

Module Interface Specification for Software Engineering

Team #11, OKKM Insights

Mathew Petronilho

Oleg Glotov

Kyle McMaster

Kartik Chaudhari

January 17, 2025

1 Revision History

Date	Version	Notes
Date 1	1.0	Notes
Date 2	1.1	Notes

2 Symbols, Abbreviations and Acronyms

See SRS Documentation at [\[give url —SS\]](#)

[\[Also add any additional symbols, abbreviations or acronyms —SS\]](#)

Contents

1	Revision History	i
2	Symbols, Abbreviations and Acronyms	ii
3	Introduction	1
4	Notation	1
5	Module Decomposition	1
6	MIS of [Module Name —SS]	3
6.1	Module	3
6.2	Uses	3
6.3	Syntax	3
6.3.1	Exported Constants	3
6.3.2	Exported Access Programs	3
6.4	Semantics	3
6.4.1	State Variables	3
6.4.2	Environment Variables	3
6.4.3	Assumptions	3
6.4.4	Access Routine Semantics	3
6.4.5	Local Functions	4
7	MIS of Account Creation Interface	4
7.1	Module	4
7.2	Uses	4
7.3	Syntax	4
7.3.1	Exported Constants	4
7.3.2	Exported Access Programs	4
7.4	Semantics	4
7.4.1	State Variables	4
7.4.2	Environment Variables	4
7.4.3	Assumptions	5
7.4.4	Access Routine Semantics	5
7.4.5	Local Functions	5
8	MIS of Account Database Connector	5
8.1	Module	5
8.2	Uses	5
8.3	Syntax	5
8.3.1	Exported Constants	5
8.3.2	Exported Access Programs	5

8.4	Semantics	6
8.4.1	State Variables	6
8.4.2	Environment Variables	6
8.4.3	Assumptions	6
8.4.4	Access Routine Semantics	6
8.4.5	Local Functions	6
9	MIS of Account Database	7
9.1	Module	7
9.2	Uses	7
9.3	Syntax	7
9.3.1	Exported Constants	7
9.3.2	Exported Access Programs	7
9.4	Semantics	7
9.4.1	State Variables	7
9.4.2	Environment Variables	7
9.4.3	Assumptions	7
9.4.4	Access Routine Semantics	7
9.4.5	Local Functions	8
10	MIS of Account Update Interface	8
10.1	Module	8
10.2	Uses	8
10.3	Syntax	8
10.3.1	Exported Constants	8
10.3.2	Exported Access Programs	8
10.4	Semantics	8
10.4.1	State Variables	8
10.4.2	Environment Variables	9
10.4.3	Assumptions	9
10.4.4	Access Routine Semantics	9
10.4.5	Local Functions	9
11	MIS of Login Interface	9
11.1	Module	9
11.2	Uses	9
11.3	Syntax	9
11.3.1	Exported Constants	9
11.3.2	Exported Access Programs	9
11.4	Semantics	10
11.4.1	State Variables	10
11.4.2	Environment Variables	10
11.4.3	Assumptions	10

11.4.4	Access Routine Semantics	10
11.4.5	Local Functions	10
12	MIS of Access Token	10
12.1	Module	10
12.2	Uses	10
12.3	Syntax	10
12.3.1	Exported Constants	10
12.3.2	Exported Access Programs	11
12.4	Semantics	11
12.4.1	State Variables	11
12.4.2	Environment Variables	11
12.4.3	Assumptions	11
12.4.4	Access Routine Semantics	11
12.4.5	Local Functions	11
13	MIS of Account Creation Interface	11
13.1	Module	11
13.2	Uses	11
13.3	Syntax	12
13.3.1	Exported Constants	12
13.3.2	Exported Access Programs	12
13.4	Semantics	12
13.4.1	State Variables	12
13.4.2	Environment Variables	12
13.4.3	Assumptions	12
13.4.4	Access Routine Semantics	12
13.4.5	Local Functions	12
14	MIS of Account Database	12
14.1	Module	12
14.2	Uses	13
14.3	Syntax	13
14.3.1	Exported Constants	13
14.3.2	Exported Access Programs	13
14.4	Semantics	13
14.4.1	State Variables	13
14.4.2	Environment Variables	13
14.4.3	Assumptions	13
14.4.4	Access Routine Semantics	13
14.4.5	Local Functions	14

15 MIS of Account Update Interface	14
15.1 Module	14
15.2 Uses	14
15.3 Syntax	14
15.3.1 Exported Constants	14
15.3.2 Exported Access Programs	14
15.4 Semantics	14
15.4.1 State Variables	14
15.4.2 Environment Variables	14
15.4.3 Assumptions	15
15.4.4 Access Routine Semantics	15
15.4.5 Local Functions	15
16 MIS of Login Interface	15
16.1 Module	15
16.2 Uses	15
16.3 Syntax	15
16.3.1 Exported Constants	15
16.3.2 Exported Access Programs	15
16.4 Semantics	15
16.4.1 State Variables	15
16.4.2 Environment Variables	16
16.4.3 Assumptions	16
16.4.4 Access Routine Semantics	16
16.4.5 Local Functions	16
17 MIS of Access Token	16
17.1 Module	16
17.2 Uses	16
17.3 Syntax	16
17.3.1 Exported Constants	16
17.3.2 Exported Access Programs	16
17.4 Semantics	17
17.4.1 State Variables	17
17.4.2 Environment Variables	17
17.4.3 Assumptions	17
17.4.4 Access Routine Semantics	17
17.4.5 Local Functions	17
18 MIS of Labeler	17
18.1 Module	17
18.2 Uses	17
18.3 Syntax	17

18.3.1	Exported Constants	17
18.3.2	Exported Access Programs	18
18.4	Semantics	18
18.4.1	State Variables	18
18.4.2	Environment Variables	18
18.4.3	Assumptions	18
18.4.4	Access Routine Semantics	18
18.4.5	Local Functions	19
19	MIS of Client	19
19.1	Module	19
19.2	Uses	19
19.3	Syntax	19
19.3.1	Exported Constants	19
19.3.2	Exported Access Programs	19
19.4	Semantics	20
19.4.1	State Variables	20
19.4.2	Environment Variables	20
19.4.3	Assumptions	20
19.4.4	Access Routine Semantics	20
19.4.5	Local Functions	20
20	MIS of User	21
20.1	Module	21
20.2	Uses	21
20.3	Syntax	21
20.3.1	Exported Constants	21
20.3.2	Exported Access Programs	21
20.4	Semantics	21
20.4.1	State Variables	21
20.4.2	Environment Variables	21
20.4.3	Assumptions	21
20.4.4	Access Routine Semantics	22
20.4.5	Local Functions	22
21	MIS of Account Creation Controller	22
21.1	Module	22
21.2	Uses	22
21.3	Syntax	22
21.3.1	Exported Constants	22
21.3.2	Exported Access Programs	23
21.4	Semantics	23
21.4.1	State Variables	23

