

Warehouse Management System

Process Report

SEP-2

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Before

Project Description

Background Description

In the past, keeping track of the inventory was more paper work than it is nowadays (Advameg, Inc., 2016). Keeping an accurate record of the stock inventory was always challenging and that is why warehouse management systems were introduced. A warehouse must be in control of its operations in order for it to be successful; and the loss of inventory would not help (UK Essays, November 2013). To control the warehouse's operations, technology plays a vital role to help maximize the organization's potential (UK Essays, November 2013). Moving from manual, time consuming work which is exposed to human error, to dynamic and effective systems that can handle more work simultaneously, would be more beneficial to the warehouse as it is a more accurate solution to keeping track of the inventory.

According to Scanco Warehouse which was the first warehouse to implement a management system to work on the cloud, there are five most common challenges/problems that are faced when dealing with a warehouse; four of which are relevant to and could be minimized if a warehouse management system would be implemented (Scanco, 2013).

The first challenge is inventory location (Scanco, 2013). If pickers are not aware of the location of the item they should be packaging then it would be a domino effect from there; it would be time lost due to pickers looking for the item which would then delay the distributors since the packaging would not be ready in time.

The second challenge is inventory accuracy (Scanco, 2013). If there is no way to keep track of the inventory then there would either be a surplus of items that would eventually go to waste (if expired) or a shortage of items which would again cause delay in distribution.

The third challenge is redundant processes (Scanco, 2013). Again this challenge results in time loss and causes a lag in efficiency of the workers. For example, if the system is not accurate, two pickers may receive the same order and therefore do double the work that is required.

The fourth and final challenge is picking optimization (Scanco, 2013). Pickers' jobs can be made much easier if they had the right technology. For example, if the picker had a device to direct him/her to the item's location, the entire process would be sped up hence being time efficient.

All these challenges that could be easily faced at a warehouse can be solved and

avoided by using a warehouse management system.

Creating a warehouse management system would help facilitate the workload around a warehouse. Firstly, a system would help employees keep track of the merchandise that has been received from suppliers and the merchandise that is sent to clients in conformance with their orders. Secondly, it would help employees keep track of the expiration dates of the products (if any). It would make it easier for them to send out, not the new products they just received, but the ones that they already had in stock. Having a warehouse management system would minimize workload and save the company expenses. A warehouse management system would be instantly effective in terms of calculating the total price for an order, or even if any update occurs, everyone on shift would be notified on the spot. By implementing a system, a company would be eliminating as much human error as possible.

Purpose

The purpose is to help businesses maintain an accurate inventory of their goods.

Problem formulation

- a. How can we help business owners manage the goods and reduce costs?
- b. How can we centralize all the orders from clients?
- c. How can we have an accurate inventory of the stocks?
- d. How will we guide the employees to the correct position where the product is located?
- e. How will we eliminate redundancy in data management?
- f. How are we going to manage the different clients accessing the system?

Delimitation

Development

- i. Hardware
 1. Devices that are directing the pickers.
- ii. Software
 1. Keeping track of employees' personal information
 2. Assigning pickers to orders.

Choice of Model and Method

What Partial problem	Why Why study this problem?	Which Which models/theories are expected to be used to solve the problem?
How can we help business owners manage the goods and reduce costs?	It's interesting because a business owner can see how much he/she can save by implementing a system that manages the company's goods.	The process of managing the goods begins with receiving the goods from suppliers, adding them to the inventory, receiving orders from customers and subtracting the goods from the orders from the inventory. This will be shown through use case modelling.
How can we centralize all the orders from clients?	This problem is interesting to study because it creates organization within the warehouse and its clients.	Using a client/server architecture and design patterns. The clients will send orders to the server where the orders are handled and saved to the database.
How can we have an accurate inventory of the stocks?	It's interesting because you can prevent the shortage or surplus of products in the inventory.	Based on calculations on the server side of the program that requests the information from the database.
How will we eliminate redundancy in data management?	It's interesting because it will reduce human error by having the system dealing with giving out orders.	We make sure each order is given out only once using the state pattern and giving the orders different statuses.
How are we going to manage the different clients accessing the system?	This is interesting because the different clients should have different privileges when accessing the system.	This will be implemented using the proxy design pattern and creating different interfaces for the different types of clients.

Time Schedule

Our estimated work time is 22 days, 8 hours per day. The time schedule is based on the theories of UP and the framework of SCRUM. The project is divided into the following four phases:

- Inception Phase: 16.11.2016 – 25.11.2016
- Elaboration Phase: 28.11.2016 – 30.11.2016
- Construction Phase: 01.12.2016 – 13.12.2016
- Transition Phase: 14.12.2016 – 16.12.2016

Group Policy

Rules

1. Attend meetings regularly from Monday to Friday at VIA.
2. If you are unable to attend the meetings, you should notify the team as soon as possible.
3. All members must complete their given part of work by given deadlines.
4. If one team member is not able to complete the task given to him/her, then they should notify the other members and ask for help. The team member will receive help to a certain extent, otherwise, the task will be reassigned.
5. Respect other member's ideas.
6. The members must be willing to present their ideas in a respectful way and they should not be afraid to say anything and be aware of the fact that the team is only as strong as its weakest point.

Consequences

Failure to bind to the above rules, you will be notified twice before you are called to a meeting with the supervisors and a decision will be made based on the meeting.

I agree to all of the above and promise to work at the best of my ability.

Bashar Gabbara (246678)

Bianca Sgondea (240312)

Mihai Cristian Pavel (245485)

Tamara Hassan (247581)

Individual SWOT

Bashar Gabbara	
Strengths	Weaknesses
<ul style="list-style-type: none"> -JAVA programming skills -Love to learn -Working hard under pressure -Appreciate team work -No giving up -Persistence -Creative -Dedicated 	<ul style="list-style-type: none"> -Overloading myself with tasks -Get distracted with other people's talks/ more focused alone -Perfectionist which leads to stress -Don't take rests/breaks
Opportunities	Threats
<ul style="list-style-type: none"> -Being part of a good team which aims for best -help each other in group -exchange ideas - utilize my skills and knowledge - apply the framework of SCRUM and Unified Process 	<ul style="list-style-type: none"> -Get tired and lose focus because of not having enough sleep -Get sick -Get busy in helping each other and fall behind with own tasks -Eclipse misbehaving / laptop breakdown

Bianca Sgondea	
Strengths	Weaknesses
<ul style="list-style-type: none"> • Hardworking • Tolerant • Serious • Flexible • Positive 	<ul style="list-style-type: none"> • Shy • Impatient • Very sensitive • Stressing • Low presentation skills • Procrastinating
Opportunities	Threads
<ul style="list-style-type: none"> • Improving: <ul style="list-style-type: none"> ○ programming skills ○ team working ○ presentation and communication skills ○ punctuality • Learning how to manage time more effectively • Learning to work with SCRUM and AUP 	<ul style="list-style-type: none"> • Stressed by deadlines • Distracted by external factors • Overthinking • Coldness • Unpunctuality

Mihai Cristian Pavel	
Strengths	Weaknesses
<ul style="list-style-type: none"> - Very good java programming skills - Punctual and committed - Quick learner - Achiever - Ambitious 	<ul style="list-style-type: none"> - I lose my temper when I feel that things are not on the right path - Fear of failure - Lack of writing report skills - Lose track of the important point sometimes
Opportunities	Threats
<ul style="list-style-type: none"> - Improve my report writing skills - practice implementing scrum framework in a real project - use Agile Unified Process in our software development framework - Improve team-work skills 	<ul style="list-style-type: none"> - Family duties

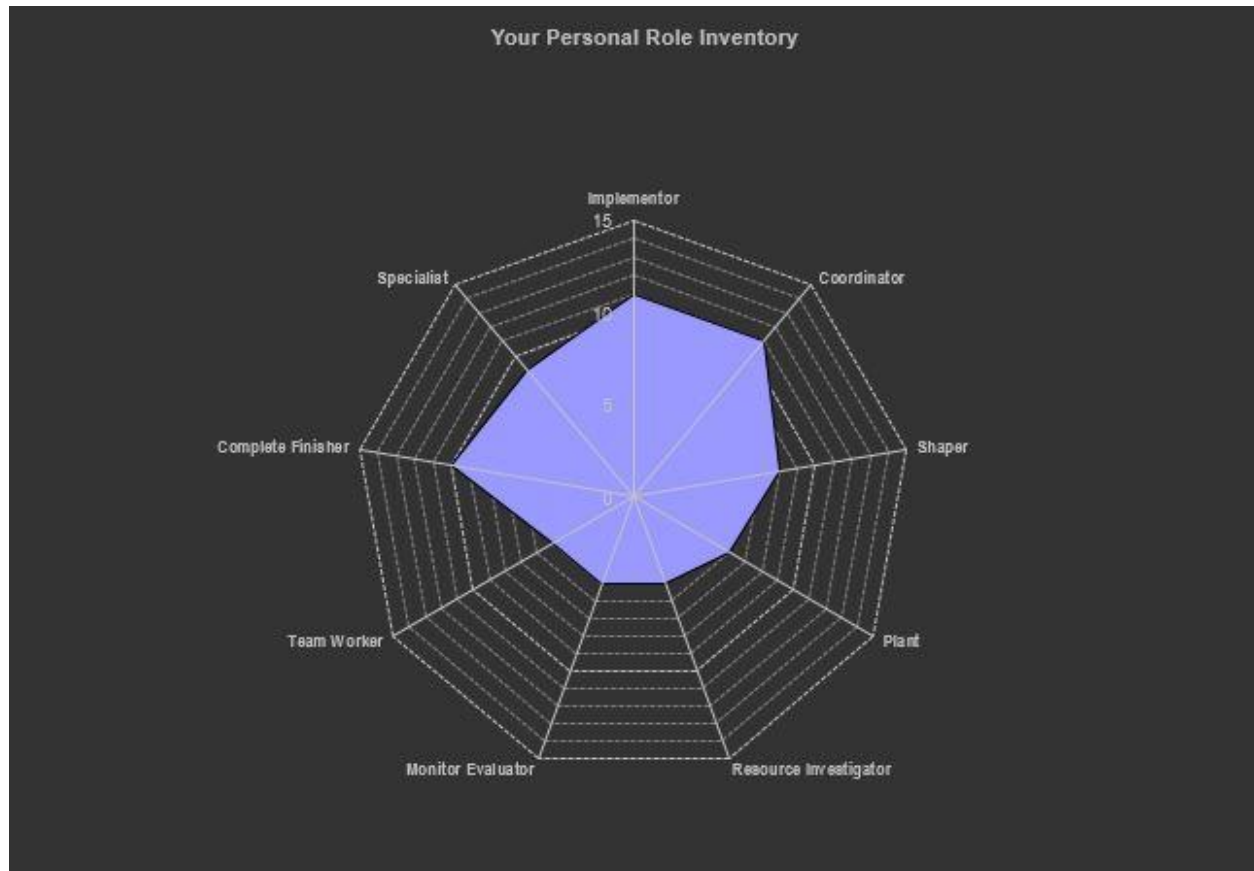
Tamara Hassan	
Strengths	Weaknesses
<ul style="list-style-type: none"> - Organized - Time management skills - Perfectionist - Eager to learn about things I don't know about - I can agree to disagree 	<ul style="list-style-type: none"> - Leadership skills - Short focus periods
Opportunities	Threats
<ul style="list-style-type: none"> - Put knowledge into practice (combining the objectives we learned into one project) - Working with a hard working group - Working on a real-life scenario - Coming up with our own idea for a project and learning how to implement it from the start - Implementing UP and Scrum framework 	<ul style="list-style-type: none"> - Illness - Computer/software malware - Eclipse crashing

Team SWOT

Entire Team	
Strengths	Weaknesses
<ul style="list-style-type: none"> - Hard working - Perfectionists - Eager to learn - Open to help out others - Committed to the task at hand - Communicate effectively - Appreciate team work - Good Java programming skills 	<ul style="list-style-type: none"> - Distracted easily by going off topic - Stressed by the workload and perfectionism
Opportunities	Threats
<ul style="list-style-type: none"> - Apply our knowledge from this semester to our project - Coming up with our own ideas for a project - Applying SCRUM and UP frameworks to improve our software development skills - Gaining research skills 	<ul style="list-style-type: none"> - Family duties - Computer software malfunction – Eclipse crashing - Sickness

Belbin Analysis

Bashar Gabbara



Section	Total									
I	1	0	2	1	1	1	1	1	2	
II	3	5	0	1	0	0	0	1	0	
III	1	1	1	2	1	1	1	1	1	
IV	2	1	1	0	1	0	1	2	2	
V	1	1	1	1	1	1	1	1	2	
VI	1	1	2	0	1	1	1	2	1	
VII	2	2	1	1	0	1	0	2	1	
Total	11	11	8	6	5	5	5	10	9	

Roles	
→ Implementor	11
→ Coordinator	11
Shaper	8
Plant	6
Resource Investigator	5
Monitor Evaluator	5
Team Worker	5
Complete Finisher	10
Specialist	9

Bashar is an implementer and a coordinator. Those are his strongest points from all of the above. An implementer is needed to plan a workable strategy and carry it out as efficiently as possible.

