

Risk Assessment and Mitigation

Assessment 1: **Team 14: Bass2**

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(a)

Introduction and Process

This section will outline the risks that may occur in the project as well as how we can mitigate the effects of them. We will be using the risk management process outlined in the book *Software Engineering, Sommerville Ian* [1]. Another process/outline that has been researched is the 'ProRisk Management framework' as described in G. G. Roy, "A risk management framework for software engineering practice," [2] however this framework is above and beyond the scope necessary for the project.

Ian Sommerville describes the process of creating a risk assessment in 4 steps [1, p645].

- **Step one:** In this step we have discussed the risks and listed them in the table below. The process of this involved going through each stage/section of the project and identifying the possible things that could affect the project using the list of types or risks described by Sommerville as a starting point, as well as an additional section that wasn't listed which was those risks that come with the current Covid19 pandemic. [1, p647]
- **Step two** is to analyse the risk. As a part of this we have decided to describe the likelihood of risks as 'low', 'moderate' or 'high'. We feel this gives enough detail for the relatively small size of the project we are doing. Another option would be to add additional classifications such as 'low/moderate' or 'moderate/high' but this we feel is unnecessary and overcomplicates the classification. The consequences we will describe as 'Catastrophic', 'serious', 'tolerable' or 'Insignificant'. Alternatively we could classify them as 1-5 but using words is much easier to understand when referred to later.
- **Step three** is to create a plan for each risk to mitigate the effects of it if it were to happen. Where possible we will add multiple options for this to create an even more robust plan.
- **Step four** involves monitoring the risks and revising the assessment when more is known. To do this somebody will review this document every week, making relevant changes if necessary and updating the team on any changes that have been made and if a risk is becoming more likely.

The risk assessment will be displayed in tabular form in the following pages. This will take the format of 'ID', 'Risk category', 'Risk description', 'Probability', 'Consequence', 'mitigation' and 'notes'. The note section will contain the date that the risk was added and any assessments the person monitoring the risk has, for example 'the rates of covid are increasing. This risk probability has increased from 'moderate' to 'high'. This note section enables the team and customer to monitor the project in more detail as the risks evolve.

(b) Risk Catalogue

ID	Risk Category	Risk Description	Probability	Consequence	Mitigation	Notes
000	Estimation	Major bugs persisting into final versions of the product due to underestimation of time allocated for testing. It could prevent the player from continuing to play.	Low	Catastrophic	To mitigate this we will implement test-driven development. This will ideally mean that major bugs will be avoided entirely, meaning major bugs are unlikely to persist into potentially final products. The game will allow the player to restart the game.	- Expanded to account for bugs that prevent further play (28/04/22)
001	Estimation	Technical debt* with underestimated avalanche causing the product as a whole to be more prone to breaking when being upgraded.	High Medium	Tolerable	One way to mitigate this would be to keep a record of all the places where hack-solutions are used, and to not build upon areas where these are in place without first resolving them. This will increase the strength of the base code, meaning it is less likely to fall apart.	- Technical Debt is the concept of a build-up of weak code throughout a project that is set up with the “bit of a hack, but it works” mentality in order to save time in production. A little debt speeds development so long as it is paid back promptly with a rewrite [3] - Changed probability to medium as each member has now researched and understands the effects of technical debt prior to beginning implementation however not all people doing implementation have much Java/Libgdx experience (15/01/2022)
002	Estimation	A delay in one section of the project causing a knock on effect and a rushed or late submission.	Medium	Serious	Team members will be reassigned from dependent sections of work to work on the one that has been delayed.	- Changed mitigation plan to match our team's preferred way of working (28/04/22)
003	Requirements	Misunderstand requirements of project.	Medium	Serious	We had customer meetings. We will contact our customer if unsure about requirements in any way. We have all read the briefing documents multiple times and are checking VLE announcements and emails for the module. We are checking requirements while working on the game so if there is a misunderstanding we will realise sooner.	- The rereading of the brief led to the realisation that a part of documentation had been missed (24/01/22) - Merged two risks together and updated mitigation plan (28/04/22)
004	Technology/People	Work is lost due to bugs in tools, corrupted data, unsaved work etc.	Low	Tolerable - Catastrophic	To mitigate this, GitHub will be used so that there is a local copy of the repository each time someone pulls the repository. Save regularly.	- Merged two risks together and expanded with other cases where work could be lost (28/04/22)

