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AMERICAN INTERNATIONAL UNIVERSITY-BANGLADESH

408/1, Kuratoli, Khilkhet, Dhaka 1229, Bangladesh

Assignment Title:Software Engineering Final Project Report				
Assignment No:		Date of Submission:4 December 2021		
Course Title:Software Engineering				
Course Code:		Section:D		
Semester:Fall	2021-2022	Course Teacher:Farzana Bente Alam		

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Admission Test Management System GROUP 7

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Project Proposal

SOFTWARE ENGINEERING.

SECTION-D

LABWORK-1

GROUP-7

Introduction

In this world of modern technology, where we can find everything just by searching through the internet, life is simple because of this magical discovery. But we want things to be easier, quicker.

In Bangladesh, every year millions of students enroll in university admission test exams. There are no applications that contain all the information about universities. Students have to manually search for the exam schedules, seat plans, dates, requirements and every other important information that will help them for their upcoming life event.

For our project we propose the development of a smart admission test exam planner application that will include every public, private, national universities across the country. This application will provide the user with an optimized exam schedule, location of the universities, requirements for each group, user can set reminder, required GPA/grades, where the exam will be taken, distances, travel modes, if there are any clash exams and many more.

Objective

- To provide an easy to use application that acts like a personal assistant by providing user with an optimally planned exam schedule.
- Provide flexibility by re-computing an optimized schedule to accommodate change in plans by user.
- Provide access to schedule anytime and anywhere by syncing the university's exam schedule with a central server.
- Optimize schedules taking into account various user constraints as well as other information like location of universities/exam center, exam duration, and travel times depending on mode of transport (driving, cycling, and walking).

Target Customers

- Students- students who finished their HSC/A levels can get all their admission related information from the application also manage information and set reminders.
- Parents- The same targeted student's parent will use the application as they can get all the information in one place.

Application Feature

Requires students/parents to sign in. The user provides their information that will give them a list of universities they are eligible to apply for. After that they can choose for universities, for each choice the system will provide more information regarding the universities, compare universities and give exam schedules that will allow the system to build a schedule and optimize it:

- Event + date
- Start time end time
- Location of the exam hall
- Priority of event on a scale of 1-5 (users can set this)
- Can set reminder
- Clash exams
- Direction/distance of universities/ exam hall from home (user gives home address)



Functional Requirements

1.LOGIN

- 1.1 System must allow users to log into their account by entering their email and password.
- 1.2 System must allow Log in with their google account (if user do not have account)
 - 1.2.1 System must record the user's First name
 - 1.2.2 System must record user's Last name
 - 1.2.3 System must record user's age
 - 1.2.3.1 System must check if age is older than 15, user cannot create account
 - 1.2.4 System must record user's phone number
 - 1.2.5 System must record user's location (will use devices location)

PASSWORD RESET

System must allow Reset password by clicking I forgot my password and receiving a link to their verified email address.

- 2. VERIFICATION
- 2.1 The system must allow users to verify their accounts using their phone number.
- 3. STUDENT INFORMATION
- 3.1. System must allow users to update their student/personal information
 - 3.1.1 System must record user's ssc/o level's student id.
 - 3.1.2 System must record user's institute
 - 3.1.3 System must record user's Curriculum
 - 3.1.4 System must record user's group
 - 3.1.5 System must record user's ssc/o level's result

- 3.1.6 System must record user's passing year
- 3.1.7 System must record user's exam title

4. UNIVERSITY INFORMATION

- 4.1 System must allow users to see the university lists they can apply for.
- 4.2 System must show requirements for each university.
- 4.3 System must allow users to select preferred universities.
- 4.4 System must show schedules/date of exam
- 4.5 System must allow users to see location of exam hall
- 4.6 System must allow users to see the distance between their house and the exam hall of each exam in different schedules
- 4.7 System must allow users to show the list of clash exams

5. BUS TICKET BOOKING

5.1 System must allow users to book bus tickets via shohoj (we can link shohoj's website here)

6. SCHEDULING

- 6.1 System must allow users to set priority level for each universities and exams on a scale of 1-5 (this will help the application to show most to least important exams that will help users)
- 6.2 System must allow users edit, modify given schedules (system gives a schedule using information from users personal/student information and the universities user chose to apply for)
- 6.3 System must allow users to set reminder.

7. CALENDER FOR STUDYING

- 7.1 System must allow users to set calendar FOR STUDYING.
- 7.2 System must allow users to show important subjects according to their chosen admission test exam they want to give.

- 7.3 System must allow users to Choose their weak subjects.
- 7.4 System must allow users to see a schedule for studying according to their weaknesses.
- 7.5 System must allow users to see provided suggestions for each subject, groups, exams.



