
26	9/9/2023	Firebase Interruption	Medium	High	High	Scrum team	Ensure that each member hosts their own firebase for testing purposes so that it will not interrupt the main firebase for the software.	1. Utilise multiple Firebase projects to minimise the impact of interruptions on a project. 2. Regularly backup critical user data stored in Firebase to prevent data loss in case an interruption occurs.	9/9/2023 - Everyone working on the code was working on the same firebase instance. There were lots of instances where team members were confused about the tasks added or deleted when testing. Not a big issue, as it only happened during testing. Some team members decided to host their own Firebase for testing purposes. No important data was lost.	
27	18/9/2023	Hosting Security Risk	Low	High	Low	Product Owner	Ensure that software hosted is completely secured. Implement Real-time monitoring and regular testing,	1. Prioritise and implement timely software updates and security patches. 2. Enforce strong authentication measures, like multi-factor authentication 3. Regularly review and restrict user access based on roles and responsibilities.	18/9/2023 - On this date, the website hosted was flagged for phishing and violating the terms of services. Hosted website was taken down, and users are not able to use it anymore. We re-enabled the website, with a more secure hosting system. No data was lost, and the website was back online in a short time.	

Table 4.2: Risk register

New Risks Discovered

ID	Date raised	Risk Description	Likelihood of the risk occurring	Impact if the risk occurs	Severity	Owner	Monitoring Strategy	Mitigation Plan
26	9/9/2023	Firebase Interruption	Low	High	Low	Scrum team	Ensure that each member hosts their own Firebase instance for	1. Utilise multiple Firebase projects to minimise the impact of interruptions on a

							testing purposes so that it will not interrupt the main Firebase instance for the software.	project. 2. Regularly backup critical user data stored in Firestore to prevent data loss in case an interruption occurs.
27	18/9/2023	Hosting Security Risk	Low	High	Low	Product Owner	Ensure that software hosted is completely secured. Implement Real-time monitoring and regular testing,	1. Prioritise and implement timely software updates and security patches. 2. Enforce strong authentication measures, like multi-factor authentication 3. Regularly review and restrict user access based on roles and responsibilities.

Table 3.3.1: New Risks Added

Risks that Occurred During First Sprint (31/8/2023 - 14/9/2023)

ID	Occurati on Date	Risk Description	Severity	Details	How the issue was resolved	Future Mitigation
22	4/9/2023	Data Loss Risk	Low	1. One team member accidentally pushed and committed the changes into the main branch. 2. Some coding data that was previously done by other members were lost. 3. Data lost was not severe, and was retrievable.	Team members reverted the changes and made sure the lost data were retrieved.	1. Avoid accidents like this from happening. 2. Make sure all changes made are informed to the group. 3. Report the accident immediately if any occurred.
19	5/9/2023	Laptop hardware breakdown risk	Low	1. One team member's laptop broke down during the middle of the sprint. 2. No data was lost, as everything was backed up in GitLab.	Laptop was fixed on the day, not a lot of time was wasted.	1. Ensure that backup copy is made and saved after every change. 2. Utilise gitlab for version control to save code to a repository. 3. Ensure that all team members have their own backup of the new code.
26	9/9/2023	Firebase Interruption	Low	1. Everyone working on the code was working on the same firebase instance. 2. There were lots of instances where team members were confused about the tasks added or deleted when testing.	Not a big issue, as it only happened during testing. Some team members decided to host their own Firebase for testing purposes. No important data was lost.	1. Utilise multiple Firebase projects to minimise the impact of interruptions on a project. 2. Regularly backup critical user data stored in Firestore to prevent data loss in case an interruption occurs.

