Project Report

HIS/Basys - Safety Critical Computer Systems

Summer Semester 2021

Prof. Dr. Matthias F. Wagner

Member's List:

1. Md Sabbir Ahmed --1382361
2. Shrabanti Saha Rimi--1377509
3. Ashis Banik -- 1377253
4. Syed Fawzul Azim--1364224

- Status report
- Design model (including description of mathematical algorithms used)
- HMI design
- Updated software plan
- Hazard Analysis Results
- Safety plan
- Security plan
- Prototypes
- ...
- Standard scientific references!

Project Status Report

For period:	July 2021
Submitted by:	Group-D
Project Name:	COVID-19 Assistance Application

Status Item	**Current Status**	**Prior Status**
Overall project status	Green	Green
Project Risk	Yellow	Yellow
Schedule	Green	Green
Budget	Green	Green

Color Key	
Green	Strong probability item will meet dates and acceptable quality.
Yellow	Good probability item will meet dates and acceptable quality. Schedule, resource, or scope changes may be needed.
Red	Probable that item will **NOT** meet dates with acceptable quality without changes to schedule, resources, and/or scope.

Key Upcoming Milestones:

Prepare design model to code	17.06.2021-22.06.2021
Prepare test plan	23.06.2021-24.06.2021
Meeting to review test plan	25.06.2021-26.06.2021
Perform testing	27.06.2021-28.06.2021
Risk exposure table development	29.06.2021

Complete draft SRS	1st week of july
Complete final version of SRS	1st week of july
Send final version of SRS	1st week of july

