Requirements Engineering 3RA3 Assignment 3 – December 8th 2015

Radhika Sharma- sharmarr
1150430

Question 1:

i) Inspector 1: Risk Management Role

This inspector is responsible for calculating all foreseeable risks and determining how large these risks are and under what conditions they can occur. This inspector will need to review nonfunctional requirements to come up with weighted measure of consequences and weighted measure of countermeasures. The result of having this inspector is to end up with a detailed report of all possible risks. In the context of the CyberFridge this inspector will make sure that food safety standards are followed and that the system is secure.

Mode	Conditions	
Food Expired	True	False
Temperature	CoolEnough	NotCoolEnough
Access	Denied	Allowed
PasswordCorrect	True	False

ii) Inspector 2: User Role

Responsible for checking that the functional requirements specified in the requirements document are met from the view of a user. This inspector will obtain information based on the guest interviews to evaluate the effectiveness of the CyberFridge at fulfilling the functional requirements.

Mode	Conditions	
FoodAdd	Allowed	NotAllowed
Temperature	AllowSet	DenySet
FoodDelete	Allowed	NotAllowed
RecipeAdd	Allowed	NotAllowed
CategoryAdd	Allowed	NotAllowed
CategoryRemove	Allowed	NotAllowed
RecipeDelete	Allowed	NotAllowed
FoodModify	Allowed	NotAllowed
RecipeModify	Allowed	NotAllowed
CateogryModify	Allowed	NotAllowed

iii) Inspector3: Repair person Role

This inspector is responsible for ensuring that the sensors of the CyberFridge work accurately and that the cooling system of the CyberFridge allows for the safe storage of food. This will be in conjunction with the functional and nonfunctional requirements because they must check that the system works within the boundaries of the nonfunctional requirements. The purpose is to ensure that the hardware of the CyberFridge is correct.

Mode	Conditions	
Food Sensing	Sensing	NotSensing
Temperature	CoolEnough	NotCoolEnough
Light	On	Off

iv) Implementation inspector

This inspector will be responsible for determining the feasibility of the system within the restraints of the nonfunctional requirements. This will include determining things like where the system performs searches in a timely manner or whether the system is secure. The focus should be on estimating the expected cost of the system to be and whether the nonfunctional requirements are realistic.

Question 2:

Elaboration for inspector 1 : Risk Management Role

1. Does the CyberFirdge cool the food to a sufficiently safe temperature?
2. How does the CyberFridge determine expiry dates?
3. How accurate are the expiry dates provided by the CyberFridge?
4. Does the CyberFridge notify the user when food has expired?
5. Does the CyberFridge remove expired food from the database?
6. Does the CyberFridge remove recipes from the suggested recipes containing the expired food until it is restocked?
7. Can the user create multiple accounts?
8. Do the accounts only allow access when the correct password s entered?
9. What does the system do when an incorrect password was entered 3 times? 5 times? 10 times?
10. Can the user reset their passwords?
11. Is the information stored on the CyberFridge encrypted?
12. Are outside entities able to access the CyberFridge information?

Question 3:

STABILITY LEVEL : HIGH

The following requirements were assigned to have a high stability level because they were directly related to the safety and security of the system.

- Security Requirements

◦ Confidentiality – A password is required to access personal information such as recipe interests, and to view any information remotely.

◦ Integrity – CARA shall allow only one user to modify the database at a time, while other users may view information

- CARA shall give the user a list of all food items currently in inventory ordered by user criteria

- CARA shall track removals from the current inventory via bar code scanner, or other means, including quantity removed

- CARA shall return information about any item requested by the user including but not limited to: if the item is on hand, quantity remaining, time remaining before item should be removed

- CARA shall require a password for all users

STABILITY LEVEL : MEDIUM

Rationale: The following list of requirements are assigned a stability level of medium because they are connected to the ease of use for the user.

- CARA shall provide a shopping list based on recipes the user wishes to make

- CARA shall be able to list food in an order based on food categories, alphabetical order, and time remaining before the items should be removed

- CARA shall maintain a database of all recipes which the user wishes to use

- CARA shall allow the user to view recipes by categories defined by the user

- CARA shall allow the user to create new categories or modify existing ones, or change which recipes belong to a category

- CARA shall allow the user to add new recipes to the database, and to place new recipes into existing categories

- CARA shall allow the user to modify or delete recipes from the database

- CARA shall allow the user to download recipes remotely from outside internet-connected servers

- CARA shall keep track of frequently prepared recipes 3

- CARA shall give to the user a list of suggested recipes according to user specified criteria including the following categories: special occasions, using certain foods, not using certain foods

- CARA shall allow the user to sort recipes by favorites, preparation time, and not used recently

- CARA shall be internet connected, and allow the user to access its functionalities remotely

• Look and Feel Requirements ◦ CyberFridge shall be aesthetically pleasant and outer surface should be easily cleaned

• Usability Requirements

◦ Ease of use – CyberFridge/CARA shall be easily used by children as young as 10

◦ Ease of learning – CyberFridge/CARA shall be easy for any user to interact with, regardless of their experience with technology

STABILITY LEVEL : LOW

Rationale : The following list of requirements were assigned a stability level of low because they do not directly affect the security of the CyberFridge System or the user friendliness of the CyberFridge System.

