Faculty of Science and Technology
420-436-VA | System Development

DELIVERABLE 2

&

DELIVERABLE 3

Due Date:
Monday, September 16, 2024

Red Team
Amir-Georges
Douyon
Raeeba
Grechelle

Client: Georges AMO
Contact Name: Georges

SIGNATURES

We certify that this assignment is our own work.

I, **Amir-Georges,** certify that I have contributed to this deliverable, A

I, **Douyon,** certify that I have contributed to this deliverable, D

I, **Grechelle**, certify that I have contributed to this deliverable, G

I, **Raeeba**, certify that I have contributed to this deliverable, R

TABLE OF CONTENTS

EXECUTIVE OVERVIEW

In this deliverable, we determine the specific features of our system based on the client's needs. To do so, we examined the client's business problem, domain, environment, as well as his computer skills to get a better idea of his current situation. This will help us better understand his technological needs regarding the system he would like for us to create.

To get the aforementioned information, we first formulated specific, closed questions to ask the client regarding the functioning of his business. We then interviewed the client using these questions and asked for additional clarification once new information came to light–the open questions.

Using the information we obtained, we created 15 user stories, each detailing a specific feature that will be included in our system. These user stories are based on the current functioning of the client's business as well as requested improvements to be made to the latter. We created one story test for each user story using Gherkin syntax to ensure each feature can be properly tested. Additionally, we list all user stories at the end of our deliverable to give a preview of the product backlog, as well as our updated project plan for this deliverable.

BUSINESS

DESCRIPTION OF THE BUSINESS DOMAIN

The construction industry significantly contributes to the Canadian economy by driving job creation and societal development. It encompasses the development of a wide range of infrastructure and buildings, including commercial structures, residential properties, industrial facilities, roads, bridges, and public buildings. The industry is currently evolving with advancements in sustainable building practices, focusing on eco-friendly solutions. This includes adopting low-carbon, high-performance technologies, and building materials, as well as following climate-resilient building construction guidelines (*Value of the Industry*, n.d.).

The client's company operates within this industry, specializing in residential construction and renovation projects. With the goal of exceeding customer satisfaction, the company provides reliable and professional services emphasizing sustainable solutions to help realize its client's projects (*AmoLinat*, n.d.). Their primary clients are homeowners seeking to enhance and improve their living spaces. The company's expertise in high-quality construction practices and renovation reflects its commitment to advancing the industry's standards and meeting client expectations.

DESCRIPTION OF THE BUSINESS ENVIRONMENT

In the construction industry, the demand for skilled professionals is very high. Currently, our client's company operates with a single employee and is supported by suppliers such as Home Depot, Reno Depot, and Rona. The company primarily has male clients for construction services, but it also has a significant number of female clients for renovation projects. Our client is equipped with all the necessary technology to aid his work and there appears to be no immediate need for additional technological advancements. The company faces minimal competition due to its specialized focus. Most competitors are larger companies engaged in building

condos and acquiring new land, leaving a gap in the market for specialized renovation services. The competition in the renovation sector is relatively low since construction workers are more focused on the aspect of creating entire new buildings instead of renovating. This gives our client a competitive edge in the renovation market. This information has been provided by our client since he has the most knowledge about his environment.

DESCRIPTION OF THE CLIENT

Our client's name is Georges. He runs a construction business called Georges AMO, in Laval, where he renovates and builds rooms from the ground up or does terrain adjustments. The client's business has its own website called amoLinat where its clients can make submissions for a renovation project as well. His skills in construction, renovation, and excavations are very well handled and made with precision and care. When it comes to computer skills, they are pretty limited since he has not grown up with technology as much as the current generation has. He has above-average knowledge in Excel but that's his only knowledge of IT.

BUSINESS PROBLEM

The client is dissatisfied with his current inventory management system, which relies on an inefficient process built in Excel. His current inventory system consists of multiple spreadsheets filled with a large volume of supply data, but lacks proper filtering and categorization of materials, making it difficult to manage and track inventory effectively. Consequently, this reduces the client's productivity and leads to frustration as the client will have to look through numerous rows of data to locate necessary materials. As the business expands, managing inventory will become even more challenging.