Design mode

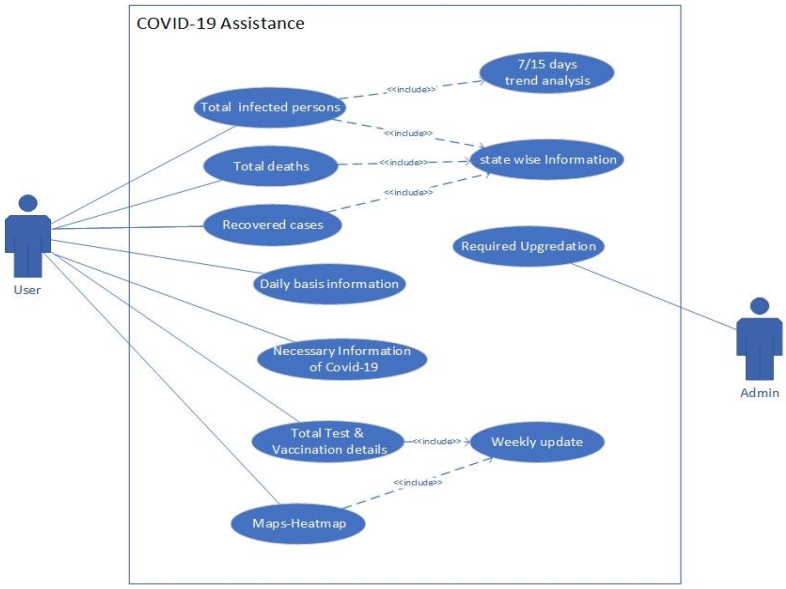


Figure-1: Use Case Diagram

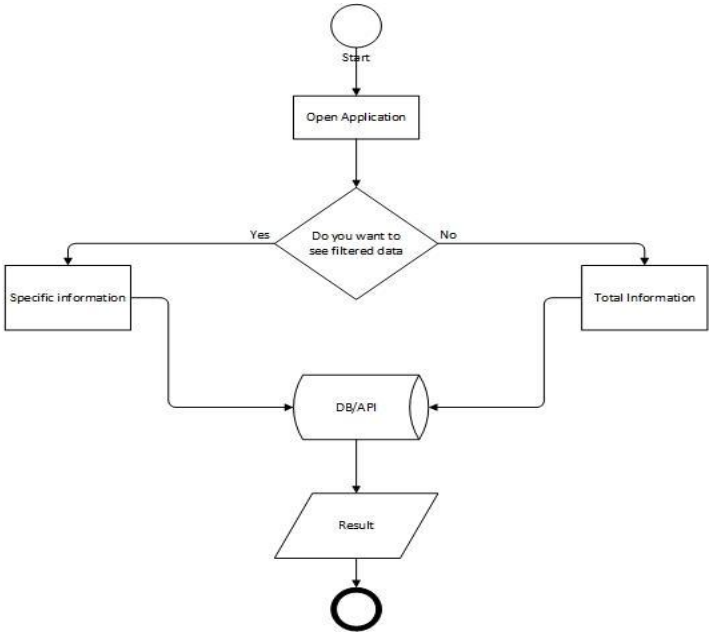


Figure-2: Activity Diagram

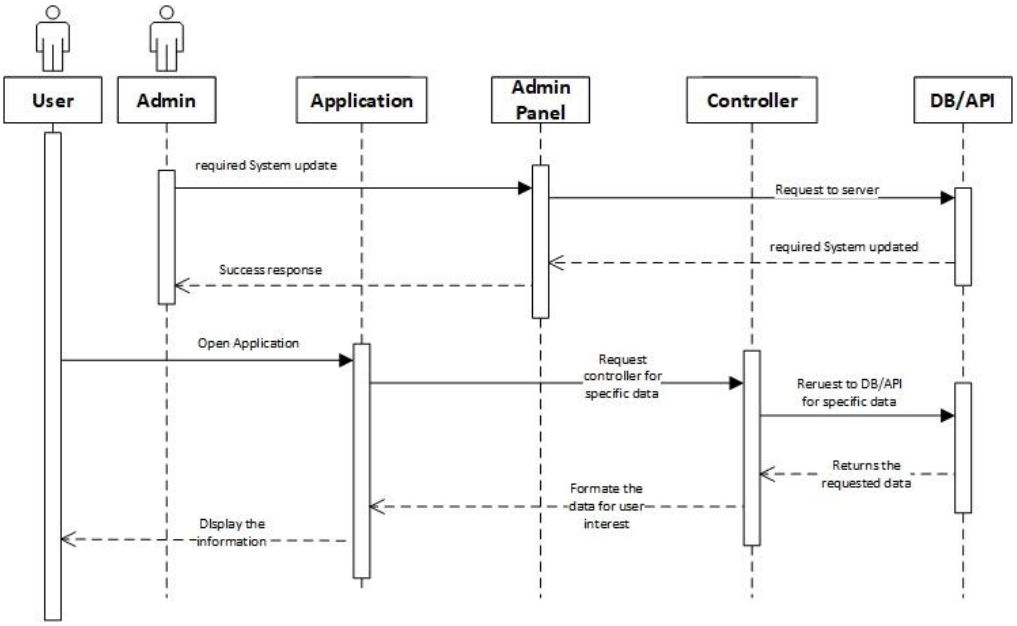


Figure-3: Sequence Diagram

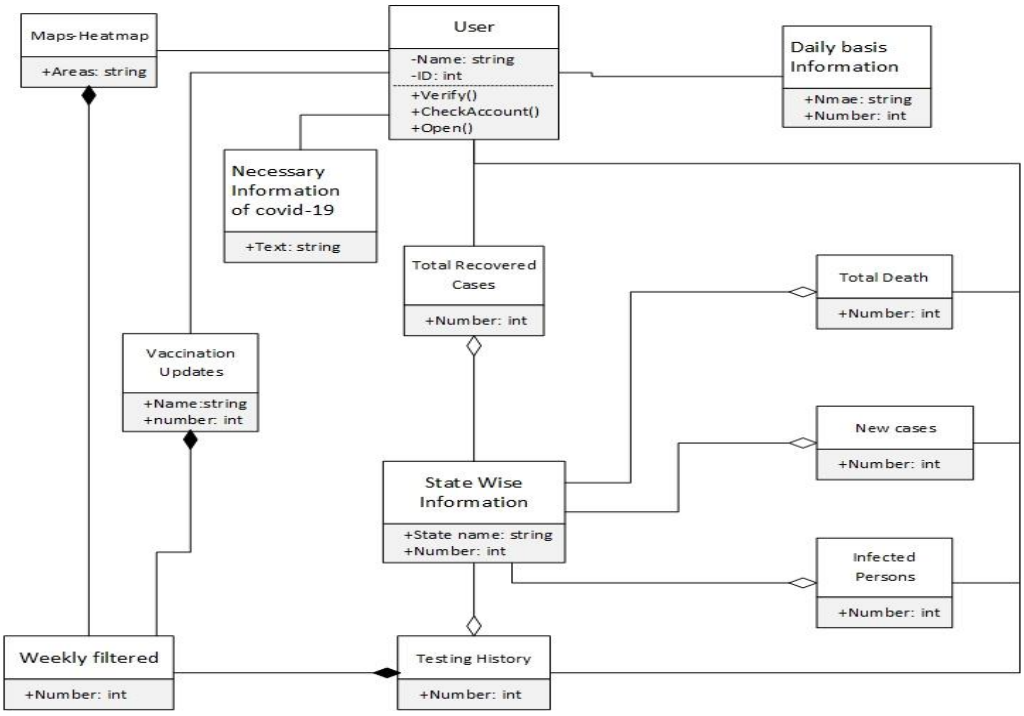


Figure-4: Class Diagram

Updated software plan:

	Weeks		Wk-1	Wk-2	WK-3	Wk-4	WK-5	WK-6	WK-7	WK-8	
	Tasks/Responsibilities	28/5/2021									Status(Completed /In progress/Not started)
SPRINT1	Project Concept clarification as per the sceneriao of COVID-19 Pandemic	Group D	SPRINT1								Completed
	Requirements gathering ,elicitation and documentation (Repeat**)	Group D									Completed
	Software design and Specification(Repeat)**	Ashis									Completed
	Project Plan with delivarables(Repeat**)	Group D									Completed
	Identify the risks to the project	Rimi									Completed
	Weekly meetings and tasks follow-up and distribition	Group D									Completed
	Implementation of Web and Mobile App **1. Develop project Skeleton** **2. UI/UX Design**	Azim, Sabbir									Completed
	Documentation	Group D									Completed
SPRINT2	**Requirements engineering**	Rimi			SPRINT2						Completed
	Analyse and feedback incorporation of previous sprint	Group D									Completed
	HIM Desing	Azim									
	Implementation of Web and Mobile App **1. Show Covid Information** **2. Implement Daily Chart**	Sabbir, Azim									Completed