Strengths: Practical, reliable, efficient, turns ideas into actions, and organizes work that needs to be done.

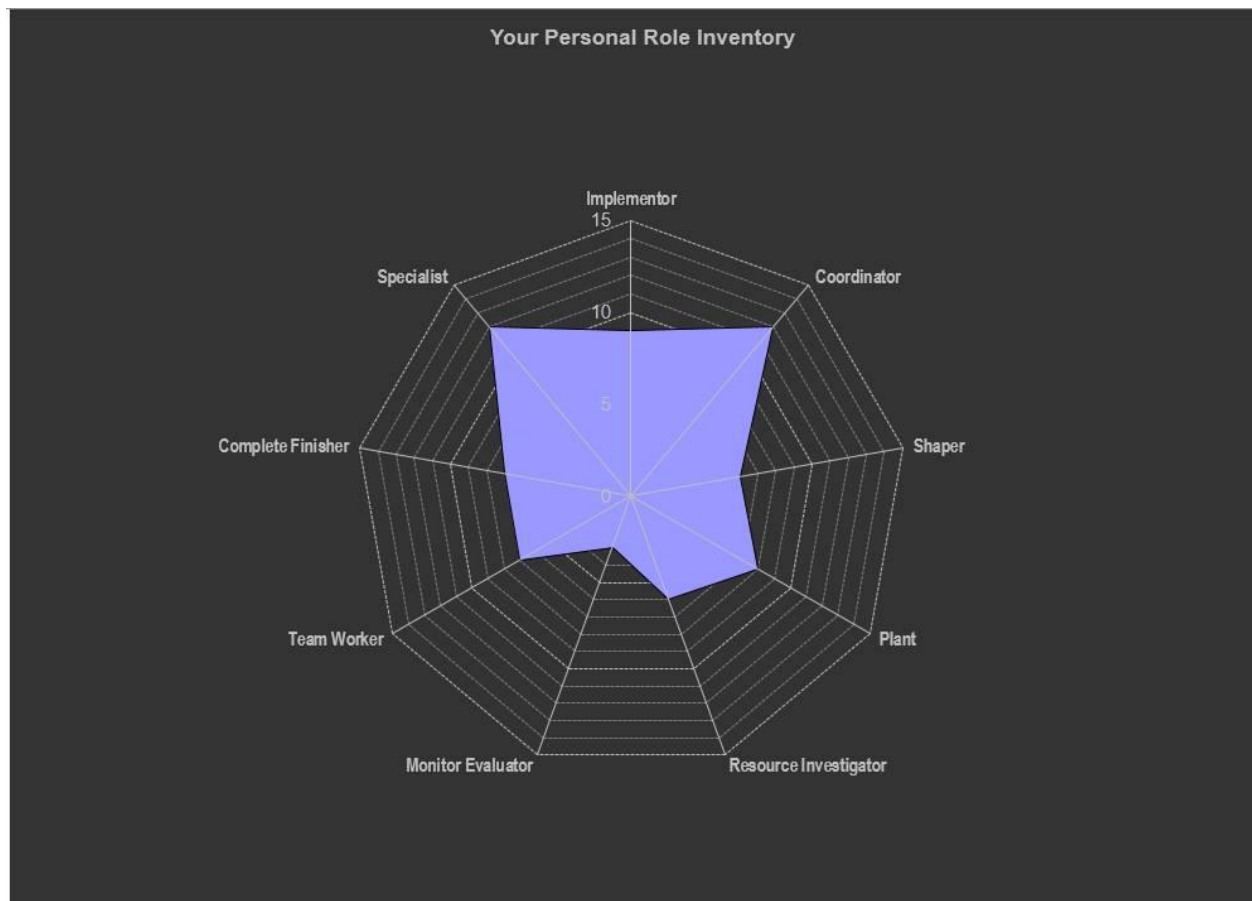
Weaknesses: can be a bit inflexible and slow to respond to new possibilities.

A coordinator is needed to focus on the team's objectives, draw out team members and delegate work appropriately.

Strengths: Mature, confident, identifies talent, and clarifies goals.

Weaknesses: can be seen as manipulative and might offload their own share of the work.

Bianca Sgondea



Section	Total								
I	1	2	1	2	1	1	2	0	0
II	2	2	0	1	1	0	0	2	2
III	2	2	1	0	0	1	1	0	3
IV	0	2	0	0	3	0	0	2	3
V	0	1	2	2	0	1	1	2	1
VI	0	3	0	1	1	0	3	1	1
VII	4	0	2	2	0	0	0	0	2
Total	9	12	6	8	6	3	7	7	12

Roles

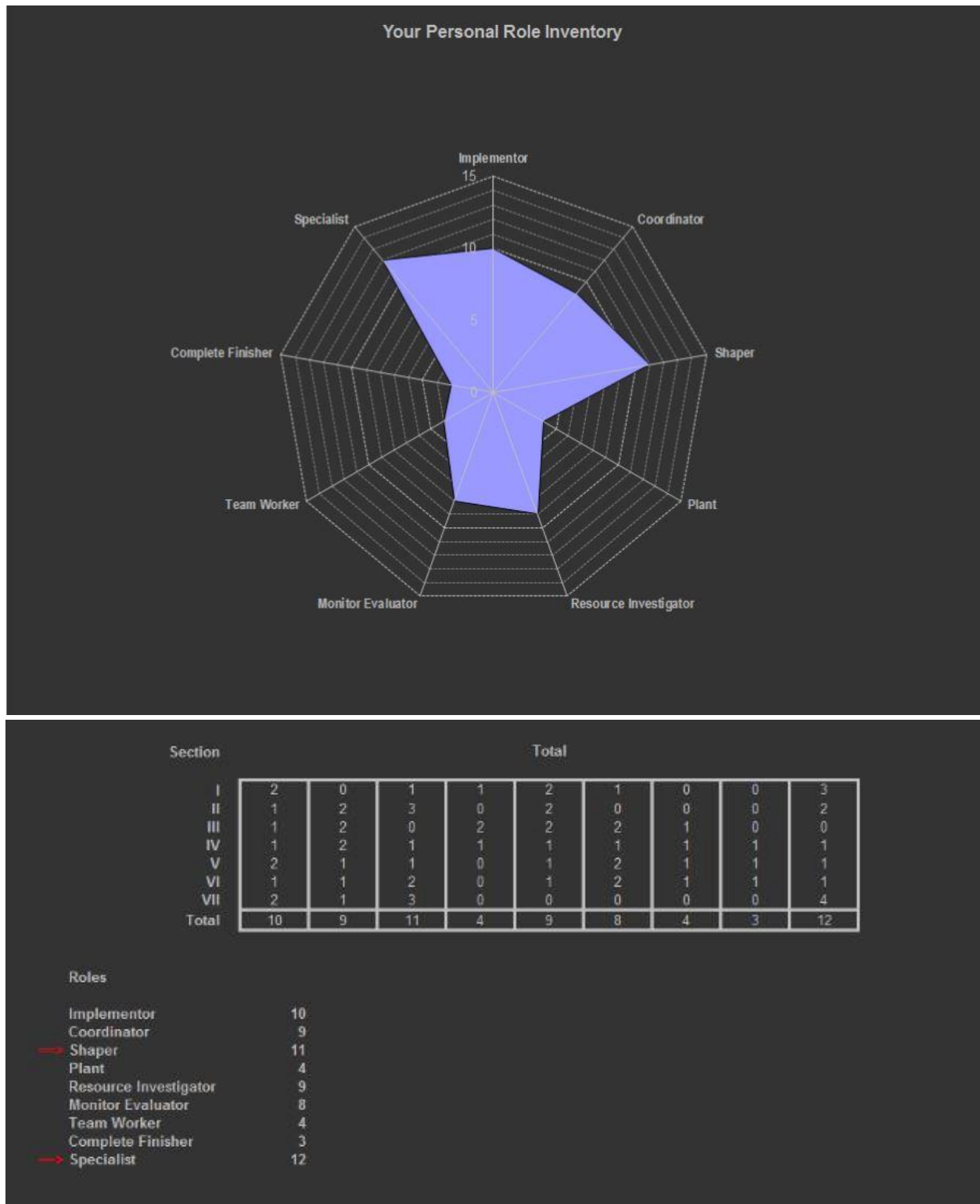
Implementor	9
==> Coordinator	12
Shaper	6
Plant	8
Resource Investigator	6
Monitor Evaluator	3
Team Worker	7
Complete Finisher	7
==> Specialist	12

Bianca's strengths were coordinator and specialist. The explanation for the coordination is the same and can be found under Bashar's chart.

A specialist brings in-depth knowledge of a key area to the team.
Strengths: single-minded, self-starting, and dedicated, provide specialist knowledge and skills.

Weaknesses: tend to contribute on a narrow front and can dwell on the technicalities.

Mihai Cristian Pavel



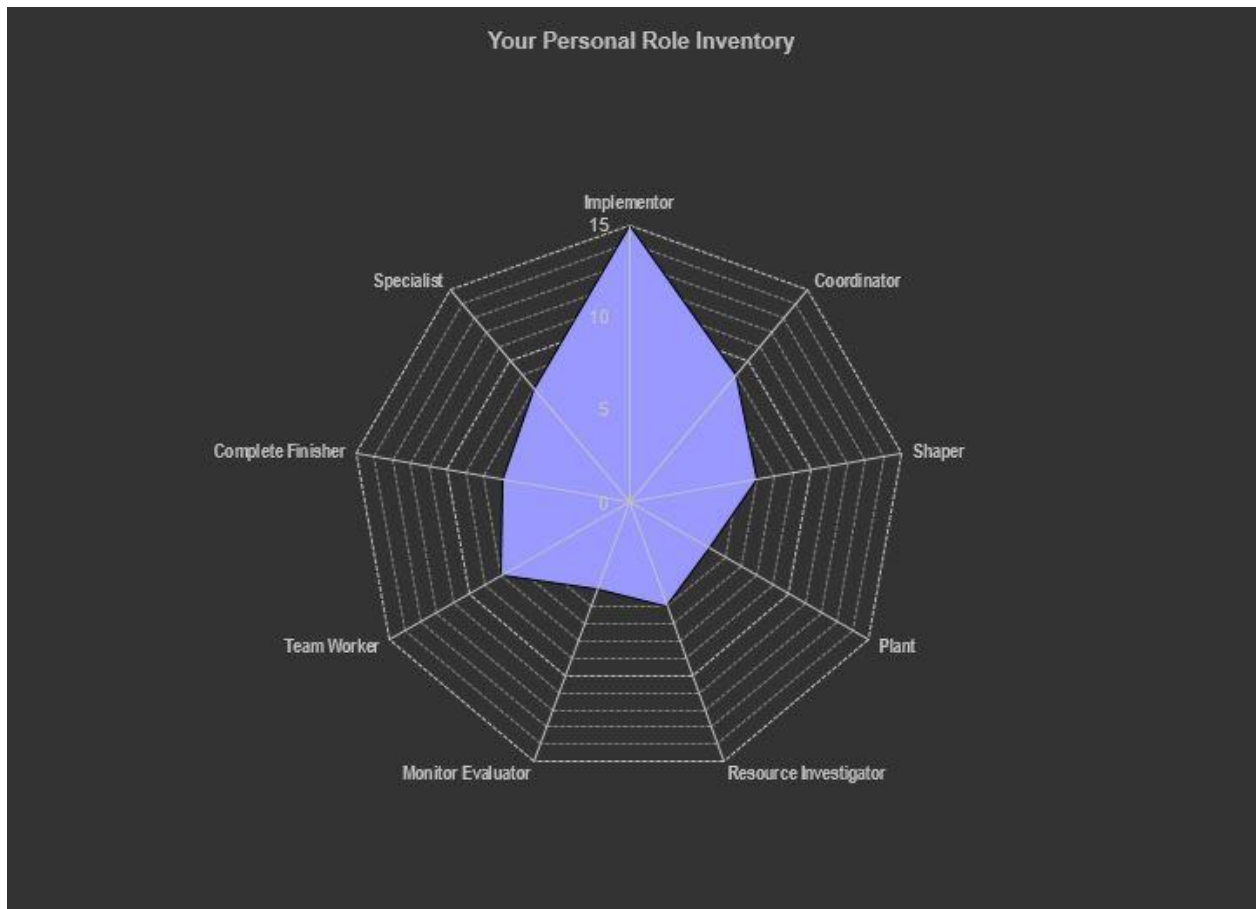
Cristian is a specialist and a shaper, the information about a specialist can be found under Bianca. Shapers provide the necessary drive to ensure that the team keeps moving and does not lost focus

or momentum.