21.4.2	Environment Variables	23
21.4.3	Assumptions	23
21.4.4	Access Routine Semantics	23
21.4.5	Local Functions	24
22	MIS of Account Update Controller	24
22.1	Module	24
22.2	Uses	24
22.3	Syntax	25
22.3.1	Exported Constants	25
22.3.2	Exported Access Programs	25
22.4	Semantics	25
22.4.1	State Variables	25
22.4.2	Environment Variables	25
22.4.3	Assumptions	25
22.4.4	Access Routine Semantics	25
22.4.5	Local Functions	25
23	MIS of Authentication Controller	26
23.1	Module	26
23.2	Uses	26
23.3	Syntax	26
23.3.1	Exported Constants	26
23.3.2	Exported Access Programs	26
23.4	Semantics	26
23.4.1	State Variables	26
23.4.2	Environment Variables	26
23.4.3	Assumptions	26
23.4.4	Access Routine Semantics	26
23.4.5	Local Functions	27
24	MIS of Satellite Image Request Interface	27
24.1	Module	27
24.2	Uses	27
24.3	Syntax	27
24.3.1	Exported Constants	27
24.3.2	Exported Access Programs	27
24.4	Semantics	27
24.4.1	State Variables	27
24.4.2	Environment Variables	27
24.4.3	Assumptions	27
24.4.4	Access Routine Semantics	28
24.4.5	Local Functions	28

25 MIS of Satellite Image Request Controller	28
25.1 Module	28
25.2 Uses	28
25.3 Syntax	28
25.3.1 Exported Constants	28
25.3.2 Exported Access Programs	28
25.4 Semantics	28
25.4.1 State Variables	28
25.4.2 Environment Variables	29
25.4.3 Assumptions	29
25.4.4 Access Routine Semantics	29
25.4.5 Local Functions	29
26 MIS of Satellite Image Request	29
26.1 Module	29
26.2 Uses	29
26.3 Syntax	29
26.3.1 Exported Constants	29
26.3.2 Exported Access Programs	30
26.4 Semantics	30
26.4.1 State Variables	30
26.4.2 Environment Variables	30
26.4.3 Assumptions	30
26.4.4 Access Routine Semantics	30
26.4.5 Local Functions	31
27 MIS of Project Creation Interface	31
27.1 Module	31
27.2 Uses	31
27.3 Syntax	31
27.3.1 Exported Constants	31
27.3.2 Exported Access Programs	31
27.4 Semantics	31
27.4.1 State Variables	31
27.4.2 Environment Variables	31
27.4.3 Assumptions	31
27.4.4 Access Routine Semantics	32
27.4.5 Local Functions	32
28 MIS of Project Creation Controller	32
28.1 Module	32
28.2 Uses	32
28.3 Syntax	32

28.3.1	Exported Constants	32
28.3.2	Exported Access Programs	32
28.4	Semantics	32
28.4.1	State Variables	32
28.4.2	Environment Variables	33
28.4.3	Assumptions	33
28.4.4	Access Routine Semantics	33
28.4.5	Local Functions	33
29	MIS of Project	33
29.1	Module	33
29.2	Uses	33
29.3	Syntax	33
29.3.1	Exported Constants	33
29.3.2	Exported Access Programs	34
29.4	Semantics	34
29.4.1	State Variables	34
29.4.2	Environment Variables	34
29.4.3	Assumptions	34
29.4.4	Access Routine Semantics	34
29.4.5	Local Functions	35
30	MIS of Service Request Failure Interface	35
30.1	Module	35
30.2	Uses	35
30.3	Syntax	35
30.3.1	Exported Constants	35
30.3.2	Exported Access Programs	35
30.4	Semantics	36
30.4.1	State Variables	36
30.4.2	Environment Variables	36
30.4.3	Assumptions	36
30.4.4	Access Routine Semantics	36
30.4.5	Local Functions	36
31	MIS of Image Upload Interface	36
31.1	Module	36
31.2	Uses	36
31.3	Syntax	36
31.3.1	Exported Constants	36
31.3.2	Exported Access Programs	36
31.4	Semantics	37
31.4.1	State Variables	37

31.4.2	Environment Variables	37
31.4.3	Assumptions	37
31.4.4	Access Routine Semantics	37
31.4.5	Local Functions	37
32	MIS of Report Interface	37
32.1	Module	37
32.2	Uses	37
32.3	Syntax	37
32.3.1	Exported Constants	37
32.3.2	Exported Access Programs	37
32.4	Semantics	38
32.4.1	State Variables	38
32.4.2	Environment Variables	38
32.4.3	Assumptions	38
32.4.4	Access Routine Semantics	38
32.4.5	Local Functions	38
33	MIS of Report Controller	38
33.1	Module	38
33.2	Uses	38
33.3	Syntax	38
33.3.1	Exported Constants	38
33.3.2	Exported Access Programs	38
33.4	Semantics	39
33.4.1	State Variables	39
33.4.2	Environment Variables	39
33.4.3	Assumptions	39
33.4.4	Access Routine Semantics	39
33.4.5	Local Functions	39
34	MIS of Report	39
34.1	Module	39
34.2	Uses	39
34.3	Syntax	39
34.3.1	Exported Constants	39
34.3.2	Exported Access Programs	40
34.4	Semantics	40
34.4.1	State Variables	40
34.4.2	Environment Variables	40
34.4.3	Assumptions	40
34.4.4	Access Routine Semantics	40
34.4.5	Local Functions	41

