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***SOEN SOLUTIONS***  
**TESTING PLAN**

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Version 1.3  
*03/17/2021*

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# 1 INTRODUCTION

## 1.1 PURPOSE OF THE RISK MANAGEMENT PLAN

A risk is defined as exposing something of value to a potential danger, harm or loss. In our scenario, it would be an event that yields positive or negative repercussions on the objectives of our project. The main purpose of a Risk Management Plan is to have a document that will allow the members of the project to foresee the potential risks, determine their impact and plan a response. The Risk Management Plan is valued because it'll cost less to handle the risks before they occur and cause damage to the project. The plan will also contain the list of activities that will take place to handle the risks that'll occur during the development phase. Unmanaged risks can be a large burden on the progression of a project, which is why the proper development of the Risk Management Plan is vital to the success of a project.

## 2 RISK MANAGEMENT PROCEDURE

### 2.1 PROCESS

The process for managing a potential project will be divided into 4 different steps: Risk Identification, Risk Analysis, Risk Response and Risk Monitoring, Controlling, and Reporting. Each of these steps will be explained in detail, in their own individual sections. In this section, we will provide a surface level explanation for each step of the risk management plan. Risk Identification is the identification and listing of potential risks that could arise. The next step, Risk Analysis, is the prioritization and categorization of the list of risks. After that there will be the Risk Response where we will come up with a response plan for each risk. The final step, Risk Monitoring, Controlling and Reporting, will be the tracking of the risks and the confirmation that the responses are being applied appropriately.

### 2.2 RISK IDENTIFICATION

The Risk Identification phase will entail the group to compile a list of potential risks linked to the project. This list will be referred to as the Risk Register. There are multiple ways the group could identify risks, one being taking a look at similar projects, from the past, and learning the problems they've run into. Each risk will have the same set of parameters that gives more insight into the nature and gravity of the risk: Description of Risk, Probability, Impact, Priority, Triggers and Response Plan. The description of the risk entails providing a brief summary (or definition) of the risk. The description should follow this format: **Event** may occur, causing **Impact** <sup>[2]</sup>. Probability is the likelihood of the risk occurring during the project and Impact is the gravity of the effect of the occurrence of the risk. Priority is the importance of the assessment of the risk compared to the other listed risks. Triggers are the events that could potentially lead to the manifestation of the risks. Lastly, the Response Plan is the plan on how to handle a risk, we'll elaborate on this parameter in another section.

## 2.3 RISK ANALYSIS

During the Risk Analysis phase, the group will have to determine which risks will have the higher importance. The team will also separate the list of risks into categories. For the group to be able to rank the degree of importance of each, they will have to use two of the parameters, from the risk identification, linked to each risk: Probability and Impact. The probability and impact, of each risk, will receive a rate on a scale of 1 to 10. We will now explain how to attribute a rate to the probability and the impact. For the probability, we will assess how often an event has occurred during previous projects. For example, if an event has occurred 3 times in the last 20 projects, then it will have a probability of 15%. For the impact, it will be determined using 3 variables, who will each receive a rating from 1 to 10: cost (1 - Low Cost : 10 - Expensive), schedule (1 - Very Flexible : 10 Very Tight), quality (1 - Very Low : 10 - Very High). Using the ratings for each variable, the average will be calculated, and we will consider it as the impact rating. Afterwards, the probability percentage will be multiplied by the impact rating divided by 10. The priority will be determined by ranking the result of that multiplication, for each risk, from highest to lowest.

### 2.3.1 Qualitative Risk Analysis

#### Probability

- High – Greater than 70% probability of occurrence
- Medium – Between 30% and 70% probability of occurrence
- Low – Below 30% probability of occurrence

#### Impact

- High – Risk that has the potential to greatly impact project cost, project schedule or performance
- Medium – Risk that has the potential to slightly impact project cost, project schedule or performance
- Low – Risk that has relatively little impact on cost, schedule or performance