Strengths: challenging, dynamic, thrives on pressure, has the drive and courage to overcome obstacles.

Weaknesses: can be prone to provocation, and may sometimes offend people's feelings.

Tamara Hassan



Section	Total								
I	1	0	2	1	2	2	1	0	1
II	4	2	2	0	0	0	2	0	0
III	2	1	1	1	1	0	1	2	1
IV	2	1	1	1	1	0	1	2	1
V	1	1	0	1	1	2	1	1	2
VI	2	2	1	0	1	1	1	1	1
VII	3	2	0	1	0	0	1	1	2
Total	15	9	7	5	6	5	8	7	8

Roles	
Implementor	15
Coordinator	9
Shaper	7
Plant	5
Resource Investigator	6
Monitor Evaluator	5
Team Worker	8
Complete Finisher	7
Specialist	8

Tamara is exactly like Bashar, therefore the information can be found with Bashar's.

During

SCRUM

SCRUM Team

Product Owner

Bianca Sgondea was our Product Owner for this project. She has done a great job and kept the project under control in terms of functionality. Without her, the team members would not know when to stop as the system can keep growing. Bianca's role was to make sure the team was implementing exactly what she was requiring, not more and not less. After every sprint, it was our Product Owner's job to check out what was implemented during that sprint and how well the team did. If the team did not do a great job as our Product Owner anticipated, the team had to redo the tasks. At the very start of the project period, it is our Product Owner's job to specify exactly what it is she is requiring of the system to do by a certain due date in order for the developers to have an idea of where to begin and how to split their time and tasks.

Scrum Master

Tamara Hassan was our Scrum Master for this project. Our Scrum Master was in charge of ensuring that the team were endorsing the SCRUM framework and values. The Scrum Master had to make sure the team was on the right track and were not distracted while at work. Of course, it was our Scrum Master's job to deal with keeping track of all documentations regarding Scrum.

Team Members

Mihai Cristian Pavel and Bashar Gabbara were part of the Scrum Team and they were in charge of fully understanding the requirements provided by the Product Owner (the product backlog). As Team Members, they had to list the requirements in order of priority and possibly come up with a release backlog which is a specific version of the product backlog. The release backlog includes all the functionalities of the system when it is done and ready to be handed over to the Product Owner. There may be more tasks on the product backlog that the Product Owner didn't necessarily require it and therefore the Team Members may have discarded them due to lack of time or that the Product Owner was satisfied with the system without those specific tasks. A vital communication link exists between the Team Members, the Product Owner and the Scrum Master in order to deliver the product in proper time.

Spring Backlog

Sprint #1: 29/11 – 01/12

Goal: The goal of the first sprint is to focus on creating a working inventory where the administrator may add/delete products, add/delete categories and retrieve information from tables in the database.

User Stories Planned in Sprint #1

User Story ID	Task Number	Tasks	Estimated Story Points	Responsibility
1	1	Create an EER diagram and a conceptual model for Product table, Category table, Pallet table, Supplier table, ProductSuppliers table, and CityPostalCode table.	2	All
1	2	Implement a Product class.	2	Bianca
1	3	Implement a Category class.	2	Bianca
1	4	Implement a Pallet class.	2	Bianca
1	5	Implement a Supplier class.	2	Tamara
1	6	Implement a ProductSuppliers class.	2	Tamara
1	7	Implement a CityPostalCode class.	2	Tamara
1	8	Create a Product table.	2	Bashar
1	9	Create a Category table.	2	Bashar
1	10	Create a Pallet table.	2	Bashar
1	11	Create a Supplier table.	2	Bashar
1	12	Create a ProductSuppliers table.	2	Bashar
1	13	Create a CityPostalCode table.	2	Bashar
1	14	Create a client/server with RMI and Remote Observer.	3	Tamara/Bashar

1	15	Implement the functionality to add a new product to the database.	3	Cristian
1	16	Implement the functionality to delete an existing product from the database.	2	Cristian
1	17	Implement the functionality to add a new category to the database.	2	Cristian
1	18	Implement the functionality to delete an existing category from the database.	1	Cristian
1	19	Implement the functionality that retrieves all the products' information based on the product ID.	3	Cristian/Bashar
1	20	Implement the functionality that allows the user to enter a certain date and retrieves all the products that will expire before that date.	4	Cristian/Bashar
1	21	Implement the functionality that retrieves all the products for a category.	2	Cristian/Bashar
1	22	Create a GUI for the server side.	3	Tamara
1	23	Create a GUI page for adding a new product and category.	5	Bianca
1	24	Create a GUI page for deleting an existing product.	5	Cristian
1	25	Create a GUI page for deleting an existing category.	5	Bashar
1	26	Create a GUI page that allows the user to search for a certain product using the product ID and lists the information about the product (even the ones on different pallets).	5	Tamara
1	27	Create a GUI page allows the user to retrieve the products that have expiration dates before the date inputted by the user.	5	Bianca
1	28	Create a GUI page to print out all the products in the system based on the category chosen.	3	Bashar
1	29	Combine all GUI with functionality.	15	Cristian/Bashar
15	30	Create a use case diagram, and use case descriptions for all the functionalities.	2	Bianca/Tamara
16	31	Create activity diagrams for each use case created.	2	Bianca/Tamara
20	32	Document SCRUM.	2	Tamara
23	33	Document supervisor meeting.	5	Bianca

Sprint #2: 02/12 – 05/12

Goal: The goal for the second sprint is to have the customer be able to make an order, create a login to differentiate between the users and the interfaces, and finally some functionality regarding the pickers.

User Stories Planned in Sprint #2

User Story ID	Task Number	Tasks	Estimated Story Points	Responsibility
4	1	Add Pickers and PickersSchedule table to EER diagram.	2	All
4	2	Implement a Picker class.	1	Bianca
4	3	Implement a PickersSchedule class.	1	Bianca
4	4	Create a Picker table.	1	Tamara
4	5	Create a PickersSchedule table.	1	Tamara
4	6	Create a GUI page to add a picker.	5	Tamara
4	7	Create a GUI page to remove a picker.	5	Cristian
4	8	Create a GUI page to display two lists of pickers (one list with registered pickers at the warehouse, and one list of pickers currently at work).	10	Bianca
4	9	Implement the functionality to add a picker to the system.	3	Cristian
4	10	Implement the functionality to display the two lists of pickers.	15	Cristian/Bashar
4	11	Implement the functionality to remove a picker.	3	Cristian
4	12	Combine the GUI pages with the functionalities.	6	Cristian
14	13	Create a GUI page to allow the user to log in.	5	Bashar
14	14	Implement the functionality to log in as different users.	10	Bashar
14	15	Combine the GUI page with the functionality.	5	Bashar
9	16	Create a GUI page to have the picker check in and check out.	5	Bianca
9	17	Implement the functionality to register when the picker has checked in/checked out.	20	Bashar
12	18	Add Order, Item, and Customer tables to EER diagram.	2	Bashar
12	19	Implement an Order class.	2	Bianca
12	20	Implement an Item class.	2	Bianca

12	21	Implement a Customer class.	2	Bianca
12	22	Create an Order table.	2	Tamara
12	23	Create an Item table.	2	Tamara
12	24	Create a Customer table.	2	Tamara
12	25	Create a GUI page to make an order.	30	All
12,13	26	Implement the functionality to make an order and add to the order table.	20	Bashar/Tamara
3	27	Create a GUI page to show a list of available orders.	5	Bianca/Cristian
3	28	Create a GUI page to show a list of in progress orders.	5	Bianca/Cristian
3	29	Implement the functionality to show the lists.	15	Cristian
3	30	Combine the GUI pages with the functionalities.	9	All
15	31	Create use case descriptions for all the functionalities.	2	Bianca/Tamara
16	32	Create activity diagrams for each use case created.	2	Bianca/Tamara
20	33	Document SCRUM.	2	Tamara

Sprint #3: 06/12 – 08/12

Goal: The goal for the third sprint is to focus on having the picker be able to handle the orders, start them, finish them, and mark them as incomplete. Also tied to the picker finishing an order, our second goal is to be able to generate invoices once the order has been finished by the picker.

User Stories Planned in Sprint #3

User Story ID	Task Number	Tasks	Estimated Story Points	Responsibility
10	1	Create a GUI page to start an order.	15	All
10	2	Implement the functionality to start an order.	15	Bashar/Tamara
10	3	Combine the GUI pages with the functionalities.	30	Bashar
11	4	Create a GUI page to finish an order or make it as incomplete.	20	Bashar
11	5	Implement the functionality to finish an order.	22	Bashar/Tamara
11	6	Implement the functionality to mark an order as incomplete.	30	Bashar
11	7	Combine the GUI pages with the functionalities.	18	Bashar
2	8	Add Invoice table to EER diagram.	2	Cristian

2	9	Implement an Invoice class.	2	Cristian
2	10	Create an Invoice table.	2	Cristian
2	11	Create a GUI page to show a list of invoices.	15	Cristian
2	12	Implement the functionality to show the list of invoices.	8	Cristian
2	13	Combine the GUI pages with the functionalities.	20	Cristian
15	14	Create use case descriptions for all the functionalities.	2	Bianca/Tamara
16	15	Create activity diagrams for all the use case descriptions.	2	Bianca/Tamara
20	16	Document SCRUM.	2	Tamara
23	17	Document interview with Reitan.	5	Bianca

Sprint #4: 09/12 – 11/12

Goal: The goal for the fourth sprint is to try and finish the rest of the functionality of our system so we can have a sprint of just paperwork.

User Stories Planned in Sprint #4

User Story ID	Task Number	Tasks	Estimated Story Points	Responsibility
11	1	Create a GUI page to finish an order or mark it as incomplete.	15	Bashar
11	2	Implement the functionality to finish an order.	15	Bashar/Tamara
11	3	Implement the functionality to mark an order as incomplete.	15	Bashar/Tamara
11	4	Combine the GUI pages with the functionalities.	10	Bashar/Tamara
6	5	Create a GUI page to add a supplier.	5	Cristian
6	6	Implement the functionality to add a supplier.	8	Cristian
6	7	Combine the GUI page with the functionality.	7	Cristian
6	8	Create a GUI page to print a list of all suppliers.	5	Cristian
6	9	Implement the functionality to show the list of suppliers.	8	Cristian
6	10	Combine the GUI page with the functionality.	7	Cristian
7	11	Create a GUI page to add a customer.	5	Bianca
7	12	Implement the functionality to add a customer.	8	Cristian

7	13	Combine the GUI page with the functionality.	7	Cristian
7	14	Create a GUI page to print a list of all customers.	5	Cristian
7	15	Implement the functionality to show the list of customers.	8	Cristian
7	16	Combine the GUI page with the functionality.	7	Cristian
5	17	Create a GUI page to register the goods.	10	Cristian
5	18	Implement the functionality to register the incoming goods.	30	Cristian
5	19	Combine the GUI page with the functionality.	15	Cristian
8	20	Create a GUI page to view the stocks under a certain amount.	5	Cristian
8	21	Implement the functionality to view the stocks under a certain amount.	20	Cristian
8	22	Combine the GUI page with the functionality.	15	Cristian
15	23	Create use case descriptions for all the functionalities.	2	Bianca/Tamara
16	24	Create activity diagrams for all the use case descriptions.	2	Bianca/Tamara
17	25	Create a sequence diagram for one of the use case descriptions.	3	Bianca/Tamara
22	26	Write the abstract for the project.	5	Bianca/Tamara
20	27	Document SCRUM.	2	Tamara

Sprint #5: 12/12 – 14/12

Goal: The goal for the fifth sprint is to document our system in every way we believe is efficient.

User Stories Planned in Sprint #5

User Story ID	Task Number	Tasks	Estimated Story Points	Responsibility
18	1	Document the MVC for our system.	2	Bashar
18	2	Document the Singleton pattern.	2	Bashar
18	3	Document the Remote Observer pattern.	2	Bashar
18	4	Document the Adapter pattern.	2	Bashar
19	5	Document the client/server system using RMI.	5	Bashar
22	6	Create a full class diagram.	3	All
22	7	Create a logical map for the EER diagram.	2	Cristian
22	8	Create a worksheet to be run after running the database to populate it.	2	Bashar

21	9	Document UP.	3	Bianca
22	10	Write introduction for project report.	3	Tamara
22	11	Write non-functional requirements.	5	Tamara
22	12	Write actor descriptions for each actor of the system.	2	Tamara
22	13	Document the GUI design.	10	Bianca
22	14	Document the testing of the system using the product backlog.	5	Tamara
22	15	Document the results of the system.	3	Bianca
22	16	Write the discussion section of the project report.	2	Bianca
22	17	Write a conclusion for the system.	3	Bianca
22	18	Create a User Guide for the system.	5	Cristian
20	19	Document SCRUM.	2	Tamara
23	20	Document the reflection on project work for each group member.	10	All
23	21	Add to the Bloom analysis based on knowledge after the project.	5	All

Appendix D consists of the excel worksheet that includes all the data about the burndown chart and the sprint backlogs.

