Risk Management

Contents

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 Automated Note-Taking and Summarisation Solution 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

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.

The process of responding to project risk involves several key steps, outlined as follows:

- **Planning Risk Management:** Define how risk management activities will be conducted, including methodology, roles, budgeting, and timing.
- **Identifying Risks:** Systematically identify potential risks to the project using techniques like brainstorming, checklists, and interviews.
- **Performing Qualitative Risk Analysis:** Prioritize risks based on their likelihood and potential impact on project objectives through qualitative assessment.
- **Performing Quantitative Risk Analysis:** Numerically analyze the effect of risks on project objectives using methods such as Monte Carlo simulation.
- **Planning Risk Responses:** Develop strategies for mitigating, avoiding, transferring, or accepting risks, and establish plans for both threats and opportunities.
- **Controlling Risk:** Implement risk response plans, track and monitor risks, identify new risks, and evaluate the effectiveness of risk management processes.

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.

Key risks include:

1. **Accuracy and Completeness:** Potential inaccuracies in automated transcripts may arise due to limitations in speech-to-text technologies, especially with low-quality audio or diverse accents.
2. **Contextual Understanding:** There might be challenges in ensuring that AI-generated summaries accurately capture the nuanced content of lectures, considering the complexity of academic material.
3. **Scalability and Efficiency:** Technical and operational issues could impact the scalability of the automated system, affecting its ability to accommodate the vast number of lectures and courses at NTU.
4. **User Adoption and Acceptance:** Resistance from students and faculty in transitioning from traditional note-taking methods to an automated system is a possible risk that could affect the success of the implementation.

A Risk Management Log will be maintained and updated regularly, stored in a secure, centralized digital repository accessible to the project 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.

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 of Occurrence

- **High** – Greater than 70% likelihood of occurrence.
- **Medium** – Between 30% and 70% likelihood of occurrence.
- **Low** – Less than 30% likelihood of occurrence.

Potential Impact on Project

The impact of each risk will be evaluated based on its potential effect on project cost, schedule, or performance. The impact is categorized as follows:

- **High Impact (H)** – Risk that has the potential to significantly disrupt project cost, schedule, or performance.
- **Medium Impact (M)** – Risk that may cause moderate disruption to project cost, schedule, or performance.
- **Low Impact (L)** – Risk that is unlikely to significantly affect project cost, schedule, or performance.

Risk Matrix

The following matrix visualizes the combination of probability and impact, assisting in the prioritization of risks:

Impact/Probability	High	Medium	Low
High Impact	Critical (Act immediately)	High (Prioritize)	Moderate (Keep under review)
Medium Impact	High (Prioritize)	Moderate (Keep under review)	Low (Monitor)
Low Impact	Moderate (Keep under review)	Low (Monitor)	Minimal (Monitor occasionally)

Risks identified in the 'Critical' and 'High' categories will be prioritized for detailed risk response planning. Below are the risks that we have identified:

Component	Risk Description	Impact/Probability	Classification
Automated Note-Taking Process	API Dependency for Transcription might limit accuracy for diverse accents.	High/Medium	High (Prioritize)
	Processing time might exceed 10 minutes for a 1-hour lecture in some cases.	Medium/Medium	Moderate (Keep under review)
	Inaccurate transcription due to background noise or poor audio quality.	High/High	Critical (Act immediately)
Database Utilization for Transcript Management	Upvote/Downvote system may not accurately reflect transcript quality.	Medium/Low	Low (Monitor)
	Manual metadata entry could introduce human error and inefficiencies.	High/Medium	High (Prioritize)
	System performance issues with search functionality.	Medium/Medium	Moderate (Keep under review)
Summary Generation with Generative AI	Summarization effectiveness might vary with complex lecture content.	Medium/Medium	Moderate (Keep under review)
	Difficulty in integrating optional slides for added context.	Low/Medium	Low (Monitor)
	Inaccuracies in summaries due to generative AI limitations.	High/Medium	High (Prioritize)
Interactive Chatbots for Enhanced Learning	Chatbots might provide inaccurate or irrelevant information.	Medium/High	High (Prioritize)
	Contextual memory and conversation history may not work seamlessly.	Medium/Medium	Moderate (Keep under review)