Design Specification

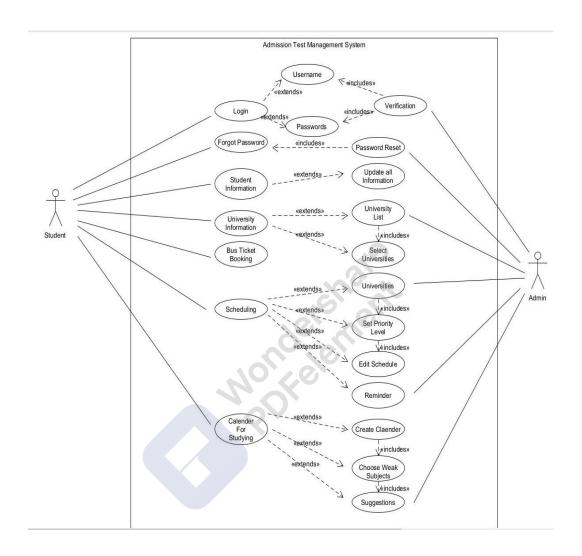


Figure: Use Case Diagram

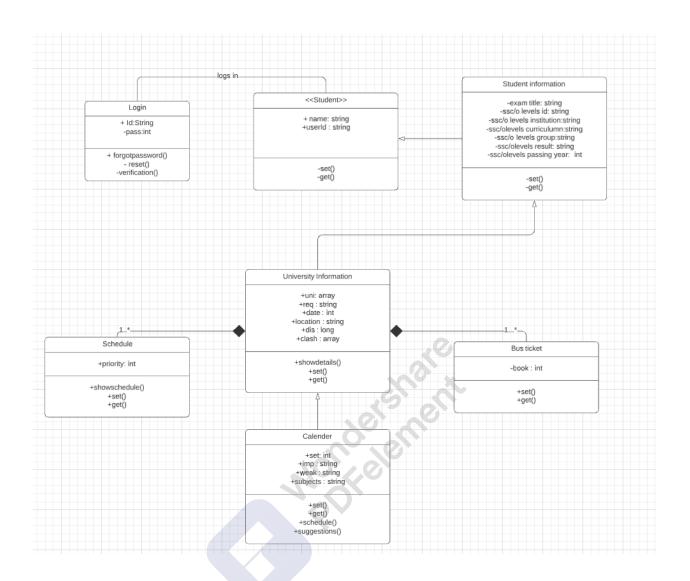


Figure : Class Diagram

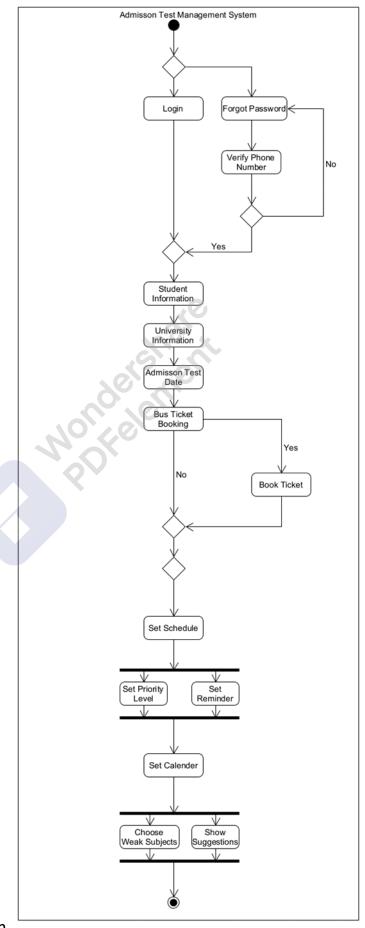
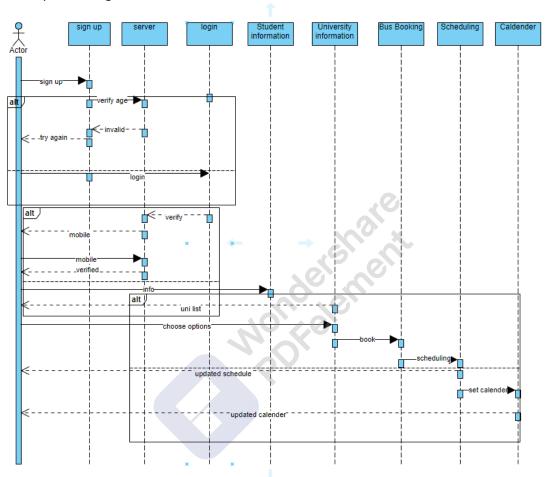


Figure: Activity Diagram

Figure: Sequence Diagram



Selection of Process Model

1. Proposed System Solution

We are choosing Agile Method. Our Project is a mini project with activities that span requirements, analysis, design, implementation and test. Our product is small and can be done with small term. This product is for dynamic Environment. So agile method is good for this product or project.

