National Taiwan University

Software Engineering Course in AY111

Project execution plan

Multifunctional Verbatim Management System

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Group 5

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Version Change History

Vers	Responsible	Date	Change Item Description	Reviewer	Date
0.2	周語涵	10/05/22	Write the content of each chapter of the PEP	All members	10/10/22

1. About the Project

1-1. Origin of the project

People often need to participate in a variety of meetings, some of which have the need to record the content of the meeting. Therefore, audio recordings and verbatim transcripts have become an integral part of the meeting.

Our team members observed that there is no software available to automatically generate verbatim transcripts that meets the needs of the general public.

In this project, we have developed a software for verbatim transcripts. In addition to the functions it should have, it can also automatically translate, automatically summarize, and automatically capture keywords. By realizing various functions, it can meet the needs of modern people.

This project is developed by students of National Taiwan University. The content of the project mainly includes page design, functional algorithm design, back-end management interface and other projects.

2. Project Lifecycle and Work Distribution

Effort															
Percentage Confidence of Inteval Best to Worst	80%														
Devisor	2.56														
Total VAR	305.12														
Total STD	17.47														
Total Expected Effort (50%)	409.7														
Percentage Condidente of Total Expected Effort	75%														
Total Expected Effort (75%)	421.4														
Percentage Condidente of Total Expected Effort	2%	10%	16%	20%	25%	30%	40%	50%	60%	70%	75%	80%	84%	90%	98%
Effort Estimate	373.8	387.3	392.3	395.0	397.9	400.5	405.2	409.7	414.1	418.8	421.4	424.4	427.0	432.1	445.5

WBS														
Deadline	Item	Item branch	Task	Best Working Hours	Most Likely	Worst	Expected (50%)	STD	VAR	Days	Person in Charge	Start Date	Complete %	Actual
	Total			181.5	306.5	429.5								
	Ideas	Survey	Existing project comparison	2.0	5.0	5.0	4.5	1.17	1.37		周語涵	9/20/22		
			Survey report	1.5	3.0	4.0	2.9	0.98	0.95		周語涵			
		Requirements Analysis	Extract requirements	2.0	4.0	5.5	3.9	1.37	1.86		廖盛弘	10/12/22		
			Set goals	1.5	2.5	4.0	2.6	0.98	0.95		廖盛弘			
			Define character	2.0	3.0	4.5	3.1	0.98	0.95		廖盛弘			
			Use cases	4.5	7.0	8.5	6.8	1.56	2.44		廖盛弘			

			Define system requirements	3.0	4.5	7.0	4.7	1.56	2.44		廖盛弘			
			Write requirement document	3.0	5.5	7.5	5.4	1.76	3.08		廖盛弘			
10/25			milestone											
		Development of Project Plans	Introduction	1.0	2.5	8.0	3.2	2.73	7.46		周語涵			
			Lifecycle	2.5	3.5	4.5	3.5	0.78	0.61		黃彥鈞、李學翰、周語涵			
			Work breakdown structure	3.0	4.5	6.5	4.6	1.37	1.86		黃彥鈞、李學翰、周語涵	9/28/22		
10/4			Schedule	1.5	2.5	3.5	2.5	0.78	0.61		黃彥鈞、李學翰、周語涵			
			Resource	6.0	10.5	14.0	10.3	3.12	9.74		羅費南			
			required knowledge and skill	4.0	6.0	8.0	6.0	1.56	2.44		羅費南			
			training plan	2.0	4.5	6.0	4.3	1.56	2.44		羅費南			
10/11			milestone											
	Risk Management and Project Control	Risk	Risk Analysis	6.5	12.5	16.0	12.1	3.71	13.74		吳詩昀			
			risk identification	2.0	4.0	5.0	3.8	1.17	1.37		吳詩昀			
			risk assessment	3.0	5.0	7.0	5.0	1.56	2.44		吳詩昀			
			risk classification	1.5	3.5	4.0	3.3	0.98	0.95		吳詩昀			
			Risk control	9.0	14.5	18.0	14.2	3.51	12.33		廖盛弘	9/28/22		
			risk mitigation	2.5	4.5	6.0	4.4	1.37	1.86		廖盛弘			
			risk planning	4.5	5.5	7.0	5.6	0.98	0.95		廖盛弘			
			risk monitoring	2.0	4.5	5.0	4.2	1.17	1.37		廖盛弘			
		Project Monitoring and Control	Project supervision	5.5	8.5	11.0	8.4	2.15	4.60		廖盛弘			