• Performance Requirements

◦ Speed Requirements – System-to-be shall respond to user actions within two (2) seconds

◦ Safety Critical Requirements – CyberFridge shall not leak coolant, or leave any electrical circuits exposed

◦ Precision Requirements – Quantities of food shall be accurate to within 1% of the maximum quantity

◦ Reliability and Availability Requirements – CyberFridge shall be available to use 24 hours a day, 365 days a year, just like a regular fridge

◦ Capacity Requirements – CyberFridge shall allow for up to 10 users, and should be able to store 100,000 recipes

• Operational Requirements

◦ Expected physical environment – CyberFridge shall be usable in both residential kitchens, commercial kitchens, or in any Ad-Hoc location the user wishes to place it

◦ Expected technological environment – CyberFridge shall assume that a home wireless network is present

◦ Partner applications – CyberFridge shall be able to interface with any HTML browser

• Maintainability and Portability Requirements ◦ Portability Requirements – CyberFridge is expected to be able to communicate with Windows, Apple, or Linux devices

• Cultural and Political Requirements ◦ CyberFridge shall be politically independent

• Legal Requirements ◦ The system-to-be shall allow any interference as required by law

Question 4:

	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14	R15	R16
R1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0
R2	1	0	1	1	1	1	1	1	0	1	1	1	1	1	0	0
R3	1	1	0	1	1	1	1	1	1	1	1	1	1	1	0	0
R4	1	1	1	0	1	1	1	1	1	1	1	0	1	1	0	0
R5	1	1	1	1	0	1	1	1	1	1	1	1	1	1	0	0
R6	1	1	1	1	1	0	1	1	1	1	0	1	1	1	0	0
R7	1	1	1	1	1	1	0	1	1	1	1	1	1	1	0	0
R8	1	1	1	1	1	1	1	0	1	1	1	1	1	1	0	0
R9	1	0	1	1	1	1	1	1	0	1	1	1	1	1	0	0
R10	1	1	1	1	1	1	1	1	1	0	1	1	1	1	0	0
R11	1	1	1	1	1	0	1	1	1	1	0	1	1	1	0	0
R12	1	1	1	0	1	1	1	1	1	1	1	0	1	1	0	0
R13	1	1	1	1	1	1	1	1	1	1	1	1	0	1	0	0
R14	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	0
R15	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
R16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0

Test cases:

T1 : Expired food removed or not

T2: Search internet for recipes

T3: Password Protection

T4: Sort of recipes

T5: Shopping List Provided

T6: Food item removed

	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14	R15	R16
T1	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0
T2	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0
T3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
T4	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0
T5	1	1	0	0	0	1	0	0	0	0	0	1	0	0	0	0
T6	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0

Question 5:

The engineer may have made this statement because to truly have a computer be secure, it would require that no one have access to the computer. This would defeat the purpose of having a computer and therefore it is impossible to have a secure computer that allows users access.

Question 6:

1. How much security clearance does each person need to access the system?
2. What security measures does the system have that I may not need?
3. How often does the system require connection to the internet?
4. What operations require access to the internet?
5. Is the information encrypted?
6. Does the system make use of a server?
7. If so, how is the server protected?
8. What information is stored where? (Is critical information stored on the server?
9. Can any information be remotely accessed?

Question 7:

a) Delete_all_rights(p,q,s)

Enter own into a[p,q]

Delete read from a[q,s]

Delete write from a[q,s]

Delete execute from a[q,s]

Delete append from a[q,s]

Delete list from a [q,s]

Delete modify from a[q,s]

Delete own from a[q,s]

End

b) Delete_all_rights(p,q,s)
If modify in a[p,q]

Enter own into a[p,q]

Delete read from a[q,s]

Delete write from a[q,s]

Delete execute from a[q,s]

Delete append from a[q,s]

Delete list from a [q,s]

Delete modify from a[q,s]

Delete own from a[q,s]

End

End

c) Delete_all_rights(p,q,s)
If modify in a[p,q] AND own NOT in a[p,s]

Enter own into a[p,q]

Delete read from a[q,s]

Delete write from a[q,s]

Delete execute from a[q,s]

Delete append from a[q,s]

Delete list from a [q,s]

Delete modify from a[q,s]

Delete own from a[q,s]

End

End

Question 8:

If any subject can have any writes to any other entity in the system, then the max set of rights for the entities within the system can acquire its rights over all other subjects in the system. If there are conditions then the max set of rights depends on the conditions.

Question 9:

System administrators are able to monitor that users are entering things into the system, however they are not allowed to see what is being entered into the system due to encryption. Stated another way, the administrators are able to see who is using the system but not what they are doing.

Question 10:

a) Paul has security clearance but not categorical clearance therefore cannot access {B,C}
b) Anna has both security and categorical clearance and can access {B,C} but Anna can only read {B,C} because she does not have confidential security clearance for {B} (Anna has a higher security clearance than the level she wants to access)
c) Jesse has both security and categorical clearance for {C} and can read and write to {C}
d) Sammi has both security and categorical clearance for {A,C} but can only read {A,C} because the security clearance is at a higher level (SECRET instead of CONFIDENTIAL)
e) Robin can only write to {B}

Question 11:

a) Eve can accomplish this by creating 2 new keys and replacing Bob and Alice's with the new key. She can then encrypt and decrypt intercepted messages with her own key and send them to Bob and Alice
b) Bob and Alice can detect this if Eve misses a message and it gets sent with the original encryption. From this, Bob and Alice can figure out the new key

Question 12:

It was a bright cold day in April and the clocks were striking thirteen.

Question 13:

Ka = 13^(3) mod 53 = 24

Kb = 13^(5) mod 53 = 28

Sba = X^(5) mod 53 = 10

Sab = Y^3 mod 53 = 10

Question 16 :

Uvkjrr vt xjixbg kenywey kbwhb

Question 17:

It was a bright cold day in April and the clocks were striking thirteen.