Amongst Agile methods we are choosing Scrum Method for our project.

2. Presenting Arguments for selected method (Scrum Method)

- 1. Mini project.
- 2. Effective use of time and money.
- 3. We can test during Sprint planning
- 4. Team will get a clear idea on every matter in each daily scrum meetings.
- 5. Sprint review and retrospective will give chances to gain feedbacks and for future upgrades. Where to put efforts, also will get a clear view of each team members efforts.

Presenting Arguments for non-selected methods (why we did not choose other methods)

Waterfall Model –

- Error can be fixed only during the phase
- Testing period comes quite late in the developmental process
- Clients valuable feedback cannot be included with ongoing development phase
- Small changes or errors that arise in the completed software may cause a lot of problems

V Model –

- The V model is very hard to execute compared to other software.
- The design has limited flexibility in terms of its execution. It is overall not suitable to use for building object-oriented software.

The management of the V model is pretty risky and unstable.

Spiral Model –

- o It is not suitable for small projects as it is expensive.
- o Difficulty in time management
- o End of the project may not be known early.

• DSDM -

- Sometimes there are large management overheads
- DSDM doesn't encourage developer creativity
- o Can be impractical for small companies since implementation can be costly

• FDD -

- o FDD cannot be deployed where spectrum is un-paired.
- Though it saves in number of Base Station requirements, hardware costs associated with FDD are higher.

Prototypes –

- This model is costly.
- There is certainty in determining the number of iterations.
- There may increase the complexity of the system.

Extreme Programming –

- Relatively large time investment
- Relatively high costs
- Customer must participate in the process

• Lean Software Development -

- Need Disciplined team members.
- o Team members should have good technical skills.

• Kanban -

- o Kanban cannot be used as an independent tool.
- o Kanban is not suitable for the environments that are dynamic in nature.
- Kanban will become very difficult to apply if too much activities or tasks are interrelated in a system.

3. Roles in the project management activities

- Product Owner
- Scrum Master
- Scrum development team:
 - 1. Business Analyst
 - 2. Database Admin
 - 3. Project Manager
 - 4. Developers
 - 5. Graphic Designer/Architect

Responsibilities of the role in the software development

Initiate

Product Owner:

- Identifies Scrum Master
- Along with the Scrum Master decides development team
- Develops epics and arranges user group meetings
- Refines epics
- Reviews the backlog and develops release planning schedule
- Writes user stories and incorporates them into the Prioritized Product Backlog
- Approves user stories for the sprint

Scrum Master:

- Along with the PO decides dev team
- Helps PO in developing epics

- Helps PO in epic refinement
- Helps PO and dev team with backlog prioritization and determining sprint length

Scrum Development Team:

- Helps Product Owner in developing epics
- Helps Product Owner with backlog prioritization and determining sprint length

Plan and Estimate:

Product Owner:

- Writes user stories and incorporates them into the Prioritized Product Backlog
- Approves user stories for the sprint
- Helps dev team break down the stories into tasks
- Helps the dev team create the effort estimated task list
- Creates the sprint backlog and lists the tasks that need to be completed in the sprint

Scrum Master:

- Estimates the effort required to deliver the product defined in each user story
- Helps dev team break down the stories into tasks
- Helps the dev team create the effort estimated task list
- Helps the PO create sprint backlog

Scrum Development Team:

- Writes user stories
- Along with the Scrum Master estimates the effort for each sprint and
- Creates the effort estimated task list
- Helps the Product Owner create sprint backlog

Implement:

Product Owner:

- Helps dev team if needed
- May or may not attend the meetings
- Updates and maintains the backlog continuously

Scrum Master:

• Guides the dev team

- Arranges and conducts the meetings
- Helps PO to groom the backlog

•

Scrum Development Team:

- Works on creating sprint deliverables
- Attends the meetings and defines any problems or issues faced
- Helps Product Owner to groom the backlog
- Mentions their progress or any issues they may be facing

Review and Retrospect:

Product Owner:

Approves or rejects what the dev team demonstrates

Scrum Master:

- Helps dev team in displaying what it has created
- Meets with dev team to ponder on lessons learnt during the sprint. Documents the recommendations

Scrum Development Team:

- Demonstrates deliverables to Product Owner and stakeholders
- With scrum master retrospect's on sprint and uses the recommendations for the next sprint

Release:

Product Owner:

- Along with other team members ships acceptable deliverables
- Gets together with other team members and identifies the lessons learnt

Scrum Master:

- Along with other team members ships acceptable deliverables
- Gets together with other team members and identifies the lessons learnt

Scrum Development Team:

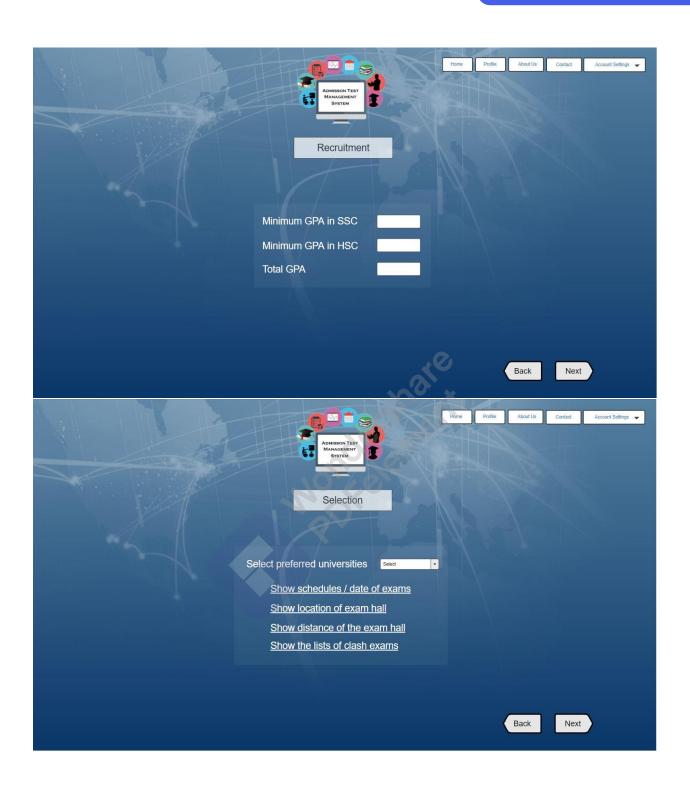
- Along with other team members ships acceptable deliverables
- Gets together with other team members and identifies the lessons learnt