Risk Assessment				Risk Management	
Risk ID	Description	Probability	Impact	Resolved in sprint	Solution (Strategy and Effectiveness)
Stakeholder Risks					
SR1	Scheduling Conflicts	High	High	1	The use of a website like when2meet.com and continuous discussion through Discord helps to resolve times where everyone meeting was not possible.  Strategy: Mitigate Effectiveness: Moderate
SR2	Team Conflict	Low	Moderate	N/A	Continuous conversation through Discord, both about the project and otherwise, so that issues, blocks, and conflicts are being discussed thoroughly so

					that we can move past them quickly.  Strategy: Mitigate Effectiveness: High
<b>Tools Risk</b>					
T1	Some members are unfamiliar with React/NodeJS	Moderate	Low	N/A	Any problems using the tools will be resolved by reading documentation and by asking teammates for help.  Strategy: Mitigate Effectiveness: Moderate
<b>Requirements Risk</b>					
R1	Inefficient design for bicycle model in ERP	Moderate	Moderate		Remodelling must be done if this occurs, hopefully only to a small degree.  Strategy: Accept Effectiveness: Low
R2	The end result is incapable of meeting the loading time requirements	Low	Moderate	N/A	The load times will be monitored as changes are made to see which changes affect the times. Any increases will be addressed (chosen to be fixed as a bug or left if not severe)  Strategy: Avoid Effectiveness: High
R3	Poor design in Software Architecture Design document (SAD)	Moderate	Moderate	1	Software architecture is continually discussed and has been discussed thoroughly in the planning of the project, and should therefore have minimal flaws, if any at all. If it does happen that the design is flawed, slight changes to fix will be made.  Strategy: Avoid Effectiveness: High
<b>Estimation Risk</b>					
E1	Underestimating time or effort taken to complete a task	High	Moderate	N/A	Any task that seems to require more effort than originally planned will have extra support from the rest of the team. In this way, everyone is aware of the tasks currently being done and there is a larger collaborative effort as the project moves along. This does mean that more people will have to work to complete the task if needed.

					Strategy: Mitigate Effectiveness: Low
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Table 1: Risks, their probability, impact, and solution, accompanied by a Risk Management Log below.

Risk Management Log:

- January 28, 2021 - SR1: Scheduling conflicts were dealt with by using when2meet.com and filling availability to figure out the best time and day for an online meeting.
- February 21, 2021 - R2: The website load time is currently within the allotted time.
- February 21, 2021 - T1: The team has begun to learn the tools. Cristian has taken the lead on doing the startup of the project because he is familiar with the technologies we are using. Otherwise, the team is working on adding features according to the mockups designed in Sprint 1.
- February 21, 2021 - E1: Much of the team has become busy with other courses and assignments at this time, and so this risk may come into play soon. The team is planning to work extensively on February 22, because this is when other assignments and midterms are due/completed.
- February 22, 2021 - SR1: Having a new teammate right before the end of a sprint and right when we were supposed to have a meeting caused them to be absent, but this was dealt with by informing the missing person on what their task would be and when they needed to have it done by (the sprint deadline).
- February 23, 2021 - SR2: A small conflict on which icon to use for the product category led to a debate between a few members. This was quickly resolved with the use of a compromise, where key parts of both icons were used for a new icon.
- February 23, 2021 - E1: A release plan was made for sprint 3 where estimates were made for each sub task this time to ensure task length and user story estimation based on each sub task. This is a more effective way of estimating the effort required for each task.
- February 24, 2021 - E1: The new member was given the issue #6 (CAPTCHA), and the time taken to do it increased due to the member not being set up for the project and coming in blind to the project to do a task.
- February 24, 2021 - SR1: A member of our team has a makeup exam at the time of the demo, so we will be requesting to move the demo. However, if this does not work, we will simply have to do the demo without them and inform them on the topics discussed in the next meeting.
- March 14, 2021 - SR1: Most of the team is unable to make it to the scheduled meeting to delegate remaining tasks for the sprint due to studying, differing time zones, and other such reasons. As such, we now run the risk of not finishing some of the planned tasks that will most likely be moved to the next sprint. Moreover, this meeting was moved to March 16, instead.
- March 17, 2021 - E1: Due to the previous point in the log on March 14, 2021, some of the tasks were not completed for sprint 3. This is specifically in reference to issues like #14 on GitHub, that is not linked to sprint 3 due to us not being able to finish it and other related issues.

It is important to note that many of the risks in the previous table are much better dealt with since many of us have become used to online communication and working from home given the pandemic. For instance, risk SR1 and SR2 have become less probable since people spend less time in transit to and from school, and because we are in continuous communication through Discord. However, some of the risks remain as they most likely would be without the pandemic, for example, E1 would not change as it is simply a risk with the estimation of project requirements and tasks.