We aim to address these challenges through our web application, which will optimize the business's inventory management. Additionally, since the Excel spreadsheets contain essential formulas and perform necessary calculations for

construction, the web application will feature an integrated calculator to handle these calculations, enhancing both convenience and efficiency.

QUESTIONS

NARRATIVE FOR OPEN QUESTIONS

With the client's current inventory system, we know that he uses multiple Excel spreadsheets to keep his inventory and the formulas needed to construct rooms. The spreadsheet containing the inventory presumably contains the names of each material (i.e., wood, screws, glue, tape, and wool) as well as the remaining quantity of said material. However, we're not sure how often the client updates the inventory to reflect the actual quantity of materials left. We also do not know where he buys his materials from.

In terms of the formulas he uses, we assume that they are used to calculate how much material is needed to cover the walls of a room. However, we're not sure what the exact formulas are or what exactly he uses them for.

QUESTIONNAIRE

The questionnaire is divided into four (4) categories:
- Application questions
- Login questions
- Inventory questions
- Room Calculator questions

Below you will find the questionnaire as well as the client's answers. Open questions are written in bold.

APPLICATION QUESTIONS
1. How knowledgeable are you and your employees about IT? He has some knowledge of IT. He's capable of using Microsoft Excel quite well, as he uses it for managing inventory and performing calculations for his business. However, his business partner, the only other worker in his company, does not have much knowledge of IT.
2. What software are you currently using? He currently only uses Excel. He has two spreadsheets for each job: one for his inventory and one for his calculations (floor, wall, and roof calculations).
3. How is your business organized? The client and his partner currently do the same tasks (accounting, administration, managing, marketing, searching for jobs, placing orders for materials & supplies). The client is the one who focuses on the construction.
4. How do you operate right now (as far as your inventory)? He uses an Excel spreadsheet for his inventory. The spreadsheet contains the name of each item, as well as the quantity of that item he has in stock. In case of technical difficulties, he also sometimes just uses his memory to keep track of his inventory.
5. Do you buy your supplies jointly with another home renovation store location? Yes, he buys them at Home Depot, Patrick & Morrin, Canac, Barette, and Reno Depot.
6. Do you want to have a list of your current vendors/suppliers? Yes, he wants to have a list of his current vendors. The client always orders supplies online.
7. Apart from the inventory management and room calculator, do you have other features you want?

No, he does not want any other features. The inventory system and room calculator are the main features he needs. Floor and roof calculations are not a priority currently.

LOGIN QUESTIONS

1. Are you the only admin?

    He's the only admin. He's the only one who orders supplies.
    The employees' access is limited to viewing the inventory, they should not be able to modify it.

2. **(Open Question) | Can the employees also use the room calculator?**

    Employees can use the calculator.

3. Do you want to be able to add more admins?

    Yes. So that if he hires more employees in the future, they will also be able to view the inventory, and use the room calculator if necessary.

INVENTORY QUESTIONS

1. What information do you need for the materials for the inventory (product details such as height, length, weight, vendor/s, and amount in stock)?

    The material he needs, and the quantity of it remaining in stock. The quantity would be written in terms of the unit of measurement of the material. For example, he wants the number of bags of wool insulation and the number of tubes of glue. The weight of each material is not important for him to know.

2. **(Open Question) | What will be in the inventory?**

    The main materials and supplies he needs to have listed in the inventory are lumber, wool insulation, screws, silicone, tape, insulating membrane, and glue.

3. **(Open Question) | Do you need to have information about the manufacturer/supplier in the inventory?**

420-436-VA System Development

Yes, he would like to know which items are being sold by which retailer, so that he can know if a material is only sold by a specific retailer. He also would like to see the price of each material at each retailer, so that he can compare the prices between different stores.