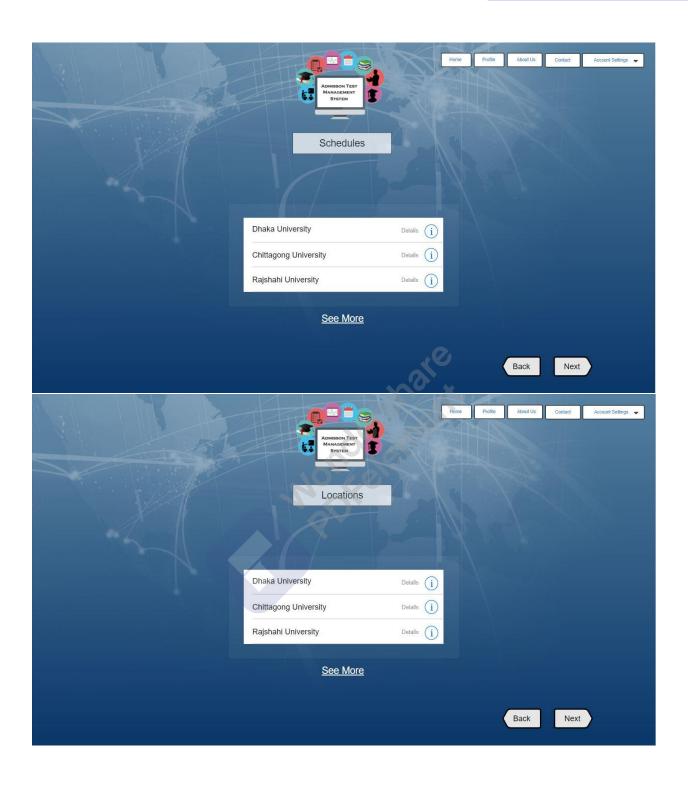


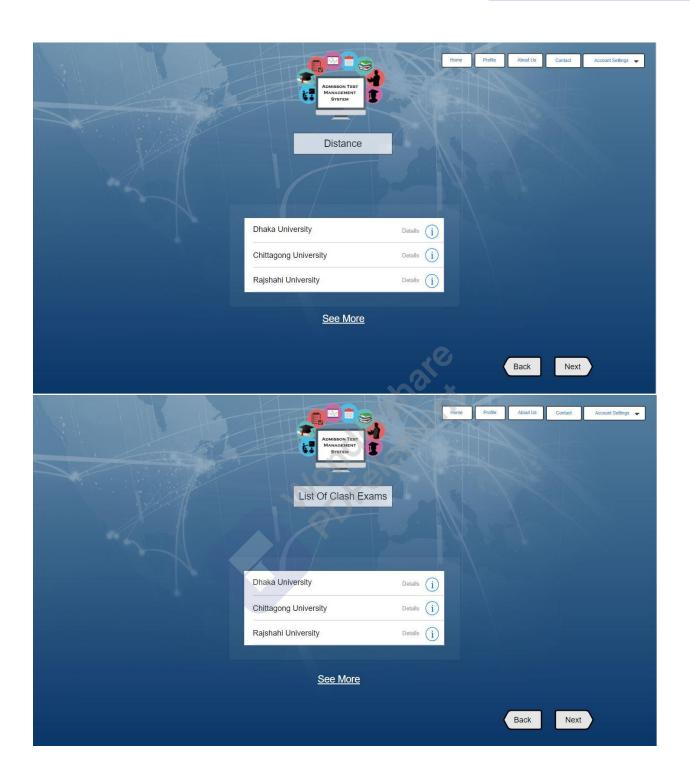
PROTOTYPE of the project

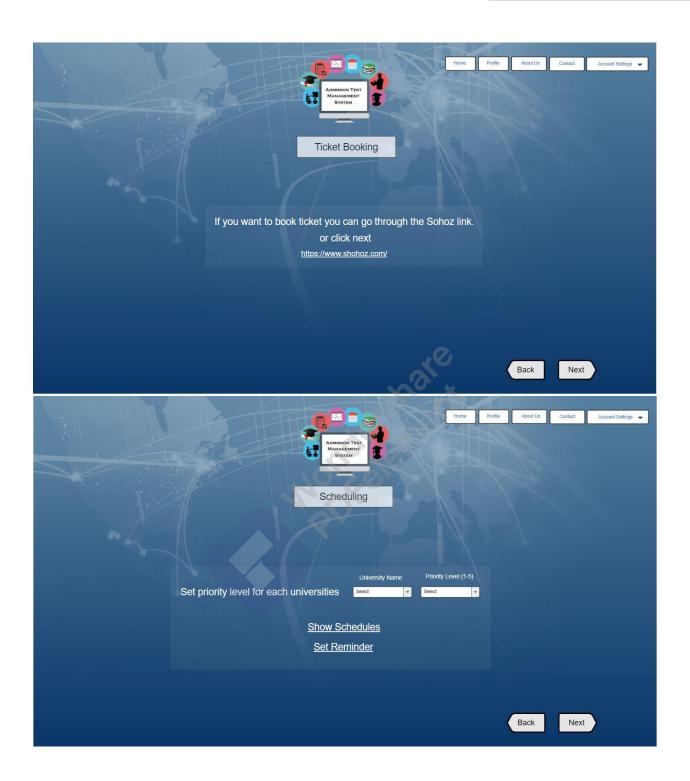




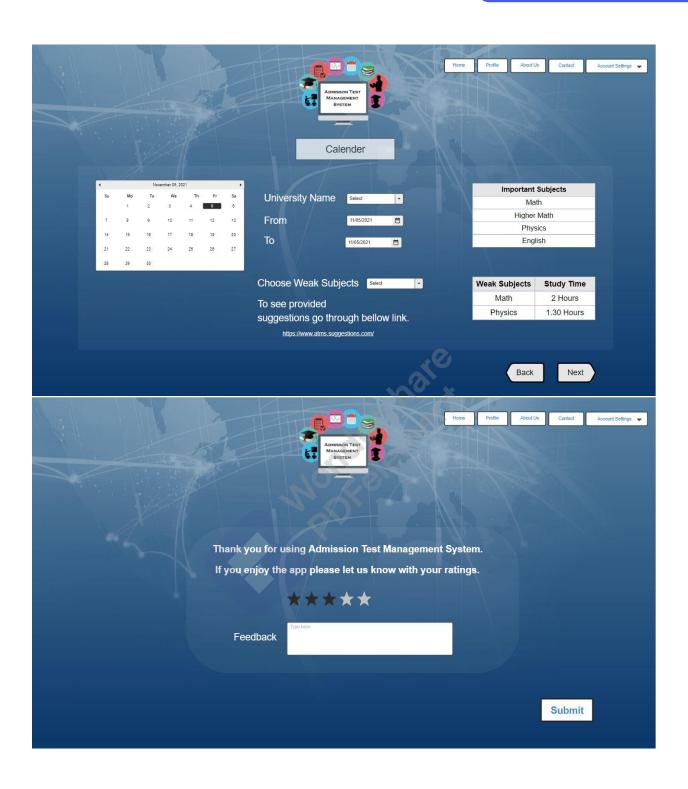












Project test Planning

In the system we are using Black box testing along with the necessary testing stages unit, Integration, system and acceptance testing.