35 MIS of Project Selection Interface	41
35.1 Module	41
35.2 Uses	41
35.3 Syntax	41
35.3.1 Exported Constants	41
35.3.2 Exported Access Programs	41
35.4 Semantics	41
35.4.1 State Variables	41
35.4.2 Environment Variables	41
35.4.3 Assumptions	42
35.4.4 Access Routine Semantics	42
35.4.5 Local Functions	42
36 MIS of Project Selection Controller	42
36.1 Module	42
36.2 Uses	42
36.3 Syntax	42
36.3.1 Exported Constants	42
36.3.2 Exported Access Programs	42
36.4 Semantics	42
36.4.1 State Variables	42
36.4.2 Environment Variables	43
36.4.3 Assumptions	43
36.4.4 Access Routine Semantics	43
36.4.5 Local Functions	43
37 MIS of Labeling Interface	43
37.1 Module	43
37.2 Uses	43
37.3 Syntax	43
37.3.1 Exported Constants	43
37.3.2 Exported Access Programs	43
37.4 Semantics	44
37.4.1 State Variables	44
37.4.2 Environment Variables	44
37.4.3 Assumptions	44
37.4.4 Access Routine Semantics	44
37.4.5 Local Functions	44
38 MIS of Labeling Controller	44
38.1 Module	44
38.2 Uses	45
38.3 Syntax	45

38.3.1	Exported Constants	45
38.3.2	Exported Access Programs	45
38.4	Semantics	45
38.4.1	State Variables	45
38.4.2	Environment Variables	45
38.4.3	Assumptions	45
38.4.4	Access Routine Semantics	45
38.4.5	Local Functions	46
39	MIS of Image	46
39.1	Module	46
39.2	Uses	46
39.3	Syntax	46
39.3.1	Exported Constants	46
39.3.2	Exported Access Programs	46
39.4	Semantics	46
39.4.1	State Variables	46
39.4.2	Environment Variables	46
39.4.3	Assumptions	47
39.4.4	Access Routine Semantics	47
39.4.5	Local Functions	47
40	Appendix	49

3 Introduction

The following document details the Module Interface Specifications for [Fill in your project name and description —SS]

Complementary documents include the System Requirement Specifications and Module Guide. The full documentation and implementation can be found at [provide the url for your repo —SS]

4 Notation

[You should describe your notation. You can use what is below as a starting point. —SS]

The structure of the MIS for modules comes from Hoffman and Strooper (1995), with the addition that template modules have been adapted from Ghezzi et al. (2003). The mathematical notation comes from Chapter 3 of Hoffman and Strooper (1995). For instance, the symbol $:=$ is used for a multiple assignment statement and conditional rules follow the form $(c_1 \Rightarrow r_1 | c_2 \Rightarrow r_2 | \dots | c_n \Rightarrow r_n)$.

The following table summarizes the primitive data types used by Software Engineering.

Data Type	Notation	Description
character	char	a single symbol or digit
integer	\mathbb{Z}	a number without a fractional component in $(-\infty, \infty)$
natural number	\mathbb{N}	a number without a fractional component in $[1, \infty)$
real	\mathbb{R}	any number in $(-\infty, \infty)$
date	Date	provides a specific date and time

The specification of Software Engineering uses some derived data types: sequences, strings, and tuples. Sequences are lists filled with elements of the same data type. Strings are sequences of characters. Tuples contain a list of values, potentially of different types. In addition, Software Engineering uses functions, which are defined by the data types of their inputs and outputs. Local functions are described by giving their type signature followed by their specification.

5 Module Decomposition

The following table is taken directly from the Module Guide document for this project.

Level 1	Level 2
Hardware-Hiding	
Behaviour-Hiding	Input Parameters Output Format Output Verification Temperature ODEs Energy Equations Control Module Specification Parameters Module
Software Decision	Sequence Data Structure ODE Solver Plotting

Table 1: Module Hierarchy

6 MIS of [Module Name —SS]

[Use labels for cross-referencing —SS]

[You can reference SRS labels, such as R??. —SS]

[It is also possible to use L^AT_EX for hyperlinks to external documents. —SS]

6.1 Module

[Short name for the module —SS]

6.2 Uses

6.3 Syntax

6.3.1 Exported Constants

6.3.2 Exported Access Programs

Name	In	Out	Exceptions
[accessProg —SS]	-	-	-

6.4 Semantics

6.4.1 State Variables

[Not all modules will have state variables. State variables give the module a memory. —SS]

6.4.2 Environment Variables

[This section is not necessary for all modules. Its purpose is to capture when the module has external interaction with the environment, such as for a device driver, screen interface, keyboard, file, etc. —SS]

6.4.3 Assumptions

[Try to minimize assumptions and anticipate programmer errors via exceptions, but for practical purposes assumptions are sometimes appropriate. —SS]

6.4.4 Access Routine Semantics

[accessProg —SS]():

- transition: [if appropriate —SS]
- output: [if appropriate —SS]

- exception: [if appropriate —SS]

[A module without environment variables or state variables is unlikely to have a state transition. In this case a state transition can only occur if the module is changing the state of another module. —SS]

[Modules rarely have both a transition and an output. In most cases you will have one or the other. —SS]

6.4.5 Local Functions

[As appropriate —SS] [These functions are for the purpose of specification. They are not necessarily something that is going to be implemented explicitly. Even if they are implemented, they are not exported; they only have local scope. —SS]

7 MIS of Account Creation Interface

7.1 Module

Account Creation Interface

7.2 Uses

Account Creation Controller 21

7.3 Syntax

7.3.1 Exported Constants

None

7.3.2 Exported Access Programs

Name	In	Out	Exceptions
renderPage	Enum[labeler, client]	-	-
submitForm	list[(string, string)]	-	-

7.4 Semantics

7.4.1 State Variables

None

7.4.2 Environment Variables

win: 2D sequence of coloured pixels

7.4.3 Assumptions

None

7.4.4 Access Routine Semantics

renderPage(userType):

- transition: win := Modify window so that it shows a registration form that asks for the necessary information depending on if the user is a labeler or client.

submitForm(formData):

- transition: Passes the submitted form data to the Account Creation Controller for validation and processing.

