

**Campus Meal Ordering System**

**Risk Management Plan**

**By *Team Foodie***

**Lab Group: TS3**

**Date: October 2020**

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# **SCHOOL OF COMPUTER SCIENCE AND ENGINEERING**

**NANYANG TECHNOLOGICAL UNIVERSITY**

**VERSION HISTORY**

| **Version #** | **Implemented**  **By** | **Revision**  **Date** | **Approved**  **By** | **Approval**  **Date** | **Reason** |
| --- | --- | --- | --- | --- | --- |
| 0.1 |  |  |  |  | -Initial Risk Management Plan draft |
| 0.4 | Renice Loh | 10/10/20 | <name> | <mm/dd/yy> | 1. Risk Management Process 2. Risk Identification 3. Risk Analysis |
| 06 | Jun Yi |  |  |  | 1. Risk Response Planning 2. Risk Monitoring |
| 0.7 | Jun Yi |  |  |  | 1. Risk Identification 2. Risk Analysis |
| 0.8 | Renice |  |  |  | 1. Risk Response Planning 2. Appendix |
| 0.9 | Jun Yi |  |  |  | 1. Appendix |
| 1.0 | Jun Yi |  |  |  | 1. Impact of Risk |

**UP Template Version**: 10/10/20

**TABLE OF CONTENTS**

[**INTRODUCTION**](#_54jiyo2mnjol) **1**

[PURPOSE OF THE RISK MANAGEMENT PLAN](#_1fob9te) 1

[**RISK MANAGEMENT PROCEDURE**](#_tyjcwt) **1**

[PROCESS](#_3dy6vkm) 1

[RISK IDENTIFICATION](#_qqed347gm4e3) 2

[RISK ANALYSIS](#_82xcl55a8wvo) 2

[Qualitative Risk Analysis](#_khfzihsa1a7) 3

[Quantitative Risk Analysis](#_tkjxbbi8z2x7) 4

[RISK RESPONSE PLANNING](#_bfyjhuahc9ms) 4

[RISK MONITORING, CONTROLLING, AND REPORTING](#_4kof7zqv9yic) 6

[**TOOLS AND PRACTICES**](#_j0i7viu7vtfz) **6**

# **INTRODUCTION**

## **PURPOSE OF THE RISK MANAGEMENT PLAN**

A risk is an event or condition that, if it occurs, could have a positive or negative effect on a project’s objectives. Risk Management is the process of identifying, assessing, responding to, monitoring, and reporting risks. This Risk Management Plan defines how risks associated with the ***Campus Meal Ordering System (CMOS)*** project will be identified, analyzed, and managed. It outlines how risk management activities will be performed, recorded, and monitored throughout the lifecycle of the project and provides templates and practices for recording and prioritizing risks.

The Risk Management Plan is created by the project manager in the Planning Phase of the CDC Unified Process and is monitored and updated throughout the project.

The intended audience of this document is the project team, project sponsor and management.

# **RISK MANAGEMENT PROCEDURE**

## **PROCESS**

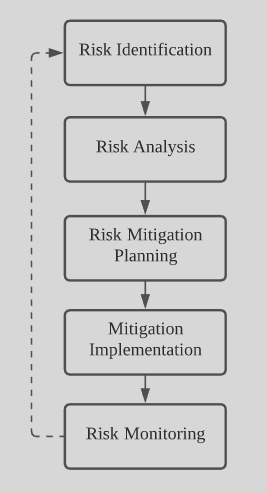


Figure 1: Risk Management Process

The project manager working with the project team and project sponsors will ensure that risks are actively identified, analyzed, and managed throughout the life of the project. Risks will be identified as early as possible in the project so as to minimize their impact. The steps for accomplishing this are outlined in the following sections. The Project Manager will serve as the Risk Manager for this project.

## **RISK IDENTIFICATION**

Risk identification will involve the project team, appropriate stakeholders, and will include an evaluation of environmental factors, organizational culture and the project management plan including the project scope. Careful attention will be given to the project deliverables, assumptions, constraints, WBS, cost/effort estimates, resource plan, and other key project documents.