Sprint Meetings

Sprint Review

Sprint 1: 29/11 – 01/12:

We decided to work on the most important requirement which was managing the products. We broke down that requirement into 33 smaller tasks with 111 estimated story points in total. We wanted to have a working inventory by the end of the first sprint because that is what our entire project is based on. As a group, we successfully accomplished all 111 points. With the completion of the first sprint, our elaboration period was done which deals with creating the core architecture of the system.

Sprint 2: 02/12 – 05/12:

After the first sprint, we had covered the biggest bulk of the system which dealt with managing the products. For the second sprint, we focused on the customer side and managing to have a customer make an order, picker side and having a picker be able to check in and check out, as well as working on managing pickers on the administrator side. We planned 187 estimated story points for the second sprint and managed to successfully accomplish all of them. We broke down the tasks into 33 smaller ones. The plan was to have added more functionality and finish the sprint with a functional system with the added functionality of sprint 2.

Sprint 3: 06/12 – 08/12:

By the third sprint, the customer functionality was done so our focus was on what was left on the administrator side and the picker side. For the third sprint we worked on the functionality for the pickers to be able to start, finish, and mark an order as incomplete. We also worked on generating the invoices and showing the list of invoices on the administrator side. The third sprint contained 17 tasks worth of 203 estimated story points. We were not very successful with implementing the finishing an order and marking it as incomplete so we had to put it back on the release backlog as it was not done. We were 41 points behind after the third sprint but we knew it wouldn't cause us major problems.

Sprint 4: 09/12 – 11/12:

For the fourth sprint, we took the tasks from the release backlog that were related to finishing an order and marking it as incomplete once again as we thought it was important, and since we had started it in the earlier sprint, then we might as well work on it and finish it. We had 27 tasks for the fourth sprint worth of 244 estimated story points. We worked on all the functionality that was remaining of our system and were very successful as we completed all the tasks.

Sprint 5: 12/12 – 14/12:

Entering the fifth sprint, the focus shifted from programming to documentation and that is why all the tasks in the fifth sprint were regarding documentation. We had 21 tasks worth of 78 estimated story points and we thankfully completed all the tasks.

Sprint Retrospective

Sprint 1: 29/11 – 01/12:

We worked well together, we split the work in terms of tasks from the sprint backlog and once it came to combining code, we worked in pairs where 2 were working on combining the GUI created with the functionality and the other 2 were working on documentation. This plan worked for us as we accomplished all the tasks for the first sprint successfully.

Sprint 2: 02/12 – 05/12:

For the second sprint, we changed the way we work slightly. Instead of waiting until the end to combine all the GUI pages with the functionality, we would working on combining right after both were done. We would not move forward to another task (for that one or two people) until the page was fully functional. At the very end we would all combine our code which would be

commented so we know what the new code that needs to be added is, which made it easy to combine everything. Also, it is evident that this sprint was 4 days and not 3 as what it should be, that is because we decided to take Sunday off; this means that our sprint was 4 days but it was still 3 days worth of work.

Sprint 3: 06/12 – 08/12/16:

During the third sprint, we made it clear from the start who would work on which tasks so there is no confusion. We worked the same way we worked during the second sprint in terms of making a page fully functional before moving on. With this technique, we realized that we have a fully functioning system at the end of each sprint and with every sprint comes more functionality of our system. We did not accomplish everything that we wanted to but we knew we would still be alright since the workload that we managed to achieve in the first two sprints was more difficult and time consuming than the workload we had left. This sprint also included an interview with a team leader at Reitan which was very helpful and helped us realize that with our plan, we covered the main functionality any warehouse would need.

Sprint 4: 09/12 – 11/12

For the fourth sprint, we managed to work together in order to make sure we would be done with programming our system. We managed to combine all the code from this sprint in 20 minutes or so because we made sure we commented on the changes we made for each class with the date of when the changes were made.

Sprint 5: 12/12 – 14/12

For the fifth sprint, we worked from home one day of the three day sprint just because we agreed it would be better to work on paper work individually and share everything we did the next day. We came to the realization that working on paperwork is different than programming and it is best done when you are in your own bubble. It worked in our favour as we were successful for the fifth sprint and we were very happy with our working system.

Sprint Planning

During the Inception phase of Unified Process, we discussed the sprint length, how we should work together in order to tackle the problem, and where to begin.

To decide on the sprint length, we looked at the calendar and our estimation of the stages of the UP (Unified Process). We had 15 days planned for Elaboration and Construction so we decided to have 5 sprints of 3 days each. We originally had 3 days planned for the Transition phase

but as mentioned, all the dates for the stages were estimates, we prolonged the sprinting by one day and therefore our transition phase became 2 days rather than 3.

We planned each sprint at a time (planned the next sprint at the end of the previous one). We decided to work in a way that at the end of each sprint we should have a fully functional system that can be delivered to the Product Owner if necessary.

For the first sprint, we decided to focus on managing the products on the administrator side because that contained the biggest bulk of the system. For the second sprint, we planned to focus on the customer making an order, having the pickers check in and out of work, and managing the pickers on the administrator side. For the third sprint, we focused on the rest of the functionality on the picker side as well as generating and viewing the list of invoices. For the fourth sprint, we continued working on the picker making sure they can finish an order and marking an order as incomplete, along with the functionality that we had left. For the fifth sprint, we decided that the system we have was what the Product Owner wanted, so we focused more on the documentation work.

Daily Meetings

29/11/2016

- Today: We are going to begin working on creating an EER diagram with all the tables that are relevant to the tasks we included for this sprint. We will work on creating the classes in Java and their corresponding tables in SQL. We hope to be able to also setup the client/server connection. We also plan to work on the functionalities and if we have time, maybe begin working on the GUI pages that are relevant.

30/11/2016

- Yesterday: We managed to accomplish everything we had in mind and began working on the GUI pages.
- Problems: We weren't sure of where exactly to place the action listeners whether it is in the view or the controller but we are meeting with Troels today to ask him.
- Today: We plan to continue creating the Java classes necessary and a few more tables in the database that we need. We plan to continue working on the GUI pages, and if completed, then begin combining all the GUI pages with the functionality we have.

01/12/2016

- Yesterday: We worked on finishing up the GUI pages for the manage products and started working on joining the GUI with the functionality.

- Problems: It was quite difficult to combine all the GUI with the functionality as we had a big bulk of code to go through in order to add the action listeners.
- Today: We are going to continue working on combining the GUI pages with the functionality and work on the use cases and use case diagram.

02/12/2016

- Yesterday: We worked on finishing up the first sprint which we successfully and managed to combine all the GUI pages with the functionality. We had a working system at the end of sprint one.
- Problems: It took a while to create all the action listeners but it was manageable.
- Today: We decided to work differently from now on, rather than wait until the end to combine all the GUI pages with the functionality, we decided to work on a GUI page, create the functionality behind it, and combine them before moving on to another task. We planned to add more tables to the EER diagram, create the Java classes and the tables in SQL, and begin working on GUI pages and some functionality.

03/12/2016

- Yesterday: We managed to finish the few Java classes as well as create the tables for the first task and began on some GUI pages.
- Problems: It was quite difficult to create the GUI page for making an order as was quite complex.
- Today: We plan to continue on creating GUI pages, continue working on some functionality, and combine the GUI pages with the functionality we already have by now.

05/12/2016

- Yesterday: We decided to take this Sunday (04/12) off so we are continuing our second sprint today as well.
- Problems: Realized we were pressed by time as we still had a lot of story points to cover for the last day of our second sprint.
- Today: We plan to work as hard as possible to finish the last few GUI pages and their corresponding functionalities and combine everything so we can once again have a fully functional system by the end of today.

06/12//2016

- Yesterday: We successfully managed to complete all the tasks for the second sprint.

- Problems: It was definitely a challenge to finish up the functionality for making an order and combining it with the GUI.
- Today: We plan to start creating a few GUI pages along with modifying our EER diagram and creating a Java class and an SQL table.

07/12/2016

- Yesterday: We managed to finish a few tasks but not everything that we had started.
- Problems: The GUI page to start an order was not as easy as we thought it would be and was more time consuming than we had planned for it.
- Today: We plan to continue working on the GUI pages that we began the day before, and also begin working on implementation of the functionalities.

08/12/2016

- Yesterday: We began working on some functionality and tried to combine what we had by the end of the day.
- Problems: We still have a lot to implement for finish an order and marking it as incomplete but we hope we are capable of finishing it by the end of today; otherwise it would have to be put back on the release backlog.
- Today: We are going to try to continue implementing the rest of the functionality for this sprint but it seems like we have plenty of work to do.

09/12/2016

- Yesterday: We did not manage to accomplish all the tasks of the third sprint therefore some of the tasks went back to the release backlog and were added again for the fourth sprint.
- Problems: Implementing the functionality for finishing and the incompleteness of an order was not as smooth as we thought it would be.
- Today: We plan to continue working on the functionality and GUI pages for the picker side so we can be done with that once and for all. We also plan to begin working on new GUI pages along with their functionality.

10/12/2016

- Yesterday: We managed to meet our goals successfully and finished what we started for the first day of the sprint.
- Problems: We had to spend all day on implementing the last few things on the picker side which was not very pleasant but it was definitely an accomplishment.
- Today: We plan to work on the abstract for the project and also the functionality to register

goods into the inventory.

11/12/2016

- Yesterday: We successfully completed the tasks we had for the day.
- Problems: It was a Saturday and most of us did not do much except for completing two tasks which meant we had a lot of work to do for the last day of the sprint.
- Today: We hope to be able to finish the rest of the tasks that are not yet done for this sprint.

12/12/2016

- Yesterday: We worked extremely hard all day to manage to finish all the tasks we had and we successfully did so.
- Problems: It was a long day of work but a successful one.
- Today: We plan to begin the documentation of the system and finish as much as possible.

13/12/2016

- Yesterday: We managed to finish some of the project report and put together almost half of the process report.
- Problems: It was difficult to begin combining all the paperwork and make sure everything was correct but always manageable.
- Today: We plan to begin documenting the design patterns we used, and continue working on the project report, hopefully finishing it if possible.

14/12/2016

- Yesterday: We managed to finish what we began but still had a lot to do by the end of the last day of the fifth sprint.
- Problems: Some decisions were difficult to take such as who did which part of the documentation and what was left, and what should we work on next.
- Today: We plan to complete all the paperwork and documentation of our system.

Burndown Chart

We used an excel sheet to document all information about our individual sprints and our burndown for the entire project. Excel organizes the data and makes it easy to read. We documented our sprint backlogs also through excel, we have a table of data for each sprint along with a chart. The burndown chart for the entire sprinting period can be found later in this document along with an explanation of how it works.

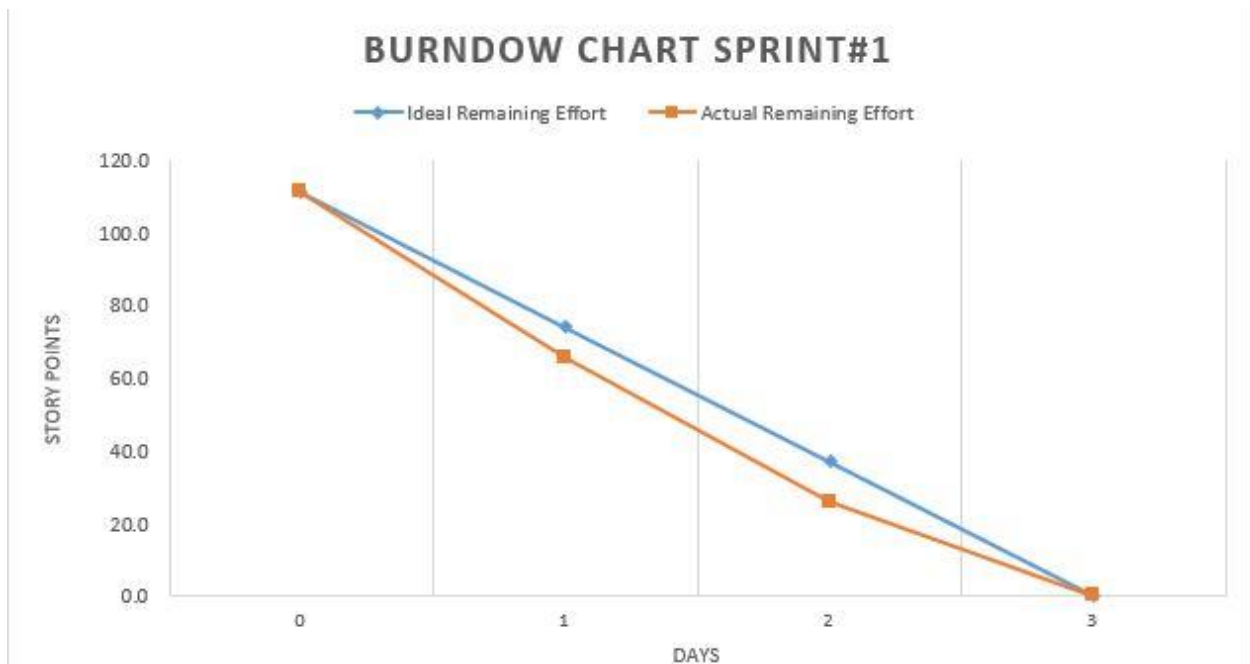
The tables for each sprint include the User Story ID which is taken from the release backlog based on the task that is to be done, the Task Number, the Tasks, and an Estimate of Story Points.