7.4.5 Local Functions

None

8 MIS of Account Database Connector

8.1 Module

Account Database Connector

8.2 Uses

Account Database [14](#)

8.3 Syntax

8.3.1 Exported Constants

None

8.3.2 Exported Access Programs

Name	In	Out	Exceptions
insertUser	User	-	-
retrieveUser	string	User	-
updateUser	User	-	-
userExists	string	boolean	-
makeDBConnection	credentials	-	-

8.4 Semantics

8.4.1 State Variables

None

8.4.2 Environment Variables

databaseConnection: connection to relational database

8.4.3 Assumptions

None

8.4.4 Access Routine Semantics

insertUser(user):

- transition: Request to insert user into database through databaseConnection.

retrieveUser(email):

- output:
$$\begin{cases} \text{User where User.email} == \text{email}, & \text{if userExists(email)} \\ \text{null}, & \text{otherwise} \end{cases}$$

updateUser(user):

- transition:
$$\begin{cases} \text{Request to update user in database}, & \text{if userExists(user.email)} \\ \text{Do nothing} & \text{otherwise} \end{cases}$$

userExists(email):

- output: out :=
$$\exists \text{User} \in \text{Database s.t. User.email} == \text{email}$$

makeDBConnection(credentials):

- transition: databaseConnection := connection is established with database if credentials are correct

8.4.5 Local Functions

None

9 MIS of Account Database

9.1 Module

Account Database

9.2 Uses

None

9.3 Syntax

9.3.1 Exported Constants

None

9.3.2 Exported Access Programs

Name	In	Out	Exceptions
insertUser	User	-	-
retrieveUser	string	User	-
updateUser	User	-	-
userExists	string	boolean	-

9.4 Semantics

9.4.1 State Variables

None

9.4.2 Environment Variables

databaseConnection: connection to Application

9.4.3 Assumptions

None

9.4.4 Access Routine Semantics

insertUser(user):

- transition: Insert user into database.

retrieveUser(email):

- output:
$$\begin{cases} \text{User where User.email} == \text{email}, & \text{if userExists(email)} \\ \text{null}, & \text{otherwise} \end{cases}$$

updateUser(user):

- transition:
$$\begin{cases} \text{Update user in database}, & \text{if userExists(user.email)} \\ \text{Do nothing} & \text{otherwise} \end{cases}$$

userExists(email):

- output: $\text{out} := \exists \text{User} \in \text{Database s.t. User.email} == \text{email}$

9.4.5 Local Functions

None

10 MIS of Account Update Interface

10.1 Module

Account Update Interface

10.2 Uses

Account Update Controller [22](#)

10.3 Syntax

10.3.1 Exported Constants

None

10.3.2 Exported Access Programs

Name	In	Out	Exceptions
renderPage	User	-	-
submitForm	list[(string, string)]	-	-

10.4 Semantics

10.4.1 State Variables

None

10.4.2 Environment Variables

win: 2D sequence of coloured pixels

10.4.3 Assumptions

None

10.4.4 Access Routine Semantics

renderPage(userInfo):

- transition: win := Modify window so that it shows a form with the current user's information. This information can be changed by the user.

submitForm(formData):

- transition: Passes the submitted changes to the Account Update Controller for validation and processing.

10.4.5 Local Functions

None

11 MIS of Login Interface

11.1 Module

Login Interface

11.2 Uses

Authentication Controller [23](#)

11.3 Syntax

11.3.1 Exported Constants

None

11.3.2 Exported Access Programs

Name	In	Out	Exceptions
renderPage	-	-	-
submitForm	list[(string, string)]	-	-

11.4 Semantics

11.4.1 State Variables

None

11.4.2 Environment Variables

win: 2D sequence of coloured pixels

11.4.3 Assumptions

None

11.4.4 Access Routine Semantics

renderPage():

- transition: win := Modify window so that it shows a login form.

submitForm(formData):

- transition: Passes the submitted credentials to the Authentication Controller for validation.

11.4.5 Local Functions

None

12 MIS of Access Token

12.1 Module

Access Token

12.2 Uses

None

12.3 Syntax

12.3.1 Exported Constants

None

12.3.2 Exported Access Programs

Name	In	Out	Exceptions
isExpired	-	boolean	-
renew	-	-	-

12.4 Semantics

12.4.1 State Variables

- tokenValue: string
- expirationTime: Date
- userID: string

12.4.2 Environment Variables

None

12.4.3 Assumptions

None

12.4.4 Access Routine Semantics

isExpired():

- output: out := currentTime > expirationTime

renew():

- transition: expirationTime := expirationTime + 5 hours

12.4.5 Local Functions

None

13 MIS of Account Creation Interface

13.1 Module

Account Creation Interface

13.2 Uses

Account Creation Controller [21](#)

13.3 Syntax

13.3.1 Exported Constants

None

13.3.2 Exported Access Programs

Name	In	Out	Exceptions
renderPage	Enum[labeler, client]	-	-
submitForm	list[(string, string)]	-	-

13.4 Semantics

13.4.1 State Variables

None

13.4.2 Environment Variables

win: 2D sequence of coloured pixels

13.4.3 Assumptions

None

13.4.4 Access Routine Semantics

renderPage(userType):

- transition: win := Modify window so that it shows a registration form that asks for the necessary information depending on if the user is a labeler or client.

submitForm(formData):

- transition: Passes the submitted form data to the Account Creation Controller for validation and processing.

13.4.5 Local Functions

None

14 MIS of Account Database

14.1 Module

Account Database

14.2 Uses

Relational Database

14.3 Syntax

14.3.1 Exported Constants

None

14.3.2 Exported Access Programs

Name	In	Out	Exceptions
insertUser	User	-	-
retrieveUser	string	User	-
updateUser	User	-	-
userExists	string	boolean	-

14.4 Semantics

14.4.1 State Variables

None

14.4.2 Environment Variables

databaseConnection: connection to relational database

14.4.3 Assumptions

None

14.4.4 Access Routine Semantics

insertUser(user):

- transition: Insert user into database through databaseConnection.

retrieveUser(email):

- output:
$$\begin{cases} \text{User where User.email == email,} & \text{if userExists(email)} \\ \text{null,} & \text{otherwise} \end{cases}$$

updateUser(user):

- transition:

$$\begin{cases} \text{Update user in database through databaseConection,} & \text{if userExists(user.email)} \\ \text{Do nothing} & \text{otherwise} \end{cases}$$

userExists(email):

- output: out :=

$$\exists \text{User} \in \text{Databases s.t. User.email} = \text{email}$$

14.4.5 Local Functions

None

15 MIS of Account Update Interface

15.1 Module

Account Update Interface

15.2 Uses

Account Update Controller [22](#)

15.3 Syntax

15.3.1 Exported Constants

None

15.3.2 Exported Access Programs

Name	In	Out	Exceptions
renderPage	User	-	-
submitForm	list[(string, string)]	-	-

15.4 Semantics

15.4.1 State Variables

None

15.4.2 Environment Variables

win: 2D sequence of coloured pixels

15.4.3 Assumptions

None

15.4.4 Access Routine Semantics

renderPage(userInfo):

- transition: win := Modify window so that it shows a form with the current user's information. This information can be changed by the user.

submitForm(formData):

- transition: Passes the submitted changes to the Account Update Controller for validation and processing.