	Weekly team meeting and Task distribution	Group D									Completed
	Estimation	Rimi									Completed
	Testing, Validation, Verification	Sabbir, Azim									Completed
	Hazard Analysis (STAMP)	Azim									Completed
SPRINT3	**Enhance Design model**	Ashis					SPRINT3				Completed
	Implementation of Web and Mobile App **1. Develop State wise Covid Chart** **2. Implement Age-group Cases** **3. Covid Heat-Map**	Azim, Sabbir									Completed
	Project Status Reprot	Rimi									Completed
	Testing, Validation, Verification	Sabbir, Azim									Completed
	Weekly team meeting and Task distribution	Group D									Completed
SPRINT4	Verification of deliverables	Group D							SPRINT4		Completed
	System testing	Sabbir, Azim									Completed
	Safety plan	Rimi									Completed
	Testing, Validation, Verification	Sabbir, Azim									Completed
	Updated all diagrams	Ashis									Completed
	Project Closure Report	Group D									Completed

Hazard Analysis Results:

Item Number	Function or Process Step	Failure Type/Mode	Potential Impact	SEV	Potential Causes	OCC
Item Number	Briefly outline function, step or item being analyzed	Describe what has gone wrong	What is the impact on the key output variables or internal requirements?	How severe is the effect to the User?	What causes the key input to go wrong?	How frequently is this likely to occur?