4. What different types of inventories do you have?

He only has one inventory, which contains the remaining quantities of each material or supply of each size.

5. How frequently do you update your inventory?

After every purchase and after he completes a job.

6. **(Open Question) | Would you update it while you're doing construction?**

No, it's not necessary to do so.

7. Do you want to have a notice that says a material is low in stock/out of stock?

Yes, but only for certain materials like screws, tapes, silicone, membrane, and glue. For wood and insulating wool, it would not be necessary.

8. What do you consider as high and low stock?

- Screws: 5 boxes,
- Tapes: 12 tapes,
- Membrane : 3 membranes,
- Silicone: 12 tubes,
- PL (glue): 12 tubes or 1 box.

9. **(Open Question) | How do you want the inventory update to work?**

He wants the system to give a warning when deleting an item, or when updating stock or item information. The program will ask the client to confirm the modification when updating the inventory.

ROOM CALCULATOR QUESTIONS
1. Can you provide all the formulas for the room calculator?
Yes, he can give them to us at a later date.
2. What does the room calculator calculate?
It would calculate the following two quantities: 1. The amount of lumber needed to construct a wall   2. The amount of wool insulation needed to fill a wall
3. **(Open Question) | What information would you provide/already know?**
He would provide the room calculator with the following information: - Length of the wall,   - Height of the wall,   - Thickness of the wall (would be used to determine the thickness of the lumbers and the wool insulation),   - Spacing between the lumbers   This information is needed to calculate the amount of lumber needed to construct a wall as well as the amount of wool insulation needed to fill said wall.   (For example, if the wall is 400 ft squared, you would need to buy 20 bags of 20 ft squared wool insulation. Then, you need to make sure that the thickness and width of the wool insulation are okay.)   Additionally, if the wall is a load-bearing wall it requires three numbers placed horizontally in its interior. If it's not load-bearing, it only requires two.
4. **(Open Question) | What different types of wool insulation are there? How do you determine which one to buy?**
All wool insulation are almost all the same, but their thickness differs. The wool bought also depends on the space that needs to be covered.   Generally, most wool insulation is 48 inches in height, and the width is dependent on the

spacing of the lumbers and the thickness of the wool depends on the thickness of the wall.
5. Does the room calculator only calculate the amount of materials needed?
Yes.
6. Do you want to calculate the total amount of items based on the dimensions of the room/floor?
Yes.
7. After calculations, do you want to see if the material you need is in the inventory and prompt you to order more if that material is low in stock?
Yes, with the specific quantity of each material and supply. No, prompting would not be necessary.

APPENDIX 1

To obtain the user stories, we prepared questions to ask the client based on what we know and did not know about the functioning of his business. This knowledge was acquired by viewing the client's website (*AmoLinat*, n.d.) and by asking Amir, as he has a general understanding of the functioning of his father's business.

Our questions were split into four (4) categories depending on their features. The four types of questions asked were general questions about the application as well as login, inventory, and room calculator questions. We then interviewed our client with these closed questions to get insight into what he needs the application to do. We also asked questions related to the usage of his web application. Finally, we asked additional, open questions when necessary.

For example, when asking about the room calculator feature, the client mentioned how he needs to be able to calculate the amount of lumber needed to construct a wall. This led us to ask him for more clarification regarding how a wall is constructed as we were unaware of the exact materials used in the process, and eventually, asking him what information he would provide the calculator to find out the exact amount of lumber he needs.

Finally, since the client only speaks French, it was decided that Amir and Raeeba, the only French speakers, would be conducting the client meeting alone. Thus, Douyon and Grechelle were not present for the meeting, as they would not have understood what the client was saying.