			data collection	4.0	6.0	7.0	5.8	1.17	1.37		廖盛弘			
			earned value management	1.5	2.5	4.0	2.6	0.98	0.95		廖盛弘			
			Project control	3.0	7.0	9.0	6.7	2.34	5.48		廖盛弘			
			formal control	1.5	3.5	4.5	3.3	1.17	1.37					
			informal control	1.5	3.5	4.5	3.3	1.17	1.37					
10/11			milestone											
	Website Design	Architecture Design	System architecture selection	2.5	4.0	5.5	4.0	1.17	1.37		李學翰、周語涵			
			Design methods and tools	3.0	4.5	5.5	4.4	0.98	0.95		李學翰、周語涵			
			System segmentation	16.0	24.0	32.0	24.0	6.24	38.97		李學翰、周語涵			
			server	4.0	6.0	8.0	6.0	1.56	2.44		李學翰、周語涵			
			client	3.5	5.0	6.5	5.0	1.17	1.37		李學翰、周語涵			
			database	3.5	5.0	6.5	5.0	1.17	1.37		李學翰、周語涵			
			connector	3.0	4.5	6.0	4.5	1.17	1.37		李學翰、周語涵	10/12/22		
			packet	2.0	3.5	5.0	3.5	1.17	1.37		李學翰、周語涵			
			Subsystem interaction mode	6.0	10.0	13.0	9.8	2.73	7.46		李學翰、周語涵			
			object mode	2.0	3.5	4.5	3.4	0.98	0.95		李學翰、周語涵			
			control mode	2.0	3.5	4.5	3.4	0.98	0.95		李學翰、周語涵			
			flowchart	2.0	3.0	4.0	3.0	0.78	0.61		李學翰、周語涵			
			System interface design	4.0	6.0	8.0	6.0	1.56	2.44		李學翰、周語涵			
		Component Design	Component function	4.0	6.0	9.0	6.2	1.95	3.81		李學翰、周語涵			

			Input and Output	3.5	5.5	7.5	5.5	1.56	2.44		李學翰、周語涵			
			Algorithm requirements	4.0	6.5	9.5	6.6	2.15	4.60		李學翰、周語涵			
		User Interface Design	Screen image	2.0	4.5	7.0	4.5	1.95	3.81		李學翰、周語涵			
			Object and Actions	4.5	7.0	9.5	7.0	1.95	3.81		李學翰、周語涵			
			Data structure design	3.0	5.5	7.5	5.4	1.76	3.08		李學翰、周語涵			
			Database design	2.5	4.5	6.5	4.5	1.56	2.44		李學翰、周語涵			
		Algorithm Design	Input and Output	2.0	4.0	5.5	3.9	1.37	1.86		李學翰、周語涵			
			Flowchart	1.5	3.5	5.0	3.4	1.37	1.86		李學翰、周語涵			
11/8			milestone											
	Development and Implement ation	Establishment of Development Process	Individual development process	3.5	5.5	8.0	5.6	1.76	3.08		ALL			
			Collaborative development process	3.5	5.5	8.0	5.6	1.76	3.08		ALL			
		Implementation	Server	7.0	10.0	15.0	10.3	3.12	9.74		ALL			
			Client	6.0	9.0	14.0	9.3	3.12	9.74		ALL			
			Database	5.5	9.0	13.5	9.2	3.12	9.74		ALL			
			Connector	4.0	8.5	13.0	8.5	3.51	12.33		ALL	10/19/22		
			Packet	3.0	5.0	7.5	5.1	1.76	3.08		ALL			
		Website Erection	Rent a host	3.0	5.0	7.5	5.1	1.76	3.08		ALL			
			Buy a website	2.0	4.5	6.5	4.4	1.76	3.08		ALL			
			Material preparation and visual design	2.5	3.5	4.5	3.5	0.78	0.61		ALL			
			Erect	2.5	4.0	6.0	4.1	1.37	1.86		ALL			
			Website analysis and indexing	2.0	3.5	5.5	3.6	1.37	1.86		ALL			
12/6			milestone											

	Website Testing and Maintenance	Testing	Write a test plan document	5.0	8.0	11.0	8.0	2.34	5.48		吳詩昀			
			Software testing	10.0	18.0	26.0	18.0	6.24	38.97		吳詩昀			
			preparation	5.0	8.0	11.0	8.0	2.34	5.48		吳詩昀	11/08/22		
			execution	2.0	4.5	7.0	4.5	1.95	3.81		吳詩昀			
			evaluation and control	3.0	5.5	8.0	5.5	1.95	3.81		吳詩昀			
		Maintenance	Write a maintenance plan document	4.0	7.0	9.0	6.8	1.95	3.81		吳詩昀			
			Execution	2.0	4.5	7.0	4.5	1.95	3.81		吳詩昀			
11/22			milestone											