### 2.3.2 Quantitative Risk Analysis

Analysis of risk events that have been prioritized using the qualitative risk analysis process and their effect on project activities will be estimated, a numerical rating applied to each risk based on this analysis, and then documented in this section of the risk management plan. The quantitative assessment will be done on a scale from 1 to 5, where 0 is the lowest amount of risk a situation presents and 5 is the highest.

- SR1: 5 - This is because scheduling conflicts can lead to the project not being discussed at all for a certain amount of time, delaying the work that needs to be done and causing a greater chance of late submission and being low on time.
- SR2: 1 - The chance of this happening is low due to the fact that everyone in the group has an upbeat attitude and is getting along well so far. As time goes on the chance of it happening increases, but the resolution of such issues should not be difficult.
- T1: 1 - This is a risk that has to be taken for the project, as in any language or framework there is, some of the group will not know it and the same issue will arise, where the solution is to simply work and learn together.
- R1: 3 - The ERP being poorly designed is a low probability occurrence as there are many of us in direct communications with the authors of the requirements (teachers and teaching assistants), and thus any misunderstandings of the ERP design can be asked about. However, the impact of a mistake could cause larger structural/architectural changes to the project, increasing the risk value of R1.
- R2: 2 - The project not meeting the loading requirement is low chance and moderate impact because the load times will be monitored throughout the project and dealt with as if it gets larger early on.
- R3: 2 - Poor design of the software architecture is improbable and has a moderate impact because any mistakes will be caught early as they are revealed through the development. This means we would simply need to update the SAD with any changes from the original plan.
- E1: 4 - Underestimating task length is a high probability issue as we are all relatively new to the agile process and task effort estimation. The impact will be moderate because we are forced to put in the extra time to meet the deadlines for each sprint, or to work harder in the next one.

## 2.4 RISK RESPONSE PLANNING

In the Risk Response Phase, the team will have to determine how much time they'll spend on a risk. The time spent on a risk will also determine the approach that will be taken. There are four potential approaches for each major risk: Avoid, Mitigate, Accept, Transfer. **Avoid** is the elimination of the threat by eliminating the cause. **Mitigate** is the identification of ways to reduce the probability and/or impact of the risk. **Accept** is the approach where the group does nothing to handle the risk. Finally, we have **Transfer**

which is where we give the responsibilities of the handling of the risk to someone else. Depending on the level (Low, Moderate, High) of the risk, we'll associate the approach that needs to be taken. The linking of the approach to the level of impact and probability of the risk isn't an exact science, it can be determined at the discretion of the project group. After choosing an approach, a plan of action can be established to solve the risk.

Probability	Impact	Approach
Low	Low	Accept
Low	Moderate	Accept
Low	High	Transfer
Moderate	Low	Mitigate
Moderate	Moderate	Transfer
Moderate	High	Avoid
High	Low	Mitigate
High	Moderate	Transfer
High	High	Avoid

## 2.5 RISK MONITORING, CONTROLLING, AND REPORTING

During the project, our list of risks will be constantly changing. This will force us to have to be constantly tracking our risks, identifying new risks and establishing new response plans.

## 3 TOOLS AND PRACTICES

A Risk Log will be maintained under Table 1 of this document such that the risks and their descriptions can easily be accessed while viewing the risk log.



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## RISK MANAGEMENT PLAN APPROVAL

The undersigned acknowledge they have reviewed the **Risk Management Plan** for the *SOEN SOLUTIONS* project. Changes to this Risk Management Plan will be coordinated with and approved by the undersigned or their designated representatives.

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## APPENDIX A: REFERENCES

The following table summarizes the documents referenced in this document.

Document Name and Version	Description	Location
Software Architecture Document 1.0	The SAD is the formal description of the architecture of our product and its associated user stories, etc.	<a href="https://drive.google.com/file/d/1SMCPtA6287_uDV0gsBTXm_YITDJM-MuU/view?usp=sharing">https://drive.google.com/file/d/1SMCPtA6287_uDV0gsBTXm_YITDJM-MuU/view?usp=sharing</a>
Project Risk	This page informs users on the different phases of risk management	<a href="https://www.projectengineer.net/knowledge-areas/project-risk/">https://www.projectengineer.net/knowledge-areas/project-risk/</a>

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**APPENDIX B: KEY TERMS**

The following table provides definitions for terms relevant to the Risk Management Plan.

Term	Definition
SAD	Software Architecture Document: The document containing information about the software architecture of the project, the user stories, etc.
ERP	Enterprise Resource Planning: The category of software that this project fits in. ERP refers to a software that allows management and tracking of resources used for the creation of a product and its sale.