1	Accessiblility of web interface/System to user	User does not get the updated information about Covid 19	System is not accessible	10	System access failure	4
2	Updated data should be visible	Updated data should be	Data is not visible	9	Error by	3
3	The user's personal information should not be visible to all.	Users personal information is visible to	User privacy will be hampered	8	user information security	4
4	Visualization of graph/maps	User does not get the Graph/map of accurate result of the selected countries/regions COVID-19 information.	System is not accessible	7	System access failure	3
5	Vaccination updates & Testing h	npt able to input	User is not able to input	8	System access	2
6	Update Restrictions details	Admin cant give/update restrication details	System is not accessible	9	System access failure	3

Detection Mode	DET	RPN	Recommended Actions	Responsibility	Status	Signature

What are the existing controls that either prevent the failure from occurring or detect it should occur	How easy is it to detect?	Risk priority number (SEV*OCC*DET)	What are the actions for reducing the occurrence of the cause or improving the detection?	Who is responsible for the recommended action?	What is the status of the Failure	
Checking the system (Validation and verification) and other means	3	120	- Check wifi and mobile data -Check the URL (Uniform Resource Locator)	Group D	Closed	Sabbir Ahmed
Checking the system (Validation and	4	108	-Should show error message if the user is	Group D	Closed	Sabbir Ahmed
Checking the system (Validation and verification) and other means	3	96	-Check that the personal information is accessible to others	Group D	Closed	Sabbir Ahmed
Checking the system (Validation and verification) and other means	3	63	- Check wifi and mobile data -Check the URL (Uniform Resource Locator)	Group D	Closed	Sabbir Ahmed
Checking the system (Validation and	4	64	Admin cant give/update restrication details	Group D	Closed	Sabbir Ahmed
Checking the system (Validation and verification) and other means	2	54	-Should show error message if the user is unauthorized -Check the input data from user (Only give the access to authorised user access), Otherwise throw invalid user popup.	Group D	Closed	Sabbir Ahmed

	Ranking	Low Number	High Number
Severity	1-10	Low impact	High impact
Occurrence	1-5	Lowest probability to occur	Highest probability to occur
Detection	1-5	Highest probability to detect	Lowest probability to detect

(STAMP‑Based Process Analysis) hazard analysis method for our system:

1. Identification of Accident, Hazards, Safety Constraints:

Accidents	Hazards	Safety Constraints
I. People get wrong covid related information and get sick.	I. System giving wrong information and incorrect data about covid patients.	I. All the covid related information and suggestions must be verified by an admin.

I. Receiving wrong data about local covid patients and getting exposed to covid and dying.	II.System showing wrong heat map.	II. The data for the creation of a heat map will be collected from a well trusted source.

Figure 1 : Accident, hazards, safety constraints table

Safety plan

Safety is the degree to which accidental harm is properly addressed (e.g., prevented, identified, reacted to, and adapted to). Safety is classified into the following quality factors:

1.Health safety
2.Property safety
3.Environmental safety

Harm Protection	Green
Safety Incident Protection	Green
Hazard Protection	Green
Safety Risk Protection	Yellow
Safety Incident Identification	Green
Safety Incident Logging	Green
Safety Incident Analysis	Green
Safety Incident Reporting	Green
Service Degradation	Yellow
Service restoration	Yellow
Accident Prosecution	Yellow
Trend Analysis	Yellow
Safeguard Improvement	Green

HMI Prototypes:

Web Application and Mobile Application

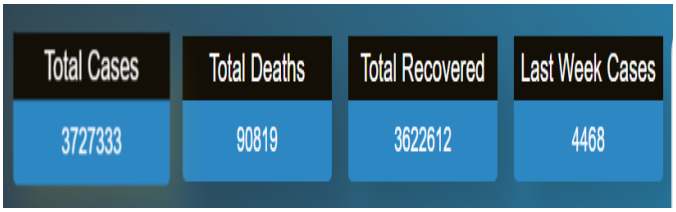
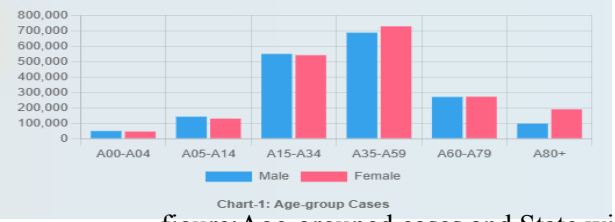


figure:Total cases & deaths:

Last 7 days Information

Date	Cases	Recovered
2021-06-23	903	28
2021-06-24	807	53
2021-06-25	739	79
2021-06-26	477	34
2021-06-27	197	24
2021-06-28	296	32

figure:Last 7 days information:



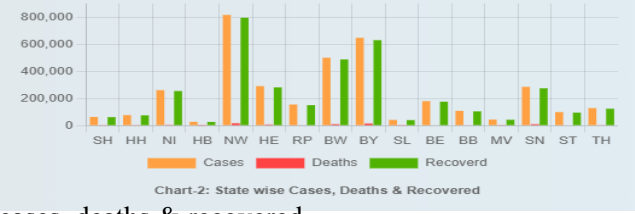
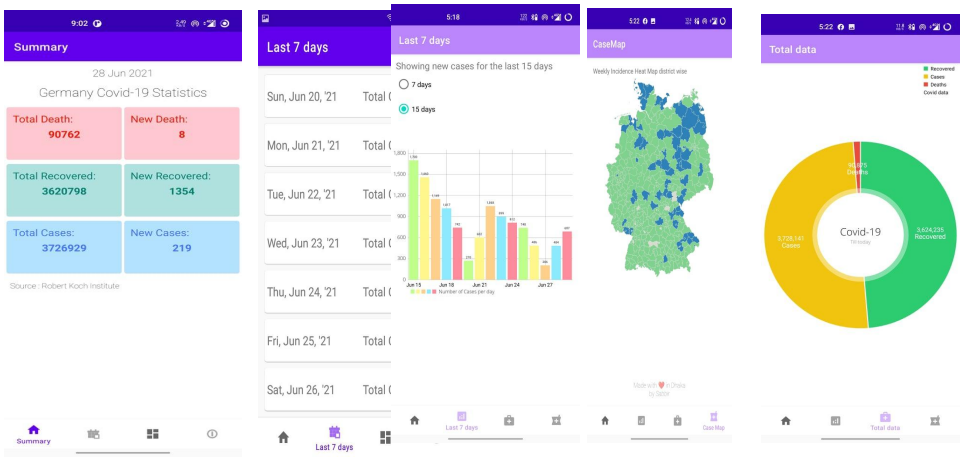


figure:Age-grouped cases and State wise cases, deaths & recovered



Testing, Validation, and Quality Assurance:

These are the tests conducted into the system to assure the quality of the system. These tests all controls are validated in our system.

ID	Functional Requirements	QC Check	QC Comment
T1	The system should provide the following information of Covid 19 1. Total Cases 2. Recovered 3. Total Deaths	Yes	Implemented
T2	The system should provide the covid 19 data of the last seven days	Yes	Implemented
T3	The system should provide the covid 19 data of vaccinations from last seven days	Yes	Implemented

T4	Application must show data in chart of age-grouped cases	Yes	Implemented
T5	Application must provide a state wise chart of cases, deaths and recovered cases.	Yes	Implemented
T6	The system must be able to show error messages when necessary	Yes	Implemented
T7	System must be able to use secondary API when primary API fails	Yes	Implemented
T8	System should provide important news link to the users	Yes	Implemented
T9	System should provide latest test cases to the users	Yes	Implemented

Table: Testing Functional Requirements of the system

References:

1. Gong, C. (2009). Human-Machine Interface: Design Principles of Visual Information in Human-Machine Interface Design. 2009 International Conference on *Intelligent Human-Machine Systems and Cybernetics*. doi:10.1109/ihmsc.2009.189