3. Milestone

Milestone	Date	Content
M1	10/10/22	PEP document submission
M2	10/24/22	SRS document submission
M3	11/07/22	SDD document submission
M4	11/14/22	Module acceptance
M5	11/21/22	System source code submission
M5	11/28/22	Test document submission
M6	12/05/22	Acceptance Test

4. Project-related participating members

4.1 List of relevant participating members

Table 4-1: List of participating members

Name	Job title	Role
李允中	NTU CSIE Professor	Senior Manager
周語涵	NTU CE Master’s Student	Project Manager
吳詩昀	NTU EE Bachelor Student	Team Member
黃彥鈞	NTU EE Bachelor Student	Team Member
羅費南	NTU CSIE Master’s Student	Team Member
廖盛弘	NTU CSIE Master’s Student	Team Member
李學翰	NTU GINM Master’s Student	Team Member

4.2 Development tools and resources

This project, we’re expecting to use the following development tools:

- Hardware resources:
  - Personal computers * 6
  - Personal internet connection * 6
- Software resources:
  - Trello 2022.12
  - VSCode 1.72
  - Docker Desktop 3.6.0

4.3 Knowledge and Skill Requirements

Table 4-2: List of relevant knowledge and skills

Professional knowledge and skills	No. of people	Expected trainees	Remarks
Java programming	6	Fiona	
HTML / CSS / Javascript Web Programming	2	None	Members of this project have relevant experience
JSP / Servlet	6	None	Members of this project have relevant experience
Database programming	1	None	Members of this project have relevant experience

4.4 Training planner

Table 4-3: List of areas that member's need training in

Training Area	Participants	Method	Training time
Java programming	Fiona	Self-study	2022.10.04 ~ 10.28
		Self-study	

5. Project Risk Management

Potential problems that can hinder project progress are risks. The occurrence of problems can cause a major crisis for the project, so preventive work must be done before the crisis occurs to minimize the risk.

5.1 Risk Analysis

Risk analysis consists of three steps: risk identification, risk assessment, and risk classification. Our degrees of probability and impact are defined as follow:

Table 5.1 Definition of possibility and impact degrees for risk assessment

Probability		Impact	
Degree	Description	Degree	Description
1	Very Unlikely (10%)	1	Negligible
2	Not likely (30%)	2	Minor
3	Possible (50%)	3	Moderate
4	Probable (70%)	4	Major
5	Very Likely (90%)	5	Catastrophic

Therefore, the level of risk can be represented by the multiple of probability and impact as follow:

$$Risk = Probability \times Impact$$

Here we refer to Taxonomy-Based Risk Identification to identify and analyze the risks of this project. Each risk is given a code and a degree of risk. The higher the level, the higher the urgency. Our group has discussed mitigating actions for every risk. However, there are costs for such actions, and the trade-off should be taken into consideration when determining the priority for risk monitoring. Hence, we quantified the costs as 5 levels and got the reduced ratio of for the mitigating actions. The function for reduced ratio is as follow:

$$Reduced\ Ratio = \frac{Risk\ before\ action - Risk\ after\ action}{Cost}$$

The following is the list of risks for our project with analysis and mitigating actions for each item.