- 1. System: Mobile
- 2. Modules:
 - **Login Session**
 - Verification
 - Wondershare Nondershare **University Information**
 - **Bus Ticket Booking**
 - Scheduling

3.

Test Case:

Project Name: Admission Test Management System	Test Designed by: Dihan, MD. Rafee-uzzaman
Test Case ID: FR_1	Test Designed date: 01- 11-2021
Test Priority (Low, Medium, High): Medium	Test Executed by: Mithila Farzana
Module Name: Login Session	Test Execution date: 08- 11-2021
Took Tikley Logic	

Test Title: Login

Description: Test login page

Precondition (If any): User must have valid username and password, age must be above 15

Test Steps	Test Data	Expected Results	Actual Results	Status (Pass/Fail)
1. Enter App 2. Sign up 3. Enter email 4. Enter password 5. Click login	Email: @gmail.com Password: ****** First Name: Last Name: Age: Contact: Location: (using device's location)	Account created. User can Login to the system.	As expected,	Pass

Post Condition: User is validated with database and successfully login to account. The account session details are logged in the database.

Project Name: Admission Test Management System	Test Designed by: Dihan, MD. Rafee-uzzaman
Test Case ID: FR_2	Test Designed date: 01-11-2021
Test Priority (Low, Medium, High): High	Test Executed by: Mithila Farzana
Module Name: Verification	Test Execution date: 08-11-2021

Test Title: Verify login with valid email and password

Description: Test login page

Precondition (If any): User must have valid username and password

Test Steps	Test Data	Expected Results	Actual Results	Status (Pass/Fail)
 Go to Login Page 	Email: rzdihan@gmail.com	User should login into the application	As expected,	Pass
Enter verified email	Password: 12345678			
Enter verified password	P			
4. Press Login				

Post Condition: The student information is successfully recorded in database.

Project Name: Admission Test Management System		m Test Designed by: Dihan, MD. Rafe uzzaman		, MD. Rafee
Test Case ID: FR_3		Test Designed date: 01-11-2021		021
Test Priority (Low, Medium, High): High		Test Executed by: Mithila Farzana		
Module Name: Stu	dent information	Test Execution	n date: 08-11-2	2021
Test Title: Verify st	udent information			
Description: Test st	udent information page			
	y): User must have valid username	and password		
Test Steps	Test Data	Expected Results	Actual Results	Status (Pass/Fail)

Post Condition: The student information is successfully recorded in database.

Project Name: Admission Test Management System	Test Designed by: Dihan, MD. Rafee-uzzaman
Test Case ID: FR_4(4.1,4.2,4.3)	Test Designed date: 01-11-2021
Test Priority (Low, Medium, High): Medium	Test Executed by: Mithila Farzana
Module Name: University information	Test Execution date: 08-11-2021

Test Title: Select Universities

Description: Test university selection page

Precondition (If any): User must have valid student information, user can choose 5 universities (loop)

Test Steps	Test Data	Expected Results	Actual Results	Status (Pass/Fail)
Choose Preferred Universities Click next	Select University: DU Select University: JU Select University: BUET Select University: RU Select University: BUP	University information is recorded	As expected,	Pass

Post Condition: The university information is successfully recorded in database.

Test Designed by: Dihan, MD. Rafee- uzzaman
Test Designed date: 01-11-2021
Test Executed by: Mithila Farzana
Test Execution date: 08-11-2021

Test Title: Show Admission test exam Schedule

Description: Test Admission test exam Schedule page

Precondition (If any): User must have valid university information

Test Steps	Test Data	Expected Results	Actual Results	Status (Pass/Fail)
 Login Select University Click next 	Click: Show DU exam schedules Click: Show JU exam schedules Click: Show BUET exam schedules Click: Show RU exam schedules Click: Show BUP exam schedules	University admission test exam Schedule will be shown	As expected,	Pass

Post Condition: The student with valid info will find true information

Test Execution date: 08-11-2021

Test Title:	Show University	v admission	test exam	Location
i Cot i itic.	JIIOW OIIIVCI SIL	y autilissioti	test exami	LUCATION

Project Name: Admission Test Management System

Description: Test university location page

Test Priority (Low, Medium, High): Medium

Module Name: University Information

Test Case ID: FR_4.5

Precondition (If any): User must have valid university information

Test Steps	Test Data	Expected Results	Actual Results	Status (Pass/Fail)
 Enter App Select University Show Location Click next 	Click: Show DU exam Locations along with schedules Click: Show JU exam Locations along with schedules Click: Show BUET exam Locations along with schedules Click: Show RU exam Locations along with schedules Click: Show BUP exam Locations along with schedules	University information is shown	As expected,	Pass