15.4.5 Local Functions

None

16 MIS of Login Interface

16.1 Module

Login Interface

16.2 Uses

Authentication Controller [23](#)

16.3 Syntax

16.3.1 Exported Constants

None

16.3.2 Exported Access Programs

Name	In	Out	Exceptions
renderPage	-	-	-
submitForm	list[(string, string)]	-	-

16.4 Semantics

16.4.1 State Variables

None

16.4.2 Environment Variables

win: 2D sequence of coloured pixels

16.4.3 Assumptions

None

16.4.4 Access Routine Semantics

renderPage():

- transition: win := Modify window so that it shows a login form.

submitForm(formData):

- transition: Passes the submitted credentials to the Authentication Controller for validation.

16.4.5 Local Functions

None

17 MIS of Access Token

17.1 Module

Access Token

17.2 Uses

None

17.3 Syntax

17.3.1 Exported Constants

None

17.3.2 Exported Access Programs

Name	In	Out	Exceptions
isExpired	-	boolean	-
renew	-	-	-

17.4 Semantics

17.4.1 State Variables

- tokenValue: string
- expirationTime: Date
- userID: string

17.4.2 Environment Variables

None

17.4.3 Assumptions

None

17.4.4 Access Routine Semantics

isExpired():

- output: out := currentTime > expirationTime

renew():

- transition: expirationTime := expirationTime + 5 hours

17.4.5 Local Functions

None

18 MIS of Labeler

18.1 Module

Labeler

18.2 Uses

Extends User [20](#)

18.3 Syntax

18.3.1 Exported Constants

None

18.3.2 Exported Access Programs

Name	In	Out	Exceptions
getFirstName	-	string	-
getLastName	-	string	-
getSkills	-	list[string]	-
getAvailability	-	int	-
setFirstName	string	-	-
setLastName	string	-	-
setSkills	list[string]	-	-
setAvailability	int	-	-

18.4 Semantics

18.4.1 State Variables

- firstName: string
- lastName: string
- skills: list[string]
- availability: int

18.4.2 Environment Variables

None

18.4.3 Assumptions

None

18.4.4 Access Routine Semantics

getFirstName():

- output: out := firstName

getLastName():

- output: out := lastName

getSkills():

- output: out := skills

getAvailability():

- output: out := availability

setFirstName(newfn):

- transition: firstName := newfn

setLastName(newln):

- transition: lastName := newln

setSkills(newSkills):

- transition: skills := newSkills

setAvailability(newAvail):

- transition: availability := newAvail

18.4.5 Local Functions

None

19 MIS of Client

19.1 Module

Client

19.2 Uses

Extends User [20](#)

19.3 Syntax

19.3.1 Exported Constants

None

19.3.2 Exported Access Programs

Name	In	Out	Exceptions
getCompanyName	-	string	-
getIndustry	-	string	-
getTypicalProject	-	Image	-
setCompanyName	string	-	-
setIndustry	string	-	-
setTypicalProject	string	-	-

19.4 Semantics

19.4.1 State Variables

- `companyName`: `string`
- `industry`: `string`
- `typicalProject`: `string`

19.4.2 Environment Variables

None

19.4.3 Assumptions

None

19.4.4 Access Routine Semantics

`getCompanyName()`:

- `output`: `out := companyName`

`getIndustry()`:

- `output`: `out := industry`

`getTypicalProject()`:

- `output`: `out := typicalProject`

`setCompanyName(newcn)`:

- `transition`: `companyName := newcn`

`setIndustry(newIndustry)`:

- `transition`: `industry := newIndustry`

`setTypicalProject(newtp)`:

- `transition`: `typicalProject := newtp`

19.4.5 Local Functions

None

20 MIS of User

20.1 Module

User

20.2 Uses

None

20.3 Syntax

20.3.1 Exported Constants

None

20.3.2 Exported Access Programs

Name	In	Out	Exceptions
getEmail	-	string	-
getPassword	-	string	-
getProfilePic	-	Image	-
setEmail	string	-	-
setPassword	string	-	-
setProfilePic	string	-	-

20.4 Semantics

20.4.1 State Variables

- email: string
- password: string
- profilePic: image

20.4.2 Environment Variables

None

20.4.3 Assumptions

None

20.4.4 Access Routine Semantics

getEmail():

- output: out := email

getPassword():

- output: out := password

getProfilePic():

- output: out := profilePic

setEmail(newEmail):

- transition: email := newEmail

setPassword(newPassword):

- transition: password := newPassword

setProfilePic(newProfilePic):

- transition: profilePic := newProfilePic

20.4.5 Local Functions

None

21 MIS of Account Creation Controller

21.1 Module

Account Creation Controller

21.2 Uses

Account Creation Interface [13](#)

Account Database [14](#)

User [20](#)

Labeler [18](#)

Client [19](#)

21.3 Syntax

21.3.1 Exported Constants

None

21.3.2 Exported Access Programs

Name	In	Out	Exceptions
validateForm	list[(string, string)], Enum[labeler, client]	boolean	-
createUser	list[(string, string)], Enum[labeler, client]	User	-
uploadUser	User	-	DatabaseException

21.4 Semantics

21.4.1 State Variables

None

21.4.2 Environment Variables

None

21.4.3 Assumptions

Assumes AccountDatabase is operational when calling uploadUser.

21.4.4 Access Routine Semantics

validateForm(formData, userType):

- output: $\text{out} := \text{hasRequiredFields}(\text{formData}, \text{userFields}) \wedge \text{isValidEmail}(\text{formData.email}) \wedge \text{isValidPassword}(\text{formData.password}) \wedge$

$$\begin{cases} \text{hasRequiredFields}(\text{formData}, \text{labelerFields}), & \text{if } \text{userType} = \text{"labeler"} \\ \text{hasRequiredFields}(\text{formData}, \text{clientFields}), & \text{if } \text{userType} = \text{"client"} \\ \text{true}, & \text{otherwise} \end{cases}$$

Where:

$\text{userFields} = \{\text{email}, \text{password}\}$
 $\text{labelerFields} = \{\text{firstName}, \text{lastName}, \text{skills}, \text{availability}\}$
 $\text{clientFields} = \{\text{companyName}, \text{industry}, \text{typicalProject}\}$

createUser(formData, userType):

- output: $\text{out} :=$

$$\begin{cases} \text{Labeler}(\text{formData.email}, \text{formData.password}, \text{formData.firstName}, \\ \text{formData.lastName}, \text{formData.skills}, \text{int}(\text{formData.availability})), & \text{if userType} = \text{"labeler"} \\ \text{Client}(\text{formData.email}, \text{formData.password}, \text{formData.companyName}, \\ \text{formData.industry}, \text{formData.typicalProject}) & \text{if userType} = \text{"client"} \end{cases}$$

uploadUser(newUser):

- transition: Passes the User object to the AccountDatabase for storage.
- exception: Throws DatabaseException if storage fails.