Table 5.2 Risk analysis list

#	Risk Item	Risk			Mitigating Actions	Cost	Residual Risk			Reduce Ratio	Priority
		Prob.	Impact	Level			Prob.	Impact	Level		
A. Product Engineering											
A-1	Lack of completeness and clarity of requirements	4	5	20	Apply **Requirements Engineering**: • Elicitation • Analysis • Specification • Validation	2	2	4	8	6	★
A-2	Requirements are not feasible	3	5	15	1. Apply **requirements engineering** 2. Include experts in the validation of requirements 3. Expand team members' knowledge in related domain	4	1	3	3	3	★
A-3	The design and/or implementation are difficult to achieve	2	4	8	1. Form a **software design documentation (SDD)** 2. Expand team members' knowledge in related domain	4	1	3	3	1.25	
A-4	The design of interfaces are not well defined and controlled	3	3	9	1. Apply change control process 2. All interface should be well documented 3. Form a **software design documentation (SDD)**	3	2	2	4	1.67	
A-5	The design doesn't consider constraints on the target hardware	3	4	12	1. Be familiar with the target hardware 2. Form a **software design documentation (SDD)**	3	2	4	8	1.33	
A-6	Specified level and time for unit testing are not adequate	3	3	9	Unit tests and integration tests should be conducted before merging PR	3	1	2	2	2.33	
B. Development Environment											
B-1	Lack of formal, controlled plans for all development activities	2	5	10	Set formal **development process** for following activities: • Requirements analysis • Design • Code • Integration and test • Installation • Configuration management	5	1	2	2	1.6	
B-2	The software development process is not well enforced and monitored	3	4	12	1. Each member should be familiar with the dev process 2. Each activity should require **formal documentation** 3. Find someone responsible for the monitor	4	1	3	3	2.25	
B-3	The planning is not timely, technical leads included, or contingency planning done	4	4	16	1. Re-planning should be done when disruption occur 2. Include **contingency plans** when planning	3	3	3	9	2.33	★
B-4	The roles and reporting relationships are unclear	3	2	6	Use **trello** for project management and task assignment	2	1	2	2	2	
B-5	Insufficient capacity of project personnel	4	4	16	1. Make **training plans** for each member 2. Determine appropriate job distribution	4	3	4	12	1	★
B-6	Poor communication of technical information among peers	3	2	6	A more frequent meeting for progress report and problem report	4	1	2	2	1	
C. Program Constraint											
C-1	The schedule is inadequate or unstable	5	3	15	1. Consult with experts and refer to existing project 2. Use **trello** for schedule record and monitor	3	3	3	9	2	★
C-2	The staff is inexperienced, lacking domain knowledge, lacking skills, or understaffed	3	4	12	1. Make **training plans** for each member 2. Determine appropriate job distribution	4	2	4	8	1	

5.2 Risk Monitoring

- Monitored by color level
  - Take A-1,A-2…

	1 Negligible	2 Minor	3 Moderate	4 Major	5 Catastrophic
5 Very Likely	5	10	15	20	25
		B-1	A-2 C-1	A-1	
4 Probable	4	8	12	16	20
		A-3	B-2 C-2	B-3 B-5	
3 Possible	3	6	9	12	15
		B-4 B-6	A-4 A-6	A-5	
2 Not likely	2	4	6	8	10
1 Very Unlikely	1	2	3	4	5

Reference: This is a reference code which helps identify a specific risk from the risk register and the priority risk table (see sections seven and eight above)
Risk identified and likely impact Provide a brief summary of the risk that you have identified in this section and the likely impact on the organization's objectives if the risk occurs
Summary of recommended response Summarize the organization's approach to managing the risk. For example, are you likely to put additional management controls in place to minimize the likelihood that the risk will occur? Would you transfer the risk by going into partnership or by taking out additional insurance (where appropriate)
Action plan Describe the specific actions that will be taken to manage the risk
Resource requirement Describe the resources needed to succeed in the action plan. Resources may include staff time as well as financial input
Responsibility Say who has been delegated responsibility to manage this risk
Timing Say and how often this risk will be treated
Reporting and monitoring required How often will the treatment plan be monitored and who by? When will progress on managing this risk be reported to the board or risk committee?
Compiled by: Date
Reviewed by: Date

Topic: Lack of completeness and clarity of requirements (A-1)
Risk identified and likely impact may require re-work to meet the customer intent for a requirement.
Summary of recommended response
Action plan: enhance employee ability.
Resource requirement
Responsibility one employee
Timing 2hr - 1hr /per week
Reporting and monitoring required
Compiled by: Date
Reviewed by: Date

Topic: Requirements are not feasible (A-2)
Risk identified and likely impact Be a risk of underestimating the difficulty of implementation and committing to an inadequate budget and schedule.
Summary of recommended response
Action plan:
Resource requirement computer one classroom
Responsibility one employee
Timing 2hr - 1hr /per week
Reporting and monitoring required
Compiled by: Date
Reviewed by: Date

Topic: The schedule is inadequate or unstable (C-1)
Risk identified and likely impact Be a risk of underestimating the Deadline and the ideal milestione.
Summary of recommended response
Action plan:
Resource requirement computer one classroom
Responsibility one employee
Timing 2hr - 1hr /per week
Reporting and monitoring required
Compiled by: Date
Reviewed by: Date

Topic: The planning is not timely, technical leads included, or contingency planning done (B-3)	
Risk identified and likely impact	
Summary of recommended response	
Action plan:	
Resource requirement computer one classroom	
Responsibility one employee	
Timing 1hr - 2 hr /per week	
Reporting and monitoring required	
Compiled by:	Date
Reviewed by:	Date

Topic: Insufficient capacity of project personnel (B-5)	
Risk identified and likely impact	
Summary of recommended response	
Action plan:	
Resource requirement computer one classroom	
Responsibility one employee	
Timing 1hr - 2 hr /per week	
Reporting and monitoring required	
Compiled by:	Date
Reviewed by:	Date