Post Condition: The student with valid info will find true information

Project Name: Admission Test Management System	Test Designed by: Dihan, MD. Rafee-uzzaman
Test Case ID: FR_4.6	Test Designed date: 01-11-2021
Test Priority (Low, Medium, High): Medium	Test Executed by: Mithila Farzana
Module Name: University Information	Test Execution date: 08-11-2021

Test Title: Show Distance

Description: Test university and user's locations

Precondition (If any): User must have valid university Selection

Test Steps	Test Data	Expected Results	Actual Results	Status (Pass/Fail)
 Enter App Select University Show Location Click Show distance from home Click next 	Click: Details	distance between user's house and the exam hall of each exam in different schedules	As expected,	Pass

Post Condition: The student with valid info will find distance information

Project Name: Admission Test Management System	Test Designed by: Dihan, MD. Rafee-uzzaman		
Test Case ID: FR_4.7	Test Designed date: 01-11-2021		
Test Priority (Low, Medium, High): Medium	Test Executed by: Team Dedicators		
Module Name: University Information	Test Execution date: 08-11-2021		

Test Title: Show the list of clash exams

Description: Show website user the list of clash exams

Precondition (If any): User must have valid university Selection

Test Steps	Test Data	Expected Results	Actual Results	Status (Pass/Fail)
 Go to the website After login enter valid student information Enter valid University information Enter valid university selection information Click Show list of clash exams Click next 	Click: Details	List of clash exams will be showed	As expected,	Pass

Post Condition: The student with valid info will find their list of clash exams

Project Name: Admiss System	ion Test M	lanagement	Test Designed by: Dihan, MD. Rafee-uzzaman	
Test Case ID: FR_5.1			Test Designed date: 01-11- 2021	
Test Priority (Low, Media	um, High): M	1edium	Test Executed by: Mithila Farzana	
Module Name: Bus Ticke	et Booking		Test Execution date: 08-11- 2021	
Test Title: Book bus tick	ets			
Description: Show user b	ous ticket bo	oking procedu	ires	
Precondition (If any): Us	ser must hav	e valid univers	sity Selection and priority level	
Test Steps	Test Data	Expected Results	Actual Results	Status (Pass/Fail)
Login After login enter valid student	Click: Details	Bus tickets booked	As expected,	Pass
information 3. Enter valid University information		Mo	Stell	
4. Enter valid university selection information				
5. Click Show list of clash exams				
6. Show Book bus				

Post Condition: The student with valid info will find schedule.

tickets

Project Name: Admission Test Management System	Test Designed by: Dihan, MD. Rafee-uzzaman
Test Case ID: FR_6.1	Test Designed date: 01-11-2021
Test Priority (Low, Medium, High): Medium	Test Executed by: Team Dedicators
Module Name: Scheduling	Test Execution date: 08-11-2021

Test Title: Verify University name and priority level

Description: Test website user scheduling

Precondition (If any): User must have valid university Selection

Test Steps	Test Data	Expected Results	Actual Results	Status (Pass/Fail)
 Go to the website After login enter valid student information 	University name: Dhaka university	University name and priority level is recorded.	As expected,	Pass
3. Enter valid University information	Priority level: 5	No.	2	
4. Enter valid university selection information				
5. Select university name				
6. Select priority level				
7. Click next				

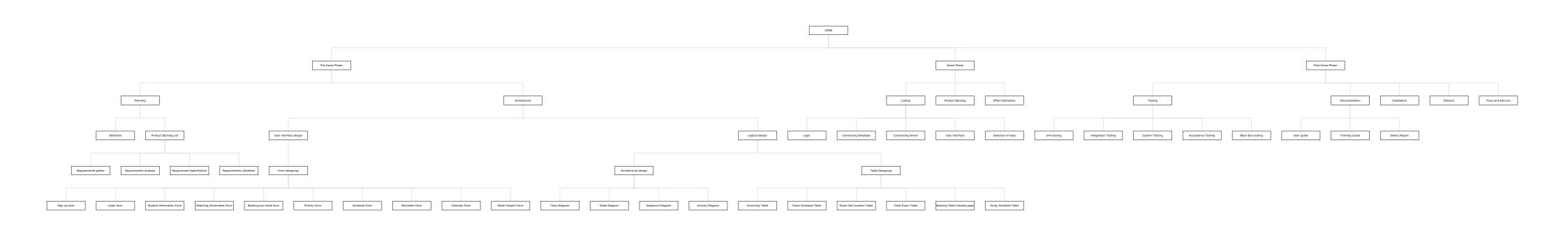
Post Condition: The student university level and priority level are recorded.