After obtaining the client's answers to the questionnaire, we began creating the user stories by determining which features we would be able to implement within the application. One of the client's wishes was to display the prices of each material in the inventory at each retailer that supplies said material in the application. For example, if he indicated to the application that he supplied his quarter-inch screws from Home Depot and Rona, he would like the application to then show the prices of those screws at both Home Depot and Rona. He could then compare the prices. This would be useful for buying supplies, as he could quickly find out which retailer sells each supply for the lowest price. We determined that this feature would not be possible to implement with our current skills and within the project's time constraints, as we do not have access to the proper API's containing the prices of each item sold at each retailer the client supplies his materials from. In fact, we were able to find an API for Home Depot (*The Home Depot API*, n.d.), however, we could not find any for his other suppliers like Canac. Thus, there is no user story concerning this feature, as it will not be implemented.

See Appendix 2 for product backlog - all user stories and story tests.

APPENDIX 2

Below you will find the user stories and story tests for this project. Each table is separated into two columns for the user story and story test respectively. The columns themselves are separated into three rows following the user story format ("as a…, I want…, so…") for the user stories and Gherkin syntax for the story tests. Thus, please read each column from top to bottom.

TITLE	
1. Super Admin Login	
USER STORY	**STORY TEST**
As a super admin,	Given that the user exists in the database and is marked as a super admin,
I want to be able to log into the application and use the super admin features (e.g., view and update inventory, add and remove items, use room calculator, add and remove employees).	when the user enters their email and password,
So, a login system for super admins is needed.	then the user will be able to access the super admin application.

TITLE	
2. Regular Admin Login	
USER STORY	**STORY TEST**
As a regular admin,	Given that the user exists in the database and is marked as a regular admin,

I want to be able to log into the application and use the regular admin features (e.g., view inventory, use room calculator).	when the user enters their email and password,
So, a login system for regular admins is needed.	then the user will be able to access the regular admin application.

TITLE	
3. 2-Factor Authentication	
USER STORY	**STORY TEST**
As a super admin / regular admin,	Given that the user exists in the database,
I want to make sure that the system's login is secure to prevent unauthorized persons from accessing it.	when the user enters their email and password and clicks on "Login" with the correct information,
So, a 2-factor authentication system is necessary.	then, the system will send a code to the user's email address. The user must then write the code in the application, the code written must match the code sent to their email.

TITLE	
4. Change password	
USER STORY	**STORY TEST**
As a super admin / regular admin.	Given the user exists in the database,
I want to be able to change my password in case I forget it.	when the user enters their email and password and clicks on "Forgot my Password",
So, a password recovery system is necessary.	then, a link to change their password will be sent to their email. After confirming their new password, the database will be updated with the new

password.

TITLE
5.   View inventory

USER STORY	STORY TEST
As a super admin / regular admin,	Given an item and its quantity is in the database,
I want to keep track of the amount of items there are in stock to avoid buying items unnecessarily.	when the user clicks on the Inventory tab,
So, I need an inventory system.	then they can view the quantity of that item in the database.

TITLE
6.   Search for item in the inventory

USER STORY	STORY TEST
As a super admin / regular admin,	Given an item and its information is in the database,
I want to be able to search for a specific item in the inventory.	when the user clicks on the search bar in the Inventory tab and writes the item's name,
So, I need a search bar.	then a page containing the item's information will be displayed.

TITLE
7.   Update inventory quantity

USER STORY	STORY TEST
As a super admin,	Given the user knows which item they want to update,

I want to be able to update the amount of each item I have after purchasing more, and after every completed job.	when the user clicks on "Update Stock" and selects the items to be edited,
So, I need a way to quickly update the stock of each item.	then, a new page with the selected items will appear. The super admin can then change the stock. When they click on "Update", the quantity of each item will be updated in the database.

TITLE	
8. Add new item to inventory	
USER STORY	**STORY TEST**
As a super admin,	Given the user knows which item's stock they want to update,
I want to be able to add a new item to the inventory if it's not already present.	when the user clicks on the "Add Item" button,
So, a feature to add a new item must be implemented.	then, new fields will appear prompting the client to input the item's information (e.g., name, supplier, quantity, low stock indicator). After clicking "Confirm", the item will be added to the database.