Each sprint consisted of three days and therefore in the tables there is day 1, day 2, and day 3 to show which tasks were worked on which day(s). For the individual sprints, zeroes mean that it was not worked on, partial numbers that do not much the estimated story points indicate that the task was begun and not finished, and if the total work done column is equal to the estimated story points column, then the task was completed and can be burned down as full points from our burndown chart. Some of the User Story IDs are repeated multiple times and that is because we broke down the task from the release backlog into many smaller tasks that we can work with. Also in the table, we have a responsible column which indicates which group member worked on which task; and that is included for every sprint.

We have a chart for each sprint which includes two lines, an ideal remaining effort and an actual remaining effort. The ideal remaining effort is a calculated line based on the total points for that sprint being broken down equally for each day of the sprint. If we were to work perfectly, then we should be following exactly that line. Unfortunately, that is not how it works always, hence the actual remaining effort line. That line is calculated based on how much we actually worked each day of the sprint. Both lines are in different colours so it is clearly visible how our project work went versus how it would look if we worked perfectly. Both lines help us have an overall image of whether or not we are on track, far behind, or far ahead.

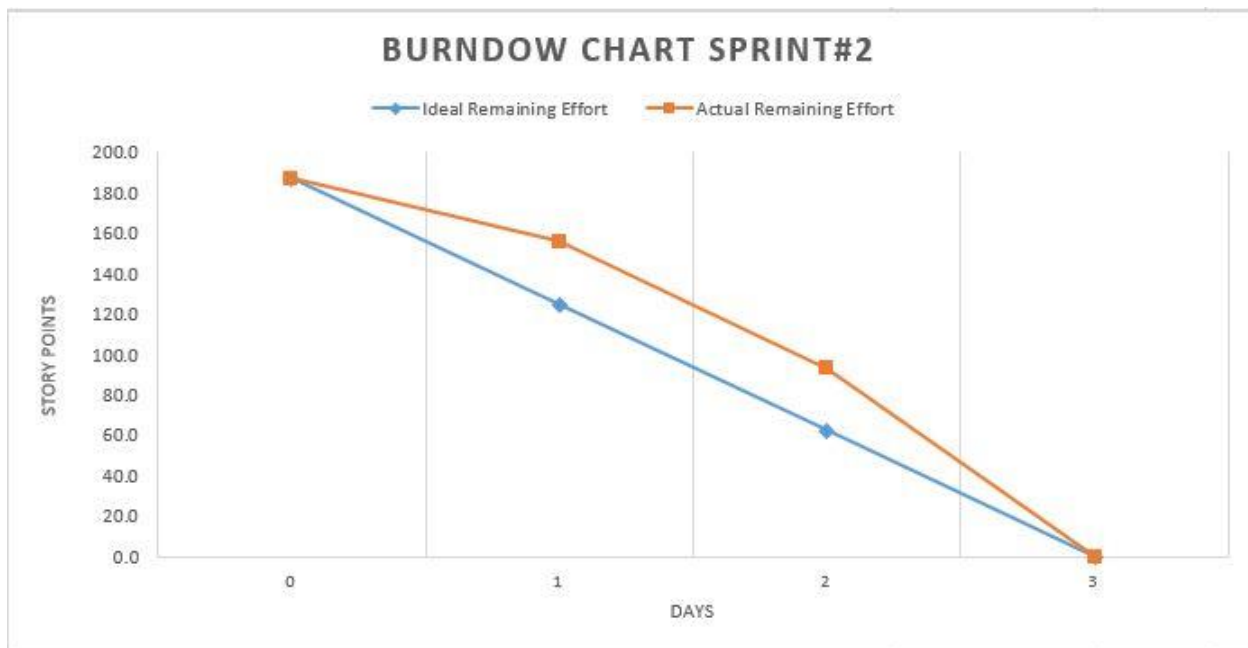
Sprint #1: 29/11 – 01/12

User Story Id	Task Number	Tasks	Estimate Story Points	Day 1 - 29/11	Day 2 - 30/11	Day 3 - 01/12	Total work done	Responsible
1	1	Create an EER diagram and a conceptual model for Product table, Category table, Pallet table, Supplier table, ProductSuppliers table, and CityPostalCode table.	2	2	0	0	2	All
1	2	Implement a Product class.	2	2	0	0	2	Bianca
1	3	Implement a Category class.	2	2	0	0	2	Bianca
1	4	Implement a Pallet class.	2	2	0	0	2	Bianca
1	5	Implement a Supplier class.	2	0	2	0	2	Tamara
1	6	Implement a ProductSuppliers class.	2	0	2	0	2	Tamara
1	7	Implement a CityPostalCode class.	2	0	2	0	2	Tamara
1	8	Create a Product table.	2	2	0	0	2	Bashar
1	9	Create a Category table.	2	2	0	0	2	Bashar
1	10	Create a Pallet table.	2	2	0	0	2	Bashar
1	11	Create a Supplier table.	2	0	2	0	2	Bashar
1	12	Create a ProductSuppliers table.	2	0	2	0	2	Bashar
1	13	Create a CityPostalCode table.	2	0	2	0	2	Bashar
1	14	Create a client/server with RMI and Remote Observer.	3	2	0	1	3	Tamara/Bashar
1	15	Implement the functionality to add a new product to the database.	3	3	0	0	3	Cristi
1	16	Implement the functionality to delete an existing product from the database.	2	2	0	0	2	Cristi
1	17	Implement the functionality to add a new category to the database.	2	2	0	0	2	Cristi
1	18	Implement the functionality to delete an existing category from the database.	1	1	0	0	1	Cristi
1	19	Implement the functionality that retrieves all the products' information based on the product ID.	3	3	0	0	3	Cristi/Bashar
1	20	Implement the functionality that allows the user to enter a certain date and retrieves all the products that will expire before that date.	7	7	0	0	7	Cristi/Bashar
1	21	Implement the functionality that retrieves all the products for a category.	2	0	0	2	2	Bashar/Cristi
1	22	Create a GUI for the server side.	3	3	0	0	3	Tamara
1	23	Create a GUI page for adding a new product and category.	5	1	4	0	5	Bianca
1	24	Create a GUI page for deleting an existing product.	5	0	5	0	5	Cristi
1	25	Create a GUI page for deleting an existing category.	5	2	3	0	5	Bashar
1	26	Create a GUI page that allows the user to search for a certain product using the product ID and lists the information about the product (even the ones on different categories).	5	2	3	0	5	Tamara
1	27	Create a GUI page that allows the user to retrieve the products that have expiration dates before the date inputted by the user.	5	3	2	0	5	Bianca
1	28	Create a GUI page to print out all the products in the system based on the category.	3	0	0	3	3	Bashar
1	29	Combine all GUI with functionality.	20	0	5	15	20	Cristi/Bashar
15	30	Create a use case diagram, and use case descriptions for all the functionalities.	2	0	0	2	2	Bianca/Tamara
16	31	Create activity diagrams for each use case created.	2	0	0	2	2	Bianca/Tamara
20	32	Document SCRUM.	2	0.5	0.5	1	2	Tamara
23	33	Document supervisor meeting.	5	0	5	0	5	Bianca
Work Days			0	1	2	3		
Ideal Remaining Effort			111.0	74.0	37.0	0		
Actual Remaining Effort			111.0	65.5	26.0	0.0		



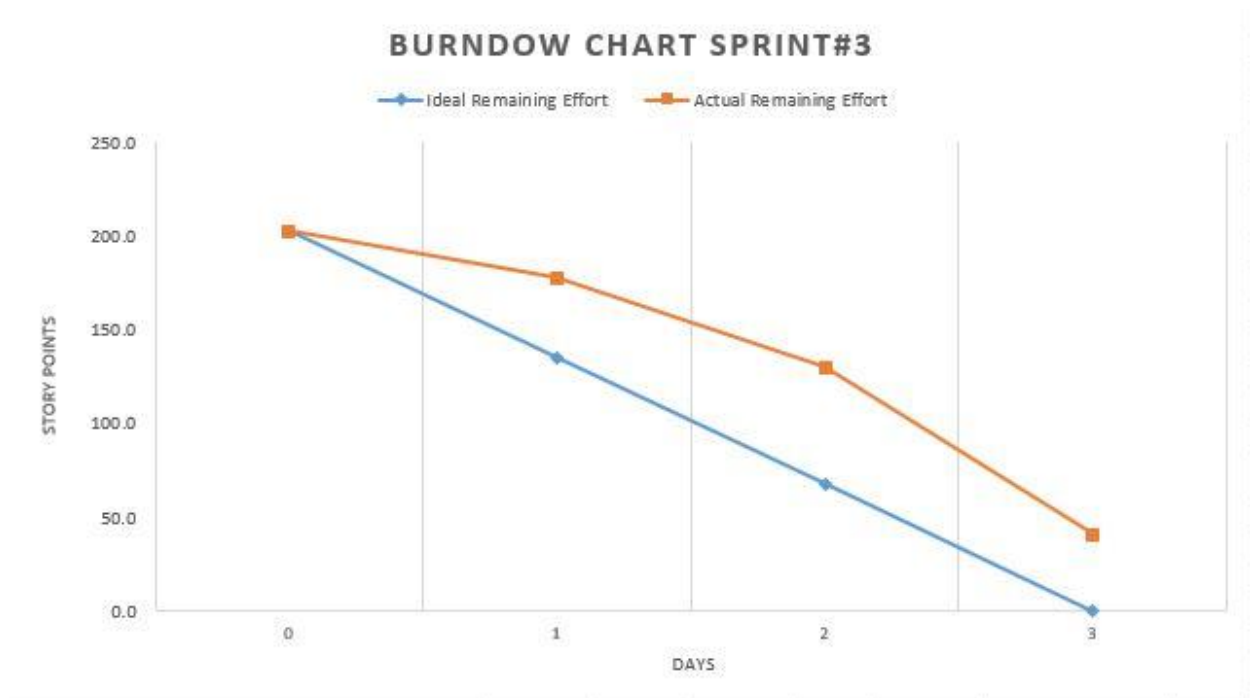
Sprint #2: 02/12 – 05/12

User Story Id	Task Number	Tasks	Estimate Story Points	Day 1 - 02/12	Day 2 - 04/12	Day 3 - 05/12	Total work done	Responsibility
4	1	Add Pickers and PickersSchedule table to EER diagram.	2	2	0	0	2	All
4	2	Implement a Picker class.	1	1	0	0	1	Bianca
4	3	Implement a PickersSchedule class.	1	1	0	0	1	Bianca
4	4	Create a Picker table.	1	1	0	0	1	Tamara
4	5	Create a PickersSchedule table.	1	1	0	0	1	Tamara
4	6	Create a GUI page to add a picker.	5	5	0	0	5	Tamara
4	7	Create a GUI page to remove a picker.	5	0	5	0	5	Cristi
4	8	Create a GUI page to display two lists of pickers (one list with registered pickers at the warehouse, and one list of pickers currently at work).	10	0	5	5	10	Bianca
4	9	Implement the functionality to add a picker to the system.	3	0	0	3	3	Cristi
4	10	Implement the functionality to display the two lists of pickers.	15	0	0	15	15	Crist/Bashar
4	11	Implement the functionality to remove a picker.	3	0	0	3	3	Cristi
4	12	Combine the GUI pages with the functionalities.	6	0	0	6	6	Cristi
14	13	Create a GUI page to allow the user to log in.	5	0	5	0	5	Bashar
14	14	Implement the functionality to log in as different users.	10	0	8	2	10	Bashar
14	15	Combine the GUI page with the functionality.	5	0	5	0	5	Bashar
9	16	Create a GUI page to have the picker check in and check out.	5	0	5	0	5	Bianca
9	17	Implement the functionality to register when the picker has checked in/checked out.	20	0	20	0	20	Bashar
12	18	Add Order, Item, and Customer tables to EER diagram.	2	0	0	2	2	Bashar
12	19	Implement an Order class.	2	0	0	2	2	Bianca
12	20	Implement an Item class.	2	0	0	2	2	Bianca
12	21	Implement a Customer class.	2	0	0	2	2	Bianca
12	22	Create an Order table.	2	0	0	2	2	Tamara
12	23	Create an Item table.	2	0	0	2	2	Tamara
12	24	Create a Customer table.	2	0	0	2	2	Tamara
12	25	Create a GUI page to make an order.	30	10	10	10	30	All
12+13	26	Implement the functionality to make an order and add to the order table.	20	0	0	20	20	Bashar/Tamara
3	27	Create a GUI page to show a list of available orders.	5	5	0	0	5	Bianca/Cristi
3	28	Create a GUI page to show a list of in progress orders.	5	5	0	0	5	Bianca/Cristi
3	29	Implement the functionality to show the lists.	15	0	0	15	15	Cristi
3	30	Combine the GUI pages with the functionalities.	9	0	3	6	9	All
15	31	Create use case descriptions for all the functionalities.	2	0	2	0	2	Bianca/Tamara
16	32	Create activity diagrams for all the use case descriptions.	2	0	2	0	2	Bianca/Tamara
20	33	Document SCRUM	2	0.5	0.5	1	2	Tamara
Work Days			0	1	2	3		
Ideal Remaining Effort			187.0	124.7	62.3	0.0		
Actual Remaining Effort			187.0	156.0	93.0	0.0		