Project Name: Admission Test Ma	nagement System		Test Designe uzzaman	ed by: Dihan, MD. Rafee-
Test Case ID: FR_6.2			Test Designed	date: 01-11-2021
Test Priority (Low, Medium, High):	Medium		Test Executed	by: Team Dedicators
Module Name: Scheduling			Test Execution	n date: 08-11-2021
Test Title: Show schedule				
Description: Show website user sc	hedule			
Precondition (If any): User must h	ave valid universit	y Selection and	l priority level	
Test Steps	Test Data	Expected Results	Actual Results	Status (Pass/Fail)
 Go to the website After login enter valid student information Enter valid University information Enter valid university selection information Select university name Select priority level Click Show schedule Click next 	Click: Details	University Admission	As expected,	Pass

Post Condition: The student with valid info will find schedule.

Project Name: Admissio	n Test Management Syst	tem	Test Desig	ned by: Dihan, M[). Rafee-uzzaman
Test Cas	e ID: FR_6.3		Test Desig	ned date: 01-11-2	021
Test Priority (Low, N	Medium, High): Medium		Test Execu	ted by: Team Ded	icators
Module Na	me: Scheduling		Test Execu	tion date: 08-11-2	2021
	Test Title	: Set Remind	er		
	Description: Show v	vebsite user s	set reminder		
Prec	condition (If any): User m	nust have vali	d university	Selection	
Test Steps	Test Data	Expected	l Results	Actual Results	Status (Pass/Fail)
 Go to the website After login enter valid student information Enter valid University information Enter valid university selection information Select university name Select priority level Select set reminder Click next 	University name: Dhaka university From: 10-08-2021 To: 11-08-2021 Remind me before: 3 hours	Date and time are r		As expected,	Pass

Post Condition: The student date and reminder time are recorded.





Project Estimation and Scheduling(COCOMO)

Here the software project type is Organic.

Lines of codes= 3000

Effort=PM= Coefficient (SLOC/1000) P = 2.4*(3000/1000) $^1.05$ = 7.61

Development time =DM = $2.50*(PM)^T = 2.50*(7.60)^0.38 = 5.40$

40 .40 == 2 Required number of people = ST = PM/DM = 7.60/5.40 = 1.40 == 2

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EVA ANALYSIS

Number of weeks 6*4 = 24

Project has 41 planned work tasks

Person days needed to complete the tasks = 8*6*4 = 192

BAC = 192

Task		Planned Effort			Actual Effort		
1		12.0		.0	12.0		
2		9.0	:		11.0		
3		15.0			15.0		
4	∞	20.0			29.0	1	
5	BCWP=128	11.5	0	BCWS=174.50	9		34
6	CWF	14.0	10	S=17	11.0		ACWP=134
7	<u> </u>	15.0		CW	17.0		ACW
8		6.0		ш	8		
9		17.5	•		15.5	-	
10		8.0			6.5		
11		6.0			5.0		
12		12.0			9.0		
13		15.5			16.0		
14		8.0			8.0	1	
15		5.0			5.0	1	

Given Total Task= 41; Effort Estimated= 192 Person Day

- BAC = 182.64
- SPI = BCWP/BCWS = 128/174.50 = 0.734
- SV = BCWP-BCWS = 128-174.50 = -46.5 Person-day
- CPI = BCWP/ACWP = 128/134= 0.96
- CV = BCWP-ACWP = 128-134= -6 Person-day
- % Schedule for completion = BCWS/BAC =174.50/192 = 90.89% [% of work scheduled to be done at this time]
- Mondelement • % complete = BCWP/BAC = 128/192 = 66.67% [% of work completed at this time]

Risk Management

RISK	CATEGORY	PROBABILITY	IMPACT		
Size maybe low	PS	30%	3		
Larger number of users	PS	70%	2		
Less reuse than planned	PS	80%	2		
Deliver deadline will be tightened	BU	40%	1		
Funding will be lost	CU	40%	1		
Technology will not meet expectations	TE	30%	1		
Lack training on tools	DE	80%	3		
Sponsor declines to donate	BU	30%	1		
Users get admins password	TE	30%	2		

Limitation of budget (if it crosses)	BU	30%	3
Insufficient member (if any member takes leave or becomes sick)	ST	20%	3
Will not fins targeted users	CU	60%	1
Impact values: 1- Catastrophic 2- Critical 3- Marginal 4- Negligible	Word	element	

Impact values:

- 1- Catastrophic
- 2- Critical
- 3- Marginal
- 4- Negligible