005	COVID/People	Team member falls ill (with COVID-19 or otherwise).	Medium	Tolerable - Serious	Depending on the illness, have online meetings via discord if contagious so all members can attend without it spreading to other members of the team and/or take some measures in face-to-face meetings like using hand gel regularly, and distribute that member's responsibilities among other members if they are not able to do the work.	- There are many options for this, most likely we will use discord as the server is already set up - Updated to state that we will use discord for online meetings and expanded to include other illnesses (28/04/22)
007	COVID	Local/National Lockdown resulting in inability to meet in person.	Medium High Low	Serious	To mitigate this, all documentation will be stored on the cloud so it can be accessed remotely so that in the event that we cannot meet in person, there is no reduced access to material.	- Updated to high risk due to new highest daily cases reported in the UK of 246,418 29/12/21 [4] (30/12/21) - Updated to low risk due to statement by HSA that Omicron is relatively mild for most adults and this can be stated with good confidence [5] (16/01/21)
008	Requirements	Change of requirements causing delays due to difficulty editing code.	Low	Serious	To mitigate this it is important that the codebase contains well documented and well laid out code.	
009	Technology	Member's computer has a fault or their internet connection becomes unreliable.	Low - Medium	Insignificant - Tolerable	Member uses a laptop or phone if possible. Have local backups and use Zoom for dial-in alternatives to join meetings. Can use an on-campus PC in both cases.	- Changed to include the option of using on-campus PC's (28/04/22)
010	Tools	Significant update causing incompatibility.	Medium	Tolerable - Serious	Keep previous versions of software for backtracking if the issues are serious.	
011	People	Member/s become/s unexpectedly busy over a significant period (a week or longer) or stops study.	Medium	Tolerable - Serious	Distribute at least some of that member's responsibilities among other members for that period. No short tasks planned to be in progress when the holidays begin and allow time for more work to be done after the break.	- Risk added (28/04/22)
012	Tools	There's an issue with discord that prevents the team from using it for a period (an hour or more) or a member's discord account gets hacked.	Low	Insignificant - Tolerable	If resolved within a few hours, the team can use emails to communicate, any important information can be accessed from the google drive, and if the issue persists the team can switch to using a different tool. If an account is hacked, change password or if the account is lost, make a new one.	- Risk added (28/04/22)
013	People	Conflicting opinions.	High	Tolerable	Decisions are based on what the majority think if there isn't a consensus after some discussion of opinions.	- Risk added (28/04/22)

Environmental Risk Factors

There are a number of environmental factors related to the wider project as a whole. These can be broken down into: [6]

- Relationships between team members
- Constraints
- Team member Motivation
- Skill Set, Experience
- Organisation

Relationships between team members is the most important of these factors since a strong sense of team identity, commitment and trust is integral to every element of the project. Being strong in these areas will allow us to work fluidly and efficiently without having any internal issues that may waste time and instead allow us to have open discussions about how we feel certain parts of the project should be approached.

Furthermore there are **constraints** that may end up causing significant delays for the group. For example, clashing schedules over the Christmas holidays are likely to stop the full group meeting and slow down the development process of certain parts of the project.

In addition, constraints related to each team member, specifically their motivation, skill set and experience could affect not only how team members gel together but also how work is distributed amongst members of the team and how much weight each member is pulling.

Finally, **team organisation** is a crucial element of this project and if not done correctly could lead to a significant amount of lost time across the project's duration. For example, if there is not clear communication between who is doing what then we could have multiple people doing the exact same thing which would be a clear failure in planning. Instead we plan to use a number of software tools in order to optimise our communication and organisation and allow our work to be fairly and effectively distributed.

Bibliography

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- [6] H. Khan, M. Mahrin, and S. Chuprat, "Environmental Factors Influencing Requirement Engineering in Global Software Development: A Review.," presented at the Proc. of the Second Intl. Conf. on Advances in Computer and Information Technology-, ACIT, 2013, [Online]. Available: https://www.researchgate.net/publication/265851676_Environmental_Factors_Influencing_Requirement_Engineering_in_Global_Software_Development_A_Review.