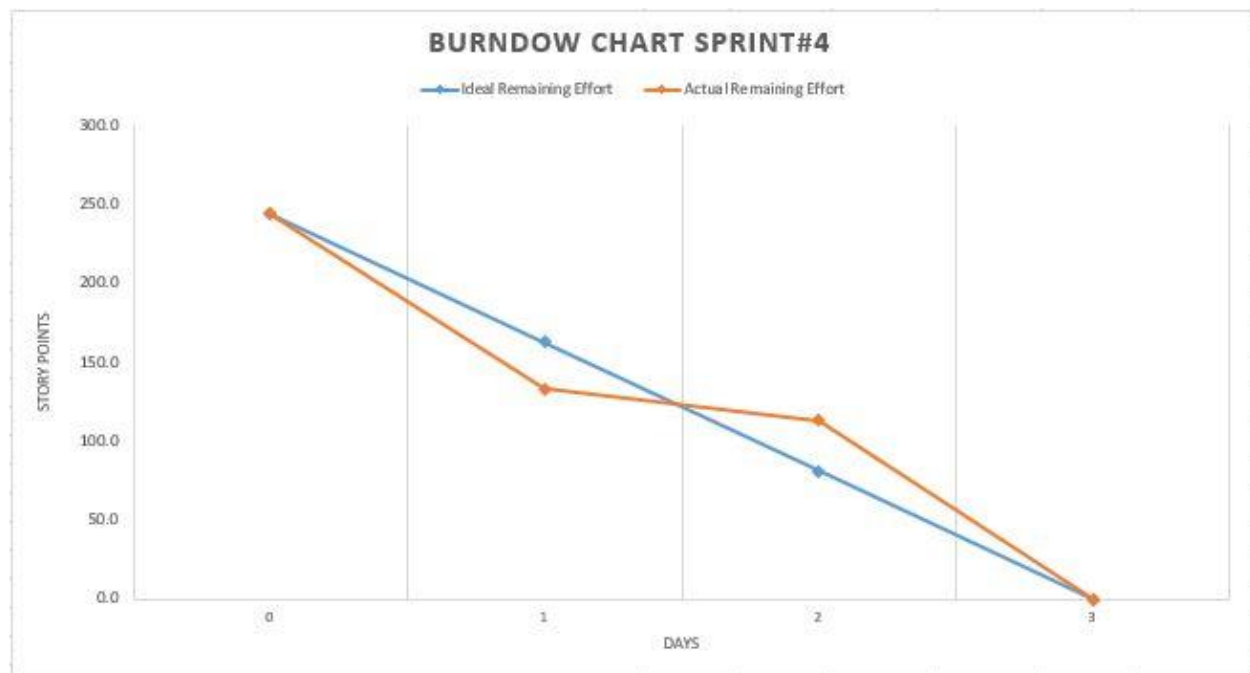
Sprint #3: 06/12 – 08/12

Tasks	Estimate				Total	Responsibility
	Story Points	Day 1 - 06/12	Day 2 - 07/12	Day 3 - work 08/12 done		
Create a GUI page to start an order.	15	10	3	2	15	All
Implement the functionality to start an order.	15	0	10	5	15	Bashar/Tamara
Combine the GUI pages with the functionalities.	30	0	10	14	24	Bashar
Create a GUI page to finish an order or mark it as incomplete.	20	0	0	15	15	Bashar
Implement the functionality to finish an order.	22	0	0	15	15	Bashar/Tamara
Implement the functionality to mark an order as incomplete.	30	0	0	15	15	Bashar
Combine the GUI pages with the functionalities.	18	0	0	10	10	Bashar
Add Invoice table to EER diagram.	2	2	0	0	2	Cristi
Implement an Invoice class.	2	2	0	0	2	Cristi
Create an Invoice table.	2	2	0	0	2	Cristi
Create a GUI page to show a list of invoices.	15	7	8	0	15	Cristi
Implement the functionality to show the list of invoices.	8	2	2	4	8	Cristi
Combine the GUI pages with the functionalities.	20	0	15	5	20	Cristi
Create use case descriptions for all the functionalities.	2	0	0	2	2	Bianca/Tamara
Create activity diagrams for all the use case descriptions.	2	0	0	2	2	Bianca/Tamara
Document SCRUM.	2	0.5	0.5	1	2	Tamara
Document interview with Reitan.	5	5	0	0	5	Bianca
Work Days	0	1	2	3		
Ideal Remaining Effort	203.0	135.3	67.7	0.0		
Actual Remaining Effort	203.0	178.0	130.0	41.0		



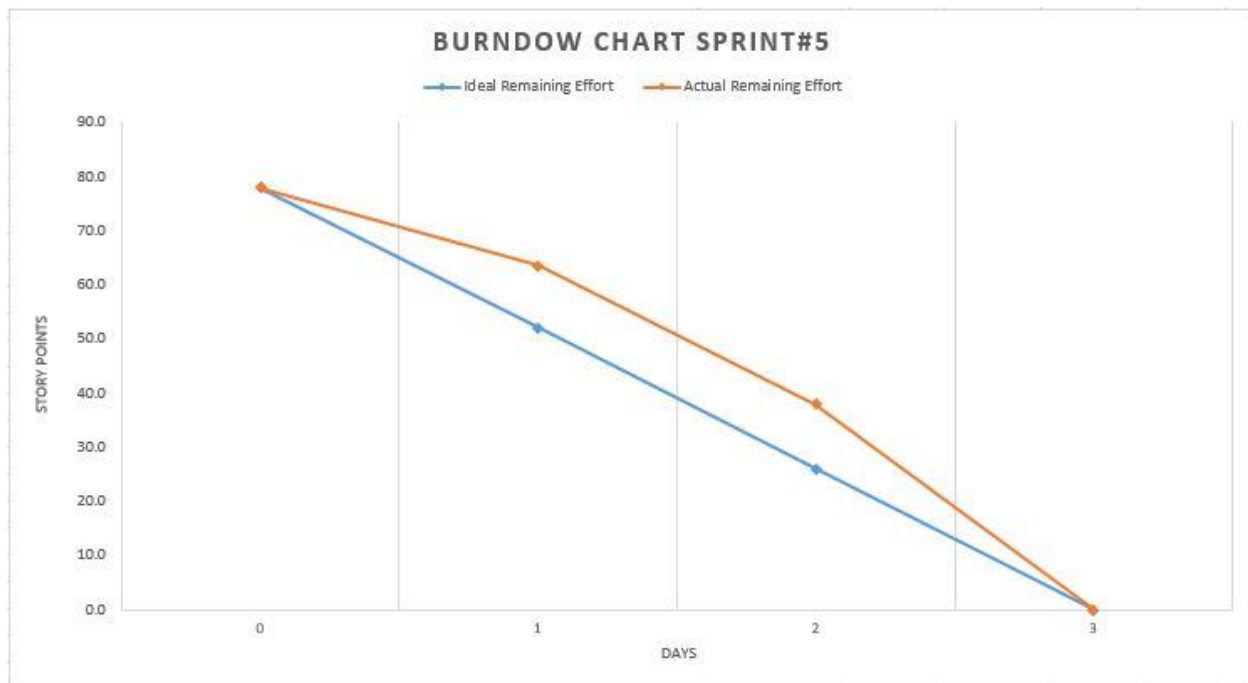
Sprint #4: 09/12 – 11/12

User	Task	Estimate	Story Points	Day 1 - 09/12	Day 2 - 10/12	Day 3 - 11/12	Total work done	Responsibility
11	1 Create a GUI page to finish an order or mark it as incomplete.	15	15	0	0	0	15	Bashar
11	2 Implement the functionality to finish an order.	15	15	0	0	0	15	Bashar/Tamara
11	3 Implement the functionality to mark an order as incomplete.	15	15	0	0	0	15	Bashar/Tamara
11	4 Combine the GUI pages with the functionalities.	10	10	0	0	0	10	Bashar/Tamara
6	5 Create a GUI page to add a supplier.	5	5	0	0	0	5	Cristi
6	6 Implement the functionality to add a supplier	8	8	0	0	0	8	Cristi
6	7 Combine the GUI page with the functionality.	7	7	0	0	0	7	Cristi
6	8 Create a GUI page to print a list of all suppliers.	5	5	0	0	0	5	Cristi
6	9 Implement the functionality to show the list of suppliers.	8	8	0	0	0	8	Cristi
6	10 Combine the GUI page with the functionality.	7	7	0	0	0	7	Cristi
7	11 Create a GUI page to add a customer.	5	5	0	0	0	5	Bianca
7	12 Implement the functionality to add a customer.	8	0	0	8	0	8	Cristi
7	13 Combine the GUI page with the functionality.	7	0	0	7	0	7	Cristi
7	14 Create a GUI page to print a list of all customers.	5	0	0	5	0	5	Cristi
7	15 Implement the functionality to show the list of customers.	8	0	0	8	0	8	Cristi
7	16 Combine the GUI page with the functionality.	7	0	0	7	0	7	Cristi
5	17 Create a GUI page to register the goods.	10	10	0	0	0	10	Cristi
5	18 Implement the functionality to register the incoming goods.	30	0	15	15	0	30	Cristi
5	19 Combine the GUI page with the functionality.	15	0	0	15	0	15	Cristi
8	20 Create a GUI page to view the stocks under a certain amount.	5	0	0	5	0	5	Cristi
8	21 Implement the functionality to view the stocks under a certain amount.	20	0	0	20	0	20	Cristi
8	22 Combine the GUI page with the functionality.	15	0	0	15	0	15	Cristi
15	23 Create use case descriptions for all the functionalities.	2	0	0	2	0	2	Bianca/Tamara
16	24 Create activity diagrams for all the use case descriptions.	2	0	0	2	0	2	Bianca/Tamara
17	25 Create a sequence diagram for one of the use case descriptions.	3	0	0	3	0	3	Bianca/Tamara
22	26 Write the abstract for the project.	5	0	5	0	0	5	Bianca/Tamara
20	27 Document SCRUM.	2	0.5	0.5	1	0	2	Tamara
Work Days			0	1	2	3		
Ideal Remaining Effort			244.0	162.7	81.3	0.0		
Actual Remaining Effort			244.0	133.5	113.0	0.0		



Sprint #5: 12/12 – 14/12

User	Task	Estimate	Day 1 –	Day 2 –	Day 3 –	Total	
Story Id	Number	Story Points	09/12	10/12	11/12	work done	Responsibility
18	1	2	0	2	0	2	Bashar
18	2	2	0	2	0	2	Bashar
18	3	2	0	0	2	2	Bashar
18	4	2	0	0	2	2	Bashar
19	5	5	0	0	5	5	Bashar
22	6	3	0	0	3	3	All
22	7	2	0	0	2	2	Cristian
22	8	2	0	0	2	2	Bashar
21	9	3	1	2	0	3	Bianca
22	10	3	3	0	0	3	Tamara
22	11	5	5	0	0	5	Tamara
22	12	2	0	2	0	2	Tamara
22	13	10	0	0	10	10	Bianca
22	14	5	5	0	0	5	Tamara
22	15	3	0	3	0	3	Bianca
22	16	2	0	2	0	2	Bianca
22	17	3	0	3	0	3	Bianca
22	18	5	0	2	3	5	Cristian
20	19	2	0.5	0.5	1	2	Tamara
23	20	10	0	2	8	10	All
23	21	5	0	5	0	5	All
Work Days		0	1	2	3		
Ideal Remaining Effort		78.0	52.0	26.0	0.0		
Actual Remaining Effort		78.0	63.5	38.0	0.0		