A Risk Management Log will be generated and updated as needed and will be stored electronically in the project library located on GitHub and Google Drive.

| **Category** | **Risk** |
| --- | --- |
| Technical | * Database overloaded * External attacks on server * Loss of data * Inadequacy of technical personnel |
| Project Management | * Little risk awareness * Changes in objectives/expectations that require major design rework proposed * Time required to develop the project is underestimated * Rate of repair of defects is overestimated |
| Resource Management | * Estimated resources budget insufficient to complete the project * Inadequate resources due to reduction or overloading |
| Political | * Legal and bureaucratic obstructions |
| Project Team | * Absence of key figure during critical time periods * Poor team communication with upper management and/or within the team |

## **RISK ANALYSIS**

All risks identified will be assessed to identify the range of possible project outcomes. Qualification will be used to determine which risks are the top risks to pursue and respond to and which risks can be ignored.

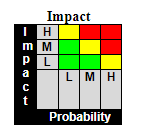
| **Risk** | **Probability** | **Severity** | **Impact** |
| --- | --- | --- | --- |
| Database overloaded | Medium | Medium | * Slow fetching times * Loss of customers |
| External attacks on server | Low | High | * Disclosure of confidential information * Failure of backend |
| Loss of data | Low | Medium | * Productivity disruption * Disclosure of confidential Information * Loss of development time due to redoing work |
| Little risk awareness | Medium | Medium | * Overlook risks * Slow response to incidents |
| Changes in objectives/expectations that require major design rework proposed | Low | High | * Waste of time and effort * Loss of development time |
| Time required to development the project is underestimated | Medium | High | * Unexpected costs in increasing project timeline/outsourcing development of components/increasing team size |
| Rate of repair of defects is overestimated | Medium | Medium | * Extra development time required * May affect project timeline |
| Estimated resources budget insufficient to to complete the project | Medium | High | * Project may have to be abandoned * Project may have to be scaled down * Additional resources will have to be obtained |
| Inadequate resources due to reduction or overloading | Low | Medium | * Unexpected costs in increasing project timeline/outsourcing development of components/increasing team size |
| Legal and bureaucratic obstruction | Low | High | * Unexpected costs in increasing project timeline/outsourcing development of components/increasing team size to meet government regulations * Potential scrapping of project due to changes in economic viability |
| Inadequacy of technical personnel | Medium | High | * Poor implementation leading to more man hours required * Mistakes made that results in downtime |
| Absence of key figure during critical time periods | Medium | High | * Lack of guidance/expertise causing slowdown or halting of development |
| Poor team communication with upper management, client and/or within the team | Medium | High | * Low team motivation * Ill will of team towards client/management |

### **Qualitative Risk Analysis**

The probability and impact of occurrence for each identified risk will be assessed by the project manager, with input from the project team using the following approach:

**Probability**

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



* 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

Risks that fall within the RED and YELLOW zones will have risk response planning which may include both a risk mitigation and a risk contingency plan.

### **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.

## **RISK RESPONSE PLANNING**

Each major risk (those falling in the Red & Yellow zones) will be assigned to a project team member for monitoring purposes to ensure that the risk will not “fall through the cracks”.

For each major risk, one of the following approaches will be selected to address it:

* **Avoid** – eliminate the threat by eliminating the cause
* **Mitigate** – Identify ways to reduce the probability or the impact of the risk
* **Accept** – Nothing will be done
* **Transfer** – Make another party responsible for the risk (buy insurance, outsourcing, etc.)

| **Risk** | **Approach** | **Strategy** |
| --- | --- | --- |
| Database Performance | Mitigate | * Use server load prediction to requisition more server space before expected high load situations based on historical data. For sudden spikes in user activity more server space can be obtained if needed |
| External attacks on server | Transfer | * Any downtime or breach of servers will be referred to Firebase’s SLA |
| Loss of data | Mitigate | * Ensure that there are at least 3 copies of all data with 1 copy off-site * Ensure legacy versions of the product are kept * Ensure that all legacy data be kept for at least 1 year |
| Little risk awareness | Avoid | * Proactively identify key risks * Communicate the risks such that the team and upper management are aware of the risks and its consequences * Risk assessment should involve all team members to ensure awareness and totality of risk assessment measures |
| Requirement changes | Avoid/Mitigate | * Minimise requirements by reviewing and validating requirements. * Minimise impact by using change management log * Access requirements change impact through the derivation of traceability information and communicate the implications of changes * IV&V |
| Development time underestimation | Avoid | * Add risk buffers and constant cross-review of task requirements |
| Rate of repair of defects is overestimated | Mitigate | * Replace potentially defective components with bought-in components with known reliability * Ensure that hot or cold spares are available for essential equipment * Follow defect management accordingly |
| Insufficient resources allocation | Mitigate | * Prepare a briefing document for senior management and conduct a briefing to ensure that sufficient resources are allocated |
| Government regulations | Mitigate | * Ensure all policies are in line with industry and be prepared to pivot in response on upcoming changes in regulations |
| Inadequacy of technical personnel | Avoid | * Ensure technical personnel are properly trained and skillset is up to date by sending them for refresher courses |
| Absence of key figure during critical time periods | Mitigate | * Organise team to ensure increased overlap of work roles between team members to encourage cross understanding of domain areas and to ensure that work is able to continue regardless. * Ensure there is a proper chain of command in place to provide smooth succession in the event of personnel loss. |
| Poor team communication with upper management, client and/or within the team | Avoid | * Recruit an experienced and capable project manager * Ensure that the team is involved with decisions that affect the company |