21.4.5 Local Functions

- hasRequiredFields(data, fields) = $\forall \text{field} \in \text{fields}, (\text{data}[\text{field}] \neq \text{""})$
- isValidEmail(email) = $\text{email} \in V \wedge \text{email} \neg \in \text{Registered Emails}$

Let E represent the set of all email addresses, and let V represent the set of all valid email addresses. A valid email address conforms to the general pattern:

$$V = (\forall \text{email} \in E \mid \text{email matches the pattern } [\text{a-zA-Z0-9+.-}]+\text{@}[\text{a-zA-Z0-9.-}]+[\text{a-zA-Z}])$$

- isValidPassword(password) = *(password matches the pattern $(?=.*[\text{a-z}])(?=.*[\text{A-Z}])(?=.*[0-9])(?=.*[\#\$\%\&])[\text{a-zA-Z0-9}\#\$\%\&]\{8,\}$)*

22 MIS of Account Update Controller

22.1 Module

Account Update Controller

22.2 Uses

Account Update Interface [15](#)

Account Database [14](#)

User [20](#)

22.3 Syntax

22.3.1 Exported Constants

None

22.3.2 Exported Access Programs

Name	In	Out	Exceptions
validateForm	list[(string, string)]	boolean	-
getUser	string	-	-
requestUpdate	User	-	DatabaseException

22.4 Semantics

22.4.1 State Variables

- user: User

22.4.2 Environment Variables

None

22.4.3 Assumptions

Assumes AccountDatabase is operational when calling requestUpdate.

22.4.4 Access Routine Semantics

validateForm(formData):

- output: $\text{out} := \forall \text{data} \in \text{formData}, (\text{data}[1] \neq "")$

getUser(email):

- transition: $\text{user} := \text{AccountDatabase.retreiveUser}(\text{email})$

requestUpdate(updatedUser):

- transition: Passes the updated User object to the AccountDatabase for modifications.
- exception: Throws DatabaseException if storage fails.

22.4.5 Local Functions

None

23 MIS of Authentication Controller

23.1 Module

Authentication Controller

23.2 Uses

Login Interface [37](#)

Account Database [14](#)

Access Token [17](#)

23.3 Syntax

23.3.1 Exported Constants

None

23.3.2 Exported Access Programs

Name	In	Out	Exceptions
validCredentials	(string, string)	boolean	-
generateAccessToken	string	-	-

23.4 Semantics

23.4.1 State Variables

- token: AccessToken

23.4.2 Environment Variables

None

23.4.3 Assumptions

Assumes AccountDatabase is operational when calling validCredentials.

23.4.4 Access Routine Semantics

validCredentials(email, password):

- output: $\text{out} := \text{AccountDatabase.retreiveUser(email)} \neq \text{null}$
 $\wedge \text{AccountDatabase.retreiveUser(email).getPassword()} == \text{password}$

generateAccessToken(email):

- transition: token := AccessToken(email)

23.4.5 Local Functions

None

24 MIS of Satellite Image Request Interface

24.1 Module

Satellite Image Request Interface

24.2 Uses

Satellite Image Request Controller [25](#)

24.3 Syntax

24.3.1 Exported Constants

None

24.3.2 Exported Access Programs

Name	In	Out	Exceptions
renderPage	-	-	-
submitForm	list[(string, string)]	-	-

24.4 Semantics

24.4.1 State Variables

None

24.4.2 Environment Variables

win: 2D sequence of coloured pixels

24.4.3 Assumptions

None

24.4.4 Access Routine Semantics

renderPage():

- transition: win := Modify window so that it shows a form requesting information regarding an image request.

submitForm(formData):

- transition: Passes the submitted changes to the Satellite Image Request Controller for validation and processing.

24.4.5 Local Functions

None

25 MIS of Satellite Image Request Controller

25.1 Module

Satellite Image Request Controller

25.2 Uses

Satellite Image Request Interface [24](#)

Satellite Image Request [26](#)

25.3 Syntax

25.3.1 Exported Constants

None

25.3.2 Exported Access Programs

Name	In	Out	Exceptions
validateForm	list[(string, string)]	boolean	-
requestImages	SatelliteImageRequest	-	-

25.4 Semantics

25.4.1 State Variables

None

25.4.2 Environment Variables

None

25.4.3 Assumptions

None

25.4.4 Access Routine Semantics

validateForm(formData):

- output: $\text{out} := \forall \text{data} \in \text{formData}, (\text{data}[1] \neq "")$

requestImages(imgRequest):

- transition: Passes imgRequest to third party image provider to be processed.

25.4.5 Local Functions

- calculateCost(imgRequest): $\text{out} :=$ Use information given to calculate the cost of a request using third party rates

26 MIS of Satellite Image Request

26.1 Module

Satellite Image Request

26.2 Uses

None

26.3 Syntax

26.3.1 Exported Constants

None

26.3.2 Exported Access Programs

Name	In	Out	Exceptions
getLocation	-	(float, float)	-
getRadius	-	float	-
getDate	-	Date	-
setLocation	(float, float)	-	-
setRadius	float	-	-
setDate	Date	-	-

26.4 Semantics

26.4.1 State Variables

- locationX: float
- locationY: float
- radius: float
- date: Date

26.4.2 Environment Variables

None

26.4.3 Assumptions

None

26.4.4 Access Routine Semantics

getLocation():

- output: out := (locationX, locationY)

getRadius():

- output: out := radius

getDate():

- output: out := date

setLocation(x, y):

- transition: locationX, locationY := x, y

setRadius(newRadius):

- transition: radius := newRadius

setDate(newDate):

- transition: date := newDate

26.4.5 Local Functions

None

27 MIS of Project Creation Interface

27.1 Module

Project Creation Interface

27.2 Uses

Project Creation Controller [28](#)

27.3 Syntax

27.3.1 Exported Constants

None

27.3.2 Exported Access Programs

Name	In	Out	Exceptions
renderPage	-	-	-
submitForm	list[(string, string)]	-	-

27.4 Semantics

27.4.1 State Variables

None

27.4.2 Environment Variables

win: 2D sequence of coloured pixels

27.4.3 Assumptions

None

27.4.4 Access Routine Semantics

renderPage():

- transition: win := Modify window so that it shows a form requesting information regarding creating a new project.

submitForm(formData):

- transition: Passes the submitted changes to the Project Creation Controller for validation and processing.