Burndown Chart

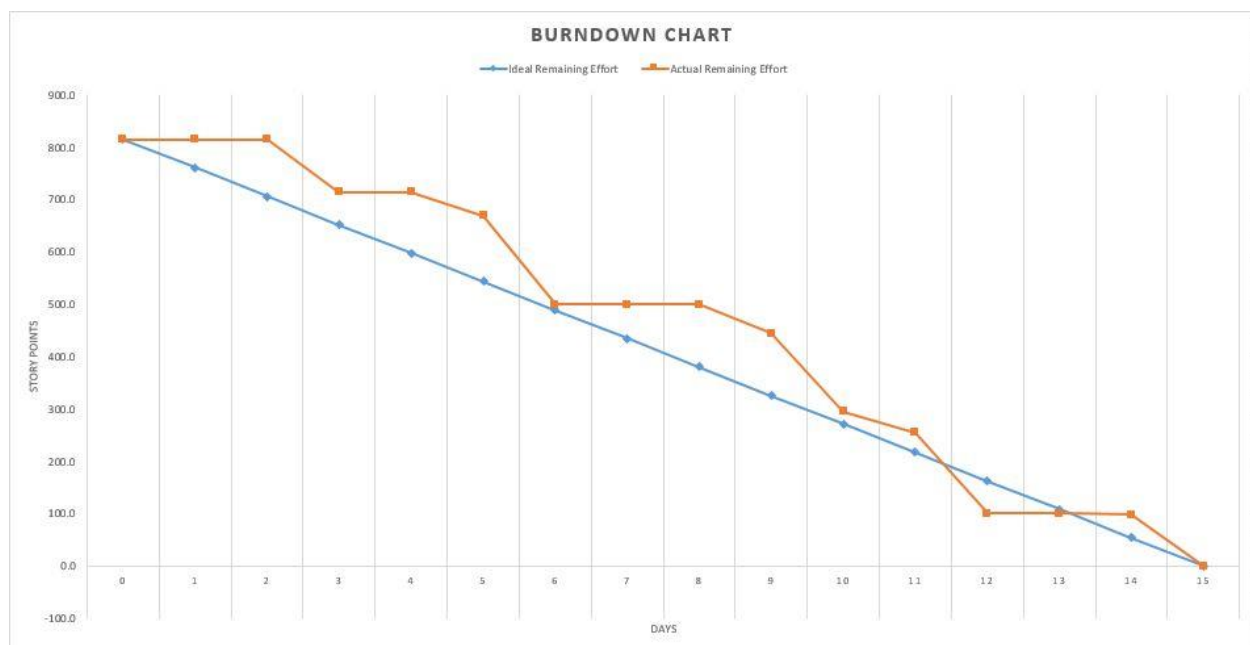
The burndown chart as mentioned before, was created and documented using an excel sheet. We had calculations to keep track of all the estimated story points, whether the tasks were successfully accomplished, and how well we were working at any point in time. The figure below is how our first sheet looks and it is of the release backlog. This table includes the User Story IDs, the tasks from the release backlog, the total estimated story points for each task (they are broken down further as the tasks itself is broken down in the sprints), and an overview of each day of the

sprinting period. What is different in this table than the tables of the sprints above is that zeroes here mark that the work is done, otherwise the work is not done. There are no partial numbers here, if the task was not finished in the sprint, it comes back to the release backlog with full points, regardless of whether the task is halfway done or not. The chart can be found below and as visible, it also includes the two lines that are also included in every sprint's documentation. The calculations of those lines are done in the exact same manner and are used for the same reasons. As a group, looking at the chart helps us understand whether we are behind, on track, or ahead of what we planned. It tells us whether we need to work harder and speed up or continue at the pace we are currently at. The documentation of the sprints and the burndown chart has been extremely helpful with the organization of the project work.

User Story ID	Release Backlog	Estimated Story Points	Sprint #1 Day 1 - 29/11	Day 2 - 30/11	Day 3 - 01/12	Sprint #2 Day 4 - 02/12	Day 5 - 04/12	Day 6 - 05/12	Sprint #3 Day 7 - 06/12	Day 8 - 07/12	Day 9 - 08/12
1	As a user logged in as an admin, I want to be able to manage products.	100	100	100	0	0	0	0	0	0	0
2	As a user logged in as an admin, I want to have access to an invoice history.	55	55	55	55	55	55	55	55	55	0
3	As a user logged in as an admin, I want to be able to check the orders.	40	40	40	40	40	40	0	0	0	0
4	As a user logged in as an admin, I want to be able to manage pickers.	60	60	60	60	60	60	0	0	0	0
5	As a user logged in as an admin, I want to be able to register merchandise received by the warehouse.	55	55	55	55	55	55	55	55	55	55
6	As a user logged in as an admin, I want to be able to manage the suppliers.	40	40	40	40	40	40	40	40	40	40
7	As a user logged in as an admin, I want to be able to manage the customers.	40	40	40	40	40	40	40	40	40	40
8	As a user logged in as an admin, I want to be able to manage the stocks in storage.	40	40	40	40	40	40	40	40	40	40
9	As a user logged in as a picker, I want to be able to start and end my shift.	25	25	25	25	25	0	0	0	0	0
10	As a user logged in as a picker, I want to be able to start an order.	60	60	60	60	60	60	60	60	60	60
11	As a user logged in as a picker, I should be able to stop at any point during the order and call it incomplete, and I should be able to finish an order.	90	90	90	90	90	90	90	90	90	90
12	As a user logged in as a customer, I would like to see a list of different categories and pick the products I want from each category.	40	40	40	40	40	40	0	0	0	0
13	As a user logged in as a customer, I want to be able to specify a certain amount for each product I am ordering and provide the date of shipment.	30	30	30	30	30	30	0	0	0	0
14	As a user, we want to be able to login to the system based on the different people who are going to use the system.	20	20	20	20	20	0	0	0	0	0
15	As developers, we are going to create a use case diagram along with use case descriptions for our system.	8	8	8	8	8	8	8	8	8	8
16	As developers, we are going to create activity diagrams for each use case description.	8	8	8	8	8	8	8	8	8	8
17	As developers, we are going to create one sequence diagram based on one use case description in which we find is most interesting.	3	3	3	3	3	3	3	3	3	3
18	As developers, we are going to document each step we do. We will have documentation for each design pattern we implement.	8	8	8	8	8	8	8	8	8	8
19	As developers, we are going to document the client/server system.	5	5	5	5	5	5	5	5	5	5
20	As developers, we are going to document SCRUM.	10	10	10	10	10	10	10	10	10	10
21	As developers, we are going to have documentation for Unified Processes.	3	3	3	3	3	3	3	3	3	3
22	As developers, we are going to create a project report.	50	50	50	50	50	50	50	50	50	50
23	As developers, we are going to create a process report.	25	25	25	25	25	25	25	25	25	25
Work Days		0	1	2	3	4	5	6	7	8	9
Ideal Remaining Effort		15.0	760.7	706.3	652.0	597.7	543.3	489.0	434.7	380.3	326.0
Actual Remaining Effort		15.0	815.0	815.0	715.0	715.0	670.0	500.0	500.0	500.0	445.0

The figure above shows exactly what our excel sheet looks like. It had to be cut into two as it was too long to include in one screenshot. The continuation of the table can be found in another figure below. We marked the undone tasks with the full amount of story points in black font, the ones that have been completed are marked with zeroes and with red font so it stands out.

Sprint #4 Day 10 - 09/12	Day 11 - 10/12	Day 12 - 11/12	Sprint #5 Day 13 - 12/12	Day 14 - 13/12	Day 15 - 14/12	Total Story Points
0	0	0	0	0	0	100
0	0	0	0	0	0	55
0	0	0	0	0	0	40
0	0	0	0	0	0	60
55	55	0	0	0	0	55
40	0	0	0	0	0	40
40	40	0	0	0	0	40
40	40	0	0	0	0	40
0	0	0	0	0	0	25
0	0	0	0	0	0	60
0	0	0	0	0	0	90
0	0	0	0	0	0	40
0	0	0	0	0	0	30
0	0	0	0	0	0	20
8	8	0	0	0	0	8
8	8	0	0	0	0	8
3	3	0	0	0	0	3
8	8	8	8	8	0	8
5	5	5	5	5	0	5
10	10	10	10	10	0	10
3	3	3	3	0	0	3
50	50	50	50	50	0	50
25	25	25	25	25	0	25
10	11	12	13	14	15	
271.7	217.3	163.0	108.7	54.3	0.0	815.0
295.0	255.0	101.0	101.0	98.0	0.0	815



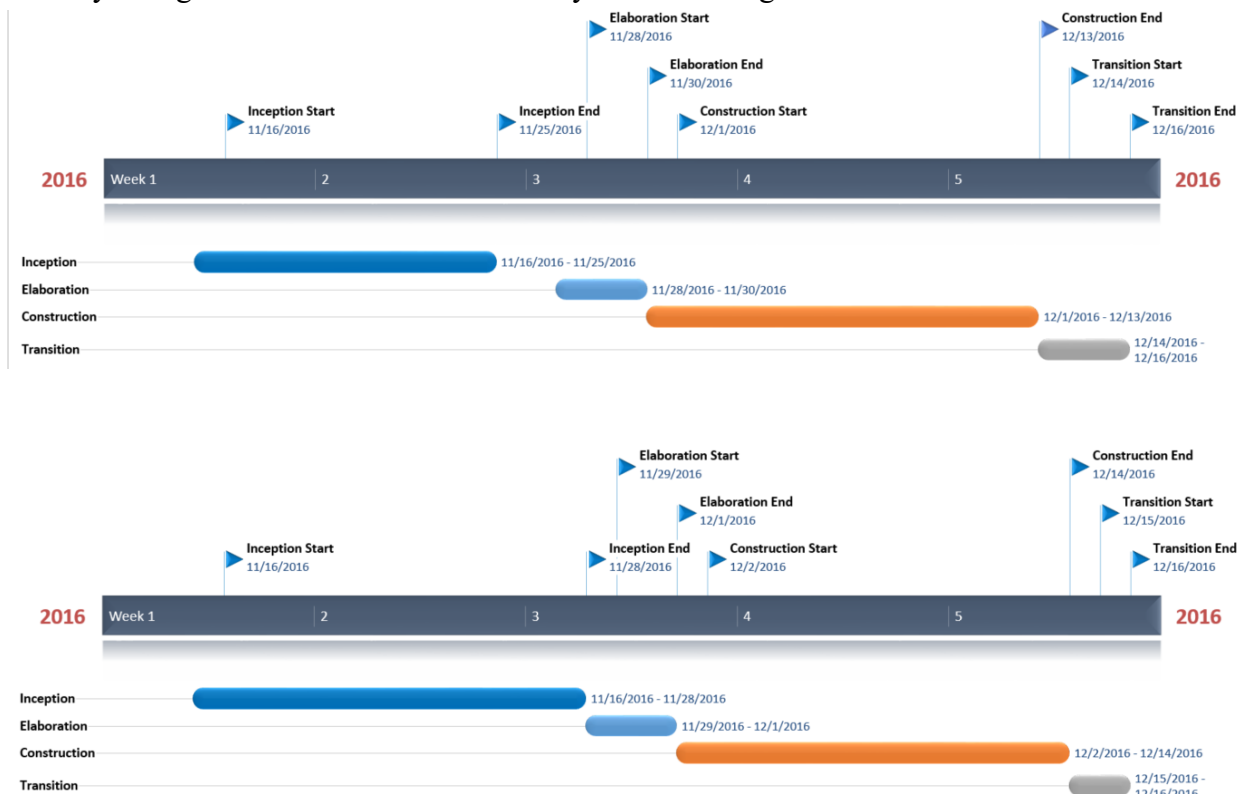
The burndown chart above shows our progress throughout our sprint period; there were many ups and downs throughout but we gladly managed to deliver a well-structured and functional system.

Unified Process

Unified process is a framework which contains four different phases:

1. Inception
2. Elaboration
3. Construction
4. Transition

We started planning the UP phases one day before handing in the first version of the project description on 16.11.2016 and the project deadline was set to 16.12.2016. In the figures below you can see how we estimated each phase in the beginning of the project period but because those dates were only estimated, they were not set in stone. Through the project period, some of the dates actually changed and that can also be seen by the second figure.



Inception

The purpose of the inception phase is to figure out what the project is about and how to get started.

During this period, we searched information regarding our project, we created the project description which covers what the system is all about and explains why we chose this topic. The product backlog was created based on the background from the project description and from that

we created the release backlog. The group contract and group SWOT were also created during this phase.