Table 3.3.2: Live and Updated Risk During the First Sprint

Risks that Occurred During Second Sprint (14/9/2023 - 5/10/2023)

ID	Occurati on Date	Risk Description	Severity	Details	How the issue was resolved	Future Mitigation
03	14/9/2023	Team member burnout risk	High	<ol style="list-style-type: none"> 1. By the end of the first sprint, all team members felt quite burnout from the work done. 2. This resulted in the team not feeling motivated to continue onto the second sprint. 3. A lot of time was wasted on no progress at all by all team members. 	Our first meeting was held a few days after the first sprint ended, and a sprint goal was set, along with task allocations. Everyone was back on track, and started working on the second sprint.	<ol style="list-style-type: none"> 1. Meetings should be held not long after each sprint end, to re-motivate team members. 2. Make sure that all team members are feeling fine to continuously work on the next sprint.
27	18/9/2023	Hosting Security Risk	Low	<ol style="list-style-type: none"> 1. On this date, the website hosted was flagged for phishing and violating the terms of services. 2. Hosted website was taken down, and users are not able to use it anymore. 	We re-enabled the website, with a more secure hosting system. No data was lost, and the website was back online in a short time.	<ol style="list-style-type: none"> 1. Prioritise and implement timely software updates and security patches. 2. Enforce strong authentication measures, like multi-factor authentication. 3. Regularly review and restrict user access based on roles and responsibilities.
05	22/9/2023	Lack of communicat ion risk	Medium	<ol style="list-style-type: none"> 1. A few team members went out of town or country due to the mid-semester break. 2. This resulted in them being uncontactable for a period of time. 3. Some tasks are left undone, and the rest of the team members are not able to proceed with the project. 	We eventually managed to contact them, and issues were resolved in a short time. Meetings were continuously held without absent team members. Some tasks are re-allocated and done on time.	<ol style="list-style-type: none"> 1. Communicate with the team for any plans in advance. 2. If unable to do an allocated task on time, let the team know immediately. 3. Meetings must still be held even if there is any member absent.
12	22/9/2023	Lack of skills resources risk	Medium	<ol style="list-style-type: none"> 1. A lot of tasks cannot be done smoothly because some team members did not have necessary skills needed for the project. 2. Progress of the project was greatly delayed. 	Spike stories, including youtube videos, websites, and courses were added. Team members that are aware that they are lacking in the fields assigned themselves to the spike stories.	<ol style="list-style-type: none"> 1. Spike stories can be added for members to learn from. 2. If there are any delays in progress, other members can help out.
15	25/9/2023	Scheduling conflicts and clashes risk	Medium	<ol style="list-style-type: none"> 1. There were scheduling conflicts due to the mid-semester break. 2. Some members had travel plans and commitments ahead of time. 3. Meeting had to be rescheduled multiple times 	Everyone had a discussion in the group chat to find out the availability of each member. Found a suitable time to meet online. Made sure that everyone was available at the agreed time.	<ol style="list-style-type: none"> 1. Ensure transparency between team members on scheduling matters. 2. Discussions must be done between team members to find a suitable time for everyone to be available.

17	25/9/2023	Team members' health risk	Low	<ol style="list-style-type: none"> 1. A team member fell sick in the middle of the sprint. 2. Tasks allocated were not done in the expected time frame. 	Task was transferred to another team member, and done in time. No delay in progress was met.	<ol style="list-style-type: none"> 4. Make sure to report to the group immediately if any team member falls sick. 5. Tasks can be reallocated to another team member. 6. Aim to not delay the progress of the sprint.
02	26/9/2023	Conflict of ideas between team members risk	High	<ol style="list-style-type: none"> 1. During the standup meeting conducted, there were conflicts of ideas between two members. 2. This resulted in both sides being very confused, and having different goals. 	Discussions were held, and the conflict was resolved in a short time. Both sides were compromising each other, with the idea to reach the same project goal. Other team members were involved in the decision-making.	<ol style="list-style-type: none"> 1. It is important for both sides to communicate and listen to each other. 2. Any conflict must be solved immediately, to prevent any confusion in the future that may affect the process of the project. 3. Involve other team members if conflict cannot be solved.
01	26/9/2023	Software bugs in the system risk	High	<ol style="list-style-type: none"> 1. In the standup meeting conducted, we found out that there were many functionalities that had bugs, such as the buttons not linking to the correct page. 2. This would have been a big issue if not fixed. 	During the meeting, a tester was assigned to test the software thoroughly. Changes were made to fix the bugs in the software afterwards. Made sure there were no more bugs before submission.	<ol style="list-style-type: none"> 1. Have an assigned tester to do the chosen testing method on the software occasionally. 2. If there is any bug found, let the team know, and fix it immediately. 3. Often check for any bugs in the systems, during and outside of meetings.

Table 3.3.2: Live and Updated Risk During the Second Sprint