TITLE	
9. Update item information	
USER STORY	**STORY TEST**
As a super admin,	Given the user knows which item they wants to update,
I want to be able to update the information of each item in case I entered the wrong information or	when the user clicks on "Edit Item Information" and selects the item to be edited,

changes occurred (e.g., item is no longer sold at a specific manufacturer).	
So, there must be a way to modify item information in the inventory.	then, a new page with the selected item will appear. They can then change the item information, when they click on "Update", the item information will be updated in the database.

TITLE	
10. Remove item from inventory	
USER STORY	**STORY TEST**
As a super admin,	Given the user knows what they wants to remove,
I want to be able to remove an item from the inventory, if it is no longer necessary	when the user selects the items to be deleted, and clicks "Delete Item",
So, I need a way to delete items from the inventory.	then a warning will appear asking if they are sure they want to delete the item, and once they click confirm, the item will be removed from the database.

TITLE	
11. Low Stock Alerts	
USER STORY	**STORY TEST**
As a super admin,	Given the user enabled "Low Stock Alert" for an item in the item's information,
I want to know if I have less than a certain amount of a specific item in the inventory, but I don't want to get repeated notifications.	when the quantity in the database is below the set amount,

| So, I need a way to see when an item is low in stock. | then, the item will be highlighted in red in the inventory and it will be displayed in a section dedicated to low stock items. |

TITLE	
12. Lumber Calculations	
USER STORY	**STORY TEST**
As a super admin / regular admin,	Given the necessary information has been provided to the user,
I want to calculate the amount of lumber I need to construct a wall.	when the user inputs that information into the calculator,
So, I need a way to calculate the amount of lumber needed.	then, the amount of lumber needed for a construction project will be given.

TITLE	
13. Wool Insulation Calculations	
USER STORY	**STORY TEST**
As a super admin / regular admin,	Given the necessary information has been provided to the user,
I want to calculate the amount of wool insulation I need to fill a wall.	when the user inputs that information into the calculator,
So, I need a way to calculate the amount of wool insulation needed.	then, the amount of bags of wool insulation needed for a construction project will be given.

TITLE	
14. Add new users	
USER STORY	**STORY TEST**

As a super admin,	Given a new person is hired,
I want to be able to add new employees to the system, so that they can use the application for work (view inventory, use room calculator).	when the user clicks "Add/Remove Employee" in the navigation menu,
So, I need a way to provide new employees access to the application.	then, they will be prompted to enter the employee's info. After clicking "Add employee", the employee will be added to the database.

TITLE	
15. Remove users	
USER STORY	**STORY TEST**
As a super admin,	Given a person no longer works for the company,
I want to be able to remove employees from the system, if they no longer work for my company.	when the user clicks "Add/Remove Employee" in the navigation menu,
So, I need a way to remove employees' access to the application.	then, they can enter the employee's name, click "Remove Employee" and the employee will be removed from the database.

NARRATIVE DESCRIPTION

The primary users the system will have are the Super Admin and Admin. The system allows for only one Super Admin but can have multiple Admins. Both the Super Admin and Admin are required to log in using their email and password to access the system's features. After entering their credentials, they will receive a verification code sent to their registered email. If the code entered in the program

matches the code sent via email, they will be granted access. In case of a forgotten password, users can click on the "Forgot my Password" button. The program will then ask them for their email address, after which a password reset link will be sent to their email. Users can follow the link to create and confirm a new password, which will update the database with their new credentials.

The Super Admin is the main user with unrestricted access to all features of the application which includes the inventory system (updating, deleting, and modifying the inventory), the calculator, and admin user management (adding more Admins). Within the inventory system, the Super Admin can add and update materials and material information such as material name, width, height, stock, vendor details, and price. The Super Admin will update the inventory after every purchase and after every job completion. When modifying or deleting an item in the inventory, the program will prompt the Super Admin to confirm the changes. If an item is low or out of stock, the inventory system will notify the application by displaying these items in bold with a red border. An expandable table listing all of the low and out-of-stock items will be featured at the top of the Inventory page to group this category together.