27.4.5 Local Functions

None

28 MIS of Project Creation Controller

28.1 Module

Project Creation Controller

28.2 Uses

Project Creation Interface [27](#)

Project [29](#)

28.3 Syntax

28.3.1 Exported Constants

None

28.3.2 Exported Access Programs

Name	In	Out	Exceptions
validateForm	list[(string, string)]	boolean	-
createNewProject	list[(string, string)]	Project	-

28.4 Semantics

28.4.1 State Variables

None

28.4.2 Environment Variables

None

28.4.3 Assumptions

None

28.4.4 Access Routine Semantics

validateForm(formData):

- output: $\text{out} := \forall \text{data} \in \text{formData}, (\text{data}[1] \neq "")$

createNewProject(formData):

- output: $\text{out} := \text{Project}(\text{formData.name}, \text{formData.description}, \text{formData.labelClasses.split}(), \text{Date}(\text{formData.startDate}), \text{Date}(\text{formData.endDate}))$

28.4.5 Local Functions

- calculateEstimatedCost(project): $\text{out} :=$ Use information given to calculate the estimated cost of a project.

29 MIS of Project

29.1 Module

Project

29.2 Uses

None

29.3 Syntax

29.3.1 Exported Constants

None

29.3.2 Exported Access Programs

Name	In	Out	Exceptions
getProjectID	-	int	-
getName	-	string	-
getDescription	-	string	-
getLabelClasses	-	list[Enum[string]]	-
getTimePeriod	-	(Date, Date)	-
setName	string	-	-
setDescription	string	-	-
setLabelClasses	list[Enum[string]]	-	-
setTimePeriod	(Date, Date)	-	-

29.4 Semantics

29.4.1 State Variables

- projectID: int
- name: string
- description: string
- labelClasses: list[Enum[String]]
- startDate: Date
- endDate: Date

29.4.2 Environment Variables

None

29.4.3 Assumptions

None

29.4.4 Access Routine Semantics

getProjectID():

- output: out := projectID

getName():

- output: out := name

getDescription():

- output: out := description

getLabelClasses():

- output: out := labelClasses

getTimePeriod():

- output: out := (startDate, endDate)

setName(newName):

- transition: name := newName

setDescription(newDesc):

- transition: description := newDesc

setLabelClasses(newlc):

- transition: labelClasses := newlc

setTimePeriod(start, end):

- transition: startDate, endDate := start, end

29.4.5 Local Functions

None

30 MIS of Service Request Failure Interface

30.1 Module

Service Request Failure Interface

30.2 Uses

30.3 Syntax

30.3.1 Exported Constants

None

30.3.2 Exported Access Programs

Name	In	Out	Exceptions
displayErrorInfo	-	-	-

30.4 Semantics

30.4.1 State Variables

None

30.4.2 Environment Variables

win: 2D sequence of coloured pixels

30.4.3 Assumptions

None

30.4.4 Access Routine Semantics

displayErrorInfo():

- transition: win := Modify window so that it shows a warning to the user that their request has failed.

30.4.5 Local Functions

None

31 MIS of Image Upload Interface

31.1 Module

Image Upload Interface

31.2 Uses

31.3 Syntax

31.3.1 Exported Constants

None

31.3.2 Exported Access Programs

Name	In	Out	Exceptions
displayUploadImages		-	-

31.4 Semantics

31.4.1 State Variables

None

31.4.2 Environment Variables

win: 2D sequence of coloured pixels

31.4.3 Assumptions

None

31.4.4 Access Routine Semantics

displayUploadImages():

- transition: win := Modify window so that it allows users to upload images.

31.4.5 Local Functions

- validateImage(image): out :=

$\text{image.extension} \in \{\text{svg}, \text{jpeg}, \text{png}\}$

32 MIS of Report Interface

32.1 Module

Report Interface

32.2 Uses

Report Controller [33](#)

32.3 Syntax

32.3.1 Exported Constants

None

32.3.2 Exported Access Programs

Name	In	Out	Exceptions
displayStats	-	-	-

32.4 Semantics

32.4.1 State Variables

None

32.4.2 Environment Variables

win: 2D sequence of coloured pixels

32.4.3 Assumptions

None

32.4.4 Access Routine Semantics

displayStats():

- transition: win := Modify window so that it shows project specific statistics.

32.4.5 Local Functions

None

33 MIS of Report Controller

33.1 Module

Report Controller

33.2 Uses

Report Interface [32](#)

Report [34](#)

33.3 Syntax

33.3.1 Exported Constants

None

33.3.2 Exported Access Programs

Name	In	Out	Exceptions
getProjectStats	string	-	-
exportLabeledImages	-	-	-

33.4 Semantics

33.4.1 State Variables

- report: Report

33.4.2 Environment Variables

fm: External systems file manager

33.4.3 Assumptions

None

33.4.4 Access Routine Semantics

getProjectStats(projectID):

- transition: report := Report of statistics for project with projectID

exportLabeledImages():

- transition: fm := given labeled images to download to device.

33.4.5 Local Functions

None

34 MIS of Report

34.1 Module

Report

34.2 Uses

None

34.3 Syntax

34.3.1 Exported Constants

None

34.3.2 Exported Access Programs

Name	In	Out	Exceptions
getLabeledImages	-	list[Image]	-
getReviewedImages	-	list[Image]	-
getEndDate	-	Date	-
getTotalLabelers	-	int	-
getAccuracy	-	int	-
getClassCount	-	list[(string, int)]	-

34.4 Semantics

34.4.1 State Variables

- labeledImages: list[Image]
- reviewedImages: list[Image]
- endDate: Date
- totalLabelers: int
- accuracyOfLabelers: int
- classCount: list[(string, int)]

34.4.2 Environment Variables

None

34.4.3 Assumptions

None

34.4.4 Access Routine Semantics

getLabeledImages():

- output: out := labeledImages

getReviewedImages():

- output: out := reviewedImages

getEndDate():

- output: out := endDate

getTotalLabelers():

- output: `out := totalLabelers`

`getAccuracyOfLabelers()`:

- output: `out := accuracyOfLabelers`

`getClassCount()`:

- output: `out := classCount`

34.4.5 Local Functions

None

35 MIS of Project Selection Interface

35.1 Module

Project Selection Interface

35.2 Uses

Project Selection Controller [36](#)

35.3 Syntax

35.3.1 Exported Constants

None

35.3.2 Exported Access Programs

Name	In	Out	Exceptions
<code>displayActiveProjects</code>	-	-	-

35.4 Semantics

35.4.1 State Variables

None

35.4.2 Environment Variables

`win`: 2D sequence of coloured pixels

35.4.3 Assumptions

None

35.4.4 Access Routine Semantics

displayActiveProjects():

- transition: win := Modify window so that it shows all active projects and a small description of each.