For each risk that will be mitigated, the project team will identify ways to prevent the risk from occurring or reduce its impact or probability of occurring. This may include prototyping, adding tasks to the project schedule, adding resources, etc. For each major risk that is to be mitigated or that is accepted, a course of action will be outlined for the event that the risk does materialize in order to minimize its impact.

## **RISK MONITORING, CONTROLLING, AND REPORTING**

The level of risk on a project will be tracked, monitored and reported throughout the project lifecycle.

A “Top 10 Risks List” will be maintained by the project team and will be reported as a component of the project status reporting process for this project. A standard operating procedure (SOP) document should be released for steps the team should take to mitigate select risks.

Every quarter there should be a risk assessment done for new potential risks and risks that have already been identified should be reassessed for changes in likelihood.

All project change requests will be analyzed for their possible impact to the project risks.

Management will be notified of important changes to risk status as a component to the Executive Project Status Report.

# **TOOLS AND PRACTICES**

A Risk Log will be maintained by the project manager and will be reviewed as a standing agenda item for project team meetings.RISK MANAGEMENT PLAN APPROVAL

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

| Signature: |  | Date: | 12/10/2020 |
| --- | --- | --- | --- |
| Print Name: | Ma Xiao |  |  |
| Title: |  |  |  |
| Role: | Project Manager |  |  |

**APPENDIX A: KEY TERMS**

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

| **Term** | **Definition** |
| --- | --- |
| Budget | The approved estimate for the project or any work breakdown structure component or any schedule activity. |
| Change Management Log | A tool used by project teams to document and track the resolution of change requests. |
| Contingency Plan | A documented, organised, planned and coordinated course of action to be followed if an identified risk escalates into a project issue. |
| Deliverable | Any unique and verifiable product, result, or capability to perform a service that must be produced to complete a process, phase or project. |
| Defect | An imperfect or deficiency in a project component where that component does not meet its requirements or specifications and needs to be either repaired or replaced. |
| Defect Management | The defect management process establishes an orderly and effective procedure that tracks the submission, coordination, review, evaluation, categorization and resolution of defects for release to the baseline configuration. |
| IV&V | IV&V stands for Independent Verification and Validation - a process employing rigorous methodologies for evaluating the correctness and quality of the product, conducted by personnel not directly engaged in the development. |
| Legacy | Any document or version that is no longer in active use |
| Product | An artifact that is produced, is quantifiable, and can be either an end item in itself or a component item. |
| Project Management | The application of knowledge, skills, tools and techniques to project activities to meet the project requirements. |
| Project Management Plan | A formal approved document that defines the overall plan for how the project will be executed, monitored, and controlled |
| Quantitative Analysis | Analyzes the effect of those risk events and assigns a numerical rating to those risks, allows a quantitative approach to decision-making when uncertainty arises. |
| Qualitative Analysis | It assesses priority identified by using the probability of occurring, corresponding impact on project objectives, as well as other factors such as the time frame and risk tolerance of the project constraints of cost, schedule, scope, and quality. |
| SOP | SOP stands for Standard Operating Procedure. A list of actions to take in response to an event |
| SLA | SLA stands for Service Level Agreement. Defines the level of service expected by a customer from a supplier, laying out the metrics by which that service is measured, and the remedies or penalties. |
| Risk | A risk is defined as an uncertain event or condition that, if it occurs, has a positive or negative effect on a project's objectives. |
| Risk Management | An approach for addressing the risks including identification, analysis, prioritization, and control of risks. |
| Risk Response Planning | The process of developing options and actions to enhance opportunities and to reduce threats to project objectives. Risk response actions may include mitigation, contingency, transfer, avoidance, and acceptance. |
| Risk Log | A tool used by project teams to document and to monitor the resolution of issues. |
| Traceability | The degree to which a relationship can be established between two or more products of the development process. |