The Admin users have restricted access to the application. They can view the inventory, but they cannot modify any information. Admins also have access to the calculator just like the Super Admin. In the Calculator, the users need to provide the length, height, and thickness of the wall as well as the spacing between the lumbers and the system will generate the number of materials based on these dimensions.

The Calculator is for informational and visual purposes only—it allows users to see how many materials they currently have on hand, but it will not purchase items nor send the calculated results via email. The Calculator will also display specific inventory items related to wall construction, limited to wool insulation and wood, showing the available stock for these materials. By integrating the inventory feature into the Calculator, the user experience is streamlined, making it more convenient by eliminating the need to open another page to view the primary materials required for wall construction.
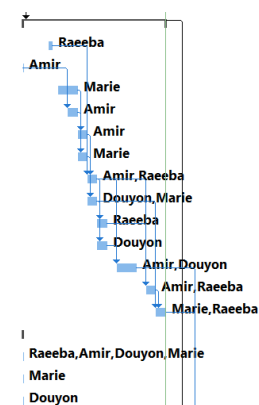
UPDATED PROJECT PLAN

During one of our team meetings, we were told that both the deliverables #2 and #3 would be merged into one deliverable. So, we included all points from both deliverables, except Appendix 3 from Deliverable #3, into this report.

While working on this deliverable, we had to change the people assigned to certain tasks, after learning more about what the tasks entailed. Grechelle and Douyon, previously in charge of the open questions, were assigned to the questionnaire. This was done after we learned that the open questions were supposed to be asked during the client meeting, which Grechelle and Douyon could not participate in, as they do not speak the same language as the client. Raeeba and Amir, previously in charge of the closed questions, were then assigned to the open questions. Additionally, Grechelle and Amir switched Appendix tasks (they were assigned to complete Appendix 2 and Appendix 3 respectively) after Grechelle had to miss a team meeting for health reasons.

All details and changes can be seen on our GitHub in our Project Planner file: [raeeba/Red-Team: System Development Team Project (github.com)](github.com).

Here is the updated planning for this delivery.

Deliverable 2 & 3	12.69 days	Fri 8/30/24	Fri 9/13/24	2	
Executive Overview	2 hrs	Mon 9/2/24	Mon 9/2/24		Raeeba
Front matter	10 mins	Fri 8/30/24	Fri 8/30/24		Amir
Business environment	2 days	Tue 9/3/24	Wed 9/4/24		Marie
Business domain description	1 day	Wed 9/4/24	Wed 9/4/24	10	Amir
Client description	1 day	Thu 9/5/24	Thu 9/5/24	12	Amir
Business problem	1 day	Thu 9/5/24	Thu 9/5/24	11	Marie
Open Questions	1 day	Fri 9/6/24	Fri 9/6/24	9,13	Amir,Raeeba
The questionnaire	1 day	Fri 9/6/24	Fri 9/6/24	14	Douyon,Marie
Summary description	1 day	Sat 9/7/24	Sat 9/7/24	15	Raeeba
Business problem	1 day	Sat 9/7/24	Sat 9/7/24	16	Douyon
Narrative Description	2 days	Mon 9/9/24	Tue 9/10/24	18,15	Amir,Douyon
Appendix 1	1 day	Thu 9/12/24	Thu 9/12/24	15,17	Amir,Raeeba
Appendix 2	1 day	Fri 9/13/24	Fri 9/13/24	20,16	Marie,Raeeba
Documentation	0.06 days	Fri 8/30/24	Fri 8/30/24		
references	30 mins	Fri 8/30/24	Fri 8/30/24		Raeeba,Amir,Douyon,Marie
Bibliography	30 mins	Fri 8/30/24	Fri 8/30/24		Marie
Spelling	30 mins	Fri 8/30/24	Fri 8/30/24		Douyon

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