35.4.5 Local Functions

None

36 MIS of Project Selection Controller

36.1 Module

Project Selection Controller

36.2 Uses

Project Selection Interface [35](#)

Project [29](#)

36.3 Syntax

36.3.1 Exported Constants

None

36.3.2 Exported Access Programs

Name	In	Out	Exceptions
getActiveProjects	-	-	-
selectProject	Project	-	-

36.4 Semantics

36.4.1 State Variables

- activeProjects: list[Project]

36.4.2 Environment Variables

win: 2D sequence of coloured pixels

36.4.3 Assumptions

None

36.4.4 Access Routine Semantics

getActiveProjects():

- transition: activeProjects := All projects marked as active in the project database

selectProject(project):

- transition: win := redirects users to labeling interface of that project

36.4.5 Local Functions

None

37 MIS of Labeling Interface

37.1 Module

Labeling Interface

37.2 Uses

Labeling Controller [38](#)

Image [39](#)

37.3 Syntax

37.3.1 Exported Constants

None

37.3.2 Exported Access Programs

Name	In	Out	Exceptions
renderPage	-	-	-
displayImage	Image	-	-
skipImage	-	-	-
selectLabelClass	-	-	-

37.4 Semantics

37.4.1 State Variables

- projectImages: list[Image]
- currImage: int
- currLabelClass: Enum[string]

37.4.2 Environment Variables

win: 2D sequence of coloured pixels

37.4.3 Assumptions

None

37.4.4 Access Routine Semantics

renderPage():

- transition: win := Modify window so that it shows labeling tools along with a picture to label.

displayImage(img):

- transition: win := Modify window so that the picture it is showing is img.

skipImage():

- transition: currentImage := (currentImage + 1) % projectImages.length
win := Modify window so that the picture it is showing is projectImages[currentImage].

selectLabelClass():

- transition: currLabelClass := the label class the user has selected on win.

37.4.5 Local Functions

None

38 MIS of Labeling Controller

38.1 Module

Labeling Controller

38.2 Uses

Labeling Interface [37](#)

Label ??

38.3 Syntax

38.3.1 Exported Constants

None

38.3.2 Exported Access Programs

Name	In	Out	Exceptions
getProjectImages	string	-	-
addLabel	Label	-	-
removeLabel	string	-	-
submitLabels	list[Label]	-	-

38.4 Semantics

38.4.1 State Variables

- labels: list[Label]

38.4.2 Environment Variables

None

38.4.3 Assumptions

None

38.4.4 Access Routine Semantics

getProjectImages(projectID):

- output: out := All images from project with projectID

addLabel(lbl):

- transition: labels := labels \cup {lbl}

removeLabel(lblID):

- transition: labels := $\{\ell \in \text{labels} \mid \ell.\text{id} \neq \text{lblID}\}$

submitLabels(lbls):

- transition: labels are sent to be added to the Label Database

38.4.5 Local Functions

None

39 MIS of Image

39.1 Module

Image

39.2 Uses

None

39.3 Syntax

39.3.1 Exported Constants

None

39.3.2 Exported Access Programs

Name	In	Out	Exceptions
getProjectID	-	int	-
getImageID	-	int	-
getDimensions	-	(float, float)	-
getImageData	-	binary	-

39.4 Semantics

39.4.1 State Variables

- projectID: int
- imageID: int
- width: float
- height: float
- imageData: binary

39.4.2 Environment Variables

None

39.4.3 Assumptions

None

39.4.4 Access Routine Semantics

getProjectID():

- output: out := projectID

getImageID():

- output: out := imageID

getDimensions():

- output: out := (width, height)

getImageData():

- output: out := imageData

39.4.5 Local Functions

None

References

- Carlo Ghezzi, Mehdi Jazayeri, and Dino Mandrioli. *Fundamentals of Software Engineering*. Prentice Hall, Upper Saddle River, NJ, USA, 2nd edition, 2003.
- Daniel M. Hoffman and Paul A. Strooper. *Software Design, Automated Testing, and Maintenance: A Practical Approach*. International Thomson Computer Press, New York, NY, USA, 1995. URL <http://citeseer.ist.psu.edu/428727.html>.

40 Appendix

[Extra information if required —SS]

Appendix — Reflection

[Not required for CAS 741 projects —SS]

The information in this section will be used to evaluate the team members on the graduate attribute of Problem Analysis and Design.

The purpose of reflection questions is to give you a chance to assess your own learning and that of your group as a whole, and to find ways to improve in the future. Reflection is an important part of the learning process. Reflection is also an essential component of a successful software development process.

Reflections are most interesting and useful when they're honest, even if the stories they tell are imperfect. You will be marked based on your depth of thought and analysis, and not based on the content of the reflections themselves. Thus, for full marks we encourage you to answer openly and honestly and to avoid simply writing “what you think the evaluator wants to hear.”

Please answer the following questions. Some questions can be answered on the team level, but where appropriate, each team member should write their own response:

1. What went well while writing this deliverable?
2. What pain points did you experience during this deliverable, and how did you resolve them?
3. Which of your design decisions stemmed from speaking to your client(s) or a proxy (e.g. your peers, stakeholders, potential users)? For those that were not, why, and where did they come from?
4. While creating the design doc, what parts of your other documents (e.g. requirements, hazard analysis, etc), if any, needed to be changed, and why?
5. What are the limitations of your solution? Put another way, given unlimited resources, what could you do to make the project better? (LO_ProbSolutions)
6. Give a brief overview of other design solutions you considered. What are the benefits and tradeoffs of those other designs compared with the chosen design? From all the potential options, why did you select the documented design? (LO_Explores)