Quantitative Risk Analysis

Risk Event Description	Estimated Impact on Project Activities	Numerical Rating	Notes
API Dependency for Transcription might limit accuracy for diverse accents.	Could lead to significant rework of transcripts, affecting project timelines.	8	High priority due to impact on core functionality.
Processing time might exceed 10 minutes for a 1-hour lecture.	Delays in transcript availability could reduce user satisfaction.	6	Medium impact, workaround possible through notification systems.
Inaccurate transcription due to background noise or poor audio quality.	High rework rates and decreased user trust in the system.	9	Critical; consider noise-cancellation technologies.
Upvote/Downvote system may not accurately reflect transcript quality.	Misleading quality indicators could result in poor content curation.	5	Lower impact, but requires monitoring and potential adjustments.
Manual metadata entry could introduce human error.	Inaccuracies in search functionality, affecting user experience.	7	Significant due to reliance on search for content retrieval.
System performance issues with search functionality.	Frustration and potential loss of users due to slow response times.	6	Moderate; performance optimization is essential.
Summarization effectiveness might vary with complex lecture content.	Summaries may not meet user expectations, affecting study efficiency.	7	High; core feature that influences user retention.
Difficulty in integrating optional slides for added context.	Reduced summary quality and relevance, impacting user satisfaction.	4	Lower priority, but important for advanced functionality.
Inaccuracies in summaries due to generative AI limitations.	Could lead to misinformation and reduced credibility of the system.	8	High; accuracy is critical for user trust.
Chatbots might provide inaccurate or irrelevant information.	Decreased user engagement and trust in the platform.	7	High; directly affects user interaction and satisfaction.
Contextual memory and conversation history may not work seamlessly.	Impacts user experience and perceived intelligence of the system.	5	Moderate; important for user satisfaction but not critical.

Risk Response Planning

For each identified high-priority risk, a response strategy will be selected:

- **Avoid** – Implement measures to prevent the risk from occurring.
- **Mitigate** – Develop actions to reduce the impact or likelihood of the risk.
- **Accept** – Acknowledge the risk and decide to proceed with the project despite it.
- **Transfer** – Shift the responsibility of the risk to a third party, where feasible.

Specific action plans will be developed for mitigated or accepted risks, outlining steps to address them should they materialize.

Risk Event	Selected Response Strategy	Specific Action Plans	Notes
API Dependency for Transcription might limit accuracy for diverse accents.	Mitigate	Implement additional accent training modules for the speech-to-text engine. Conduct regular accuracy checks and updates.	Considering backup transcription services for critical cases.
Processing time might exceed 10 minutes for a 1-hour lecture.	Accept	Inform users of potential delays during peak hours. Explore options for asynchronous content delivery.	Monitoring processing times to identify improvement opportunities.
Inaccurate transcription due to background noise or poor audio quality.	Mitigate	Integrate advanced noise-cancellation technologies. Provide guidelines for optimal audio recording to users.	Priority due to direct impact on transcript quality.
Manual metadata entry could introduce human error.	Mitigate	Automate metadata extraction where possible. Implement a review system for manual entries.	Reducing reliance on manual processes to enhance efficiency and accuracy.
Upvote/Downvote system may not accurately reflect transcript quality.	Accept	Regularly review upvote/downvote trends and adjust algorithms as necessary. Encourage user engagement for more representative feedback.	Acceptance due to manageable impact and potential for iterative improvement.
System performance issues with search functionality.	Mitigate	Optimize database queries and server performance. Consider scaling up infrastructure to handle peak loads.	Essential for maintaining a positive user experience.
Summarization effectiveness might vary with complex lecture content.	Mitigate	Continuously train the AI on diverse content. Allow user feedback to inform adjustments to the summarization algorithms.	Ongoing improvement critical for core feature functionality.
Difficulty in integrating optional slides for added context.	Accept	Provide clear guidelines for slide uploads. Work on incremental improvements to slide integration capabilities.	Balancing development effort with feature demand.
Chatbots might provide inaccurate or irrelevant information.	Mitigate	Enhance AI training datasets and improve natural language processing capabilities. Establish a feedback loop for user-reported inaccuracies.	Ensuring chatbot reliability to support user engagement.
Contextual memory and conversation history may not work seamlessly.	Mitigate	Implement more sophisticated memory management and user session tracking. Test and refine based on user interactions.	Enhancing the personalization and effectiveness of chatbot interactions.

Risk Monitoring, Controlling, and Reporting

The project team will continuously monitor the risk landscape, tracking the status of each identified risk and the effectiveness of implemented response strategies. Regular updates on risk management activities will be included in project status reports, ensuring transparency and proactive management of potential issues.

Tools and Practices

A comprehensive digital Risk Management Log will be utilized for documenting and tracking all risk management activities. The log will be reviewed regularly during project team meetings to ensure timely updates and adjustments to risk strategies as needed.