In the beginning, we planned for the inception period to be nine days long between 16.11.2016 and 25.11.2016, but because we needed more time for research we added three more days. So, the inception period actually ended on 28.11.2016.

Elaboration

During the elaboration phase, the focus was on the most important requirements of the system in order to build the core architecture of the system.

We decided that we will manage to create the core of the system by the end of first sprint, which was planned between 29.11.2016 and 01.12.2016. Most of the use cases were discussed at this moment and some of them were already done. We managed to create the connection between the client and server and we created the basic model of the system. By the end of this phase we managed to have a foundation of the system on which we will continue adding features and building the entire system.

Construction

The purpose of the construction phase is to build the rest of software. During this phase, the rest of the requirements should be covered.

In this period, we included 5 sprints, starting from 02.12.2016 until 14.12.2016. Based on the foundation created during elaboration we continued adding features, also testing the system, and documenting each step that we implemented. During the second sprint, we took a day off, on Sunday 04.12.2016 for personal reasons; that means we cut off a day from the transition part.

Transition

The purpose of the transition phase is to make sure that everything works properly and that we have everything put together nicely for deployment. This phase includes mostly testing and documenting the system.

During this period, because most of the testing was done in sprint 5 (12.12.2016 – 14.12.2016), we focused on combining the documentation created during each sprint and also writing the missing parts from the documentation. We allocated only two days to this phase because we kept documenting and testing during the whole sprinting period. By the end of the transition phase the system was tested, documented and ready for deployment.

Supervisor Meetings

22.11.2016

Today we had our first supervisor meeting. The meeting was planned by the supervisors in order to give us feedback for the first version of our project description. It was very helpful for us to know what to change in the project description and we received answers to all the questions that we had. We found out that we were on the right track and we just needed to make small improvements.

28.11.2016

During this day, we scheduled a supervisor meeting to make sure that the structure of the product backlog and the release backlog is correct and that we were on the right track. We found out that there was no need of some user stories that we included in the product backlog so we took them out. It was a very helpful meeting because we discussed also the way we planned to work and the supervisor helped us to realize that we did not plan to work very agile. It was good that we had this meeting right before we started planning our first sprint because after this we had a better overview of how we should continue.

30.11.2016

We planned a supervisor meeting because we had some problems while combining the functionality with the GUI. The main problem was that we did not know exactly where the actioner listener should be implemented because we used MVC. During this meeting, we found out that we can have a reference of the controller in the view and that helped us to go further. It was a helpful meeting because we clarified most of the problems that we had. After this meeting we started working more effectively.

Interview with Reitan Distribution

During the inception period, we discussed that it would be helpful if we manage to have a quick interview with the department colonial team leader from Reitan, Henrik Dam Andersen. Because of the time constraint, Henrik didn't have time to schedule the interview during our inception period; so he offered that we send him our questions through email and he would do his best to answer them in details before we can meet with him. We managed to prepare a list of questions for him to answer and help us get an overview of the functionality. In the beginning, we started with general questions such as: "What were your expectations of the system?" or "What are the strong points of your system? What do you like best about it?". We also asked more specific questions regarding the process of handling the goods for example: "How do you introduce the

goods in the system when received from the supplier”, “How do you keep track of the goods that you need to order from the suppliers?” or “How does the system deal with the expiration date and what happens with the goods if they expire?”. After we received answers from Henrik, we had a better understanding of the functionality of the system that they are using, but because the system that they are using is a very complex one we took some ideas which we are going to implement into our project.

On 06.12.2016, we had the meeting at Reitan Distribution. At the warehouse, Henrik gave us a tour of the warehouse to show and explain to us how things work. He started presenting to us the way goods are received, and how they are inserted into the inventory, he also explained how the system searches for an empty place to put the received pallets and how the storing and picking places in the warehouse is organized. We asked him a lot of questions to understand the entire process. An example of a question we asked was: “What information does the barcode from the pallet contain?” or “What happens when at the picking position there are a few products left and it needs to be refilled? “. After the tour was over Henrik invited us to see the system that they are using. It was a very complex system, but it was definitely beneficial that we got to explore it. He showed us their most used pages in which you could see a lot of information regarding orders and pickers. We discussed our project with Henrik and shared our ideas and what he had implemented by the time, the features that it has, and we realized that we covered most of the important parts of a warehouse management system. He was happy to hear that we are trying to create a system that can be easily upgraded in the future. The interview was extremely helpful not only functionality wise but it also gave us a great overview and an image to keep in mind all the time.

After

Reflection on Project Work

Bashar Gabbara

Group project is always challenging since there are different points of views and ideas. Fortunately, I was part of an open-minded team which took in consideration everyone’s idea and was always open for discussion. It was important that the goal of every team member was to learn as much as possible during the SEP period and improve the team-work skills that he/she possesses. In addition, having a complete, well made project was one of the top priorities, so we can get back what we deserve at the exam. Although the competence of the members wasn’t equal, the team made an efficient use of everyone’s ability in his/ her field of strength and gave the opportunity

for improvement of other skills. In our team, everyone cared, and everyone understood that no matter how good is the individual, we will not win unless we operate as one.

In this semester we learned about Agile- Unified Process and Scrum framework which I really value and feel their importance. In the beginning, the project was very big and we don't know where to start. Following those frameworks and divide the project in the order of importance and work the task in sprint, made us completely in control and confident of what we are doing. I admit that it was hard in the beginning to divide a task so it will be finished in the next sprint. How can I stop and not to finish it in the same sprint? Then I learned how nice it was that I can add to it in the next sprint and I have a part of it completely working in the previous one.

In conclusion, I was very happy with this group project. Everyone worked responsibly and did his/her best. It was nice that when someone finished her/his task, he/she came quickly to say I want more, let me do more. I believe that we all worked hard and put a lot of effort to contribute to this project and be effective group members. We worked also in the weekend which also minimized the pressure of the project. We liked what we were doing and enjoyed the project.

Bianca Sgondea

The goal for our project was to create a functional warehouse management system. The main purpose of the project was to put into practice the knowledge gained during the semester, and also to learn how to work as a group. We worked in a group of four persons. We had the chance to work together before for another project and we already got used to each other.

In the beginning, because each of us has his own way of approaching the problem, we had some small misunderstandings regarding the entire picture of the system. After we realized that each of us has different views of the system, we started communicating more effectively. Most important is that since the beginning each member had the right to express his opinion and no one was left behind. Because we enjoyed working together we were more productive than I expected. For a better time management, we applied SCRUM and unified process framework which helped us to be on the right track. The fact that we used this framework helped us to be more efficient because we did not spent time thinking about what we should do next because everything was well planned.

It is very important for me that during this project period I have learned a lot of things. I gained experience in working with SCRUM and UP, which will help me in future projects. I also learned how to manage my time in a more effective way. I had the opportunity to work in a very

good team from which I have learned many things.

In conclusion, I am very satisfied with the result, and I feel more prepared for future projects.

Mihai Cristian Pavel

The semester project period is a very important part of the semester where I can apply the knowledge accumulated during the semester and add to my skills. It is also important to be part of a good group, whose members can help each other by sharing their ideas and knowledge. I work with the same group that I worked with for the SDJ2 assignment and I was very pleased how things worked out. We were productive and we worked very efficiently. There was always respect for everybody's ideas and we choose the best of them. Happily, I got to work with the same group again. I enjoyed all the time we worked together and that made it be a positive environment where efficiency was the key word. We did get in some arguments, but I believe that they were productive because from contradictions come the best ideas and solutions. We worked as a real team and I am very proud that I was a part of that amazing group. In conclusion it was an experience that I enjoyed and I would do it again without having a second thought.

Tamara Hassan

As a group, we worked together for the SDJ-2 course assignment as practice for our SEP-2. We enjoyed working together, we were productive, and were able to enjoy it while at it. My groupmates are very innovative and are always striving to do better all the time (they don't know where to stop sometimes). They are a true inspiration when it comes to developing a system and working on it together. They were always motivated and extremely hard working. I, Tamara, really enjoyed working with them, it did not feel like a burden having to work all day, 5 days a week, with them at all. It was actually somehow exciting to see them and work on our project. We had a few rough discussions here and there but I believe we were civil and came to conclusions as a group. We were listening each other out and discussing everything thoroughly before coming to a decision. No decision was made irrationally, and with working on a big system with a group sometimes we have to meet each other half way, and this group was excellent at doing that. I truly enjoyed every minute of this project with them and I believe we accomplished more than we imagined at the beginning and that is only because we worked well as a team.

Bloom (Before/After)

KEY:

x is for the beginning of the semester

o is for the end of the semester

Fill in this form – include it in your portfolio – discuss it with the rest of the group	Bloom's level	Keeping a portfolio	Reflecting on learning	System development	SCRUM	Java Programming	Object-oriented design and programming	UML	Web Programming	Database design	Written English	Spoken English	Team working	Sharing knowledge	Project planning	Presentation / exam skills
Date: Nov 23, 2016																
Excellent	6					o								o		
	5		o	o			o	o			ox	ox	ox	x	o	o
Good	4	o	x		o	x	x	x	ox	o					x	
	3	x		x						x						x
	2															
Basic	1															
No knowledge	0				x											

➡ Fill in the above quantitative profile

➡ Name: Bashar Gabbara

Bloom's level		
Excellent	6	You know a lot about this and do it automatically" You can teach others.
	5	You know a lot about this and do it automatically".
Good	4	You can do this and are good at it, but still have to think about WHAT you are doing.
	3	You can do this if you have to or if you concentrate on doing it.
Basic	2	You have basic skills in this subject.
	1	You have heard of it or just have very basic skills / competence.
No knowledge		You have NO knowledge of this subject... no skills or competence.

Fill in this form – include it in your portfolio – discuss it with the rest of the group	Bloom's level	Keeping a portfolio	Reflecting on learning	System development	SCRUM	Java Programming	Object-oriented design and programming	UML	Web Programming	Database design	Written English	Spoken English	Team working	Sharing knowledge	Project planning	Presentation / exam skills
Date: Nov 23, 2016																
Excellent	6															
	5															
Good	4		XO	XO	O			XO	XO				XO		XO	
	3	XO				XO	XO									
	2									O	XO	XO		XO		XO
Basic	1															
No knowledge	0				X					X						

➡ Fill in the above quantitative profile

➡ Name: Bianca Sgondea

Bloom's level		
Excellent	6	You know a lot about this and do it automatically" You can teach others.
	5	You know a lot about this and do it automatically".
Good	4	You can do this and are good at it, but still have to think about WHAT you are doing.
	3	You can do this if you have to or if you concentrate on doing it.
Basic	2	You have basic skills in this subject.
	1	You have heard of it or just have very basic skills / competence.
No knowledge		You have NO knowledge of this subject... no skills or competence.

Fill in this form – include it in your portfolio – discuss it with the rest of the group	Bloom's level	Keeping a portfolio	Reflecting on learning	System development	SCRUM	Java Programming	Object-oriented design and programming	UML	Web Programming	Database design	Written English	Spoken English	Team working	Sharing knowledge	Project planning	Presentation / exam skills
Date 24/11/2016																
Excellent	6					O										
	5		XO	XO		X	XO	O			XO	XO	XO	O	O	
Good	4	XO			O			X	XO	O				X	X	XO
	3															
	2															
Basic	1															
No knowledge	0				X					X						

➡ Fill in the above quantitative profile

➡ Name...Mihai Cristian Pavel

Bloom's level		
Excellent	6	You know a lot about this and do it automatically" You can teach others.
	5	You know a lot about this and do it automatically".
Good	4	You can do this and are good at it, but still have to think about WHAT you are doing.
	3	You can do this if you have to or if you concentrate on doing it.
Basic	2	You have basic skills in this subject.
	1	You have heard of it or just have very basic skills / competence.
No knowledge		You have NO knowledge of this subject... no skills or competence.

Fill in this form – include it in your portfolio – discuss it with the rest of the group	Bloom's level	Keeping a portfolio	Reflecting on learning	System development	SCRUM	Java Programming	Object-oriented design and programming	UML	Web Programming	Database design	Written English	Spoken English	Team working	Sharing knowledge	Project planning	Presentation / exam skills
Date.....																
Excellent	6										XO	XO				
	5	0	0	0	0	0	0	0					0	0	0	0
Good	4		X	X		X	X			0			X	X	X	X
	3	X						X	XO							
	2				X											
Basic	1									X						
No knowledge	0															



Fill in the above quantitative profile



Name.....Tamara Hassan.....

Bloom's level	
Excellent	6 You know a lot about this and do it "automatically" You can teach others.
	5 You know a lot about this and do it "automatically".
Good	4 You can do this and are good at it, but still have to think about WHAT you are doing.
	3 You can do this if you have to or if you concentrate on doing it.
Basic	2 You have basic skills in this subject.
	1 You have heard of it or just have very basic skills / competence.
No knowledge	You have NO knowledge of this subject... no skills or competence.

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