

Project Plan

Group 4: Payment gateway

Client: Okapi Finance

15.11.2017.

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1. Introduction

This report will go through the processes we intend to use during the development of a web-based API for Okapi Finance. How we have chosen to handle communication between members of the group and the client will be represented here. As well as how we plan on tracking which tasks are done, being worked on and which tasks are contained in the backlog. Diagrams will be presented which provide an idea of how we are choosing to implement the project which provides a better understanding of the work we are trying to accomplish with this project.

1.1 TheAPI

The purpose of this project is to develop an API which can easily be integrated into existing web shops. This API will allow customers to purchase products online using their Okapi accounts. The API will be implemented in a way that developers can easily incorporate it into their current webshop, with the help of an application user interface which we are developing. The API will not be tailored to individual webshops rather it will be incorporated in a way that it should provide the functionality required by the webshop and Okapi Finance without having to implement big changes in the code.

1.2 Team

We are a team consisting of students who study at Mälardalens Högskola. The expected workload per student is 20 hours a week. Meetings will be held every Monday which will be used to divide up tasks, discuss current problems, provide feedback on what is currently being done and where we stand with the project as a whole.

1.3 Okapi Finance

Okapi Finance is the client who requested help with the implementation of a payment gateway. Okapi provides users with the ability to have money in an online sense even if they do not have a bank account. While not having a bank account that allows one to purchase things online may seem odd to some people, this service is targeting people in countries where it may be difficult to acquire a bank account that allows its customers to make online purchases.

2. Project organization

2.1. Project group



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2.2. Organization and communication

Being students, we are unable to set up a fixed schedule from week to week. Due to the participants in this project studying different courses, communication will take place through various services such as Slack (a communication tool for professional developers). The project will be organized and updated through a shared repository on GitHub. Meetings between the group and between the customer will be handled on a weekly basis. Reporting work hours will be recorded in an external file on Google drive. Every day after meetings or working on a project, everyone will add working hours for himself. For organization and roles on the project, we will use a Trello board. Example of the Trello board is bellow.

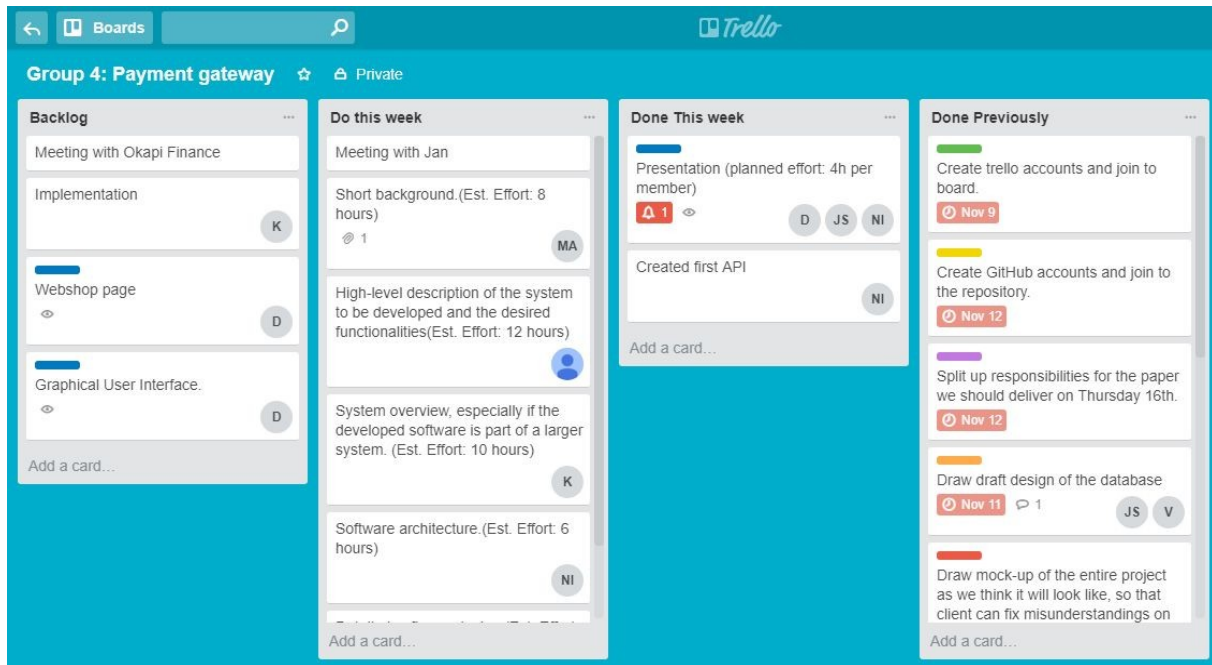


Figure 2.1: Trello board example

As it can be seen in figure 2.1, we have four different cards on our Trello board:

1. Backlog
2. Do this week
3. Done this week
4. Done previously

In the **Backlog** card, we will put tasks that are waiting to be done. After backlog card, tasks are moved to the next card called **Do this week**. In this card, we will put every task that should be finished until the end of the current week. This tasks will be arranged at our group meeting on Mondays. At the end of each week, everyone will move the tasks from **Do this week** card to **Done this week**. After that, one of us who is presenting what we have done on Monday meeting with the steering group can start on preparing his presentation. At the beginning of each week, we will also move tasks from **Done this week** card to **Done previously** where we can find all tasks that we did before. We will arrange tasks together on meetings but everyone will do the effort estimation for his own tasks.

2.3. Planned effort

Because of the different schedule, everyone will plan their own time for working on this project. We have meetings with the steering group every Monday and with our client on Tuesdays. Besides that, we will have group meetings on a weekly basis to see if everything goes as planned. Our plan is to work on the project daily, rather than doing everything in one day before the deadline. Roughly, four hours will be the daily work on average. Of course, if there are things that require some additional time or some of us face problems, we will try to help each other and we will extend planned four-hour work if needed.

2.4. External and Internal deliverables

The external deliveries will consist of documentation, what we as a group have done and what we have achieved. This will then be sent to the steering group at every deadline in the form of a summary documentation of the project work.

Internal deliveries will consist of what all parties in the group have done and how it has been done. Each individual in the group will provide documentation of the things they have worked at. Internal deliveries will be delivered every Monday before the meeting with the steering group. Before the meeting with the steering group, we will have an internal meeting to review all the parts we have set deadlines for on Trello. Also to check if there are tasks that have not been completed yet. The internal delivery is on Mondays, also in order to be able to plan before the meeting with the client on Tuesdays. This allows us to discuss and show what progress we have made in the past week. In case of late delivery, namely, if things have not been completed within the timeframe, we will review possible solutions to complete the delivery of a particular process. All deliveries within the group are presented in the form of documentation and; implementation of code and design.

2.5. Deadline and Milestone

Deadlines for the tasks will be every Monday, because of the meetings with the steering group.

- **The external deadline for the project planning is Thursday, November 16th.**
The internal deadline on Thursday, November 16th.
- **The external deadline for the Design description and Product is Thursday, November 30th.**
The internal deadline for this part of a project on Wednesday, November 29th.
- **The external and final deadline for the project report and the product is Thursday, January 11th.**
The final internal project report and final product deadline are on Friday, December 22nd.

The milestone will be along with deadline where we will review all the work and see if we have managed to complete all the tasks. Completed tasks must be tested in order to see if they meet client requirements. A real test is carried out by the completed components of the project and brief documentation of each individual in the group about what has been done, how it works, possible advantages and disadvantages. This is then uploaded to a common group of files on the Google Drive.

2.6. Activities (meetings and presentations, presentations preparation, documentation)

Meetings will be at the beginning of a new iteration, which is on Mondays. On these meetings, we will discuss within the group what everyone has done. Presentation of the work will be done during the Monday meeting with the steering group. After the meeting, we will prepare the next iteration and review things that need to be done as well as presented before the meeting with the client on Tuesday.

Below, the Gantt chart is presented, as it is more easy to keep up with the project in that way.

		Task Mode ▾	Task Name ▾	Duration ▾	Start ▾	Finish ▾	Predecessors ▾
1			Payment gateway development	43 days	Tue 14/11/17	Thu 11/01/18	
2			Analysis/Software Requirements	5,13 days	Tue 14/11/17	Tue 21/11/17	
9			Design	3 days	Tue 21/11/17	Fri 24/11/17	2
15			Implementation/Coding	34 days	Fri 24/11/17	Thu 11/01/18	9
22			Group meetings	20,13 days	Mon 20/11/17	Mon 18/12/17	
32			Monday meetings with the steering group	20,04 days	Mon 20/11/17	Mon 18/12/17	
38			Preparing presentations	22,25 days	Mon 20/11/17	Wed 20/12/17	
48			Presentations	20,38 days	Thu 23/11/17	Thu 21/12/17	
52			Project report	3 hrs	Thu 11/01/18	Thu 11/01/18	

Figure 2.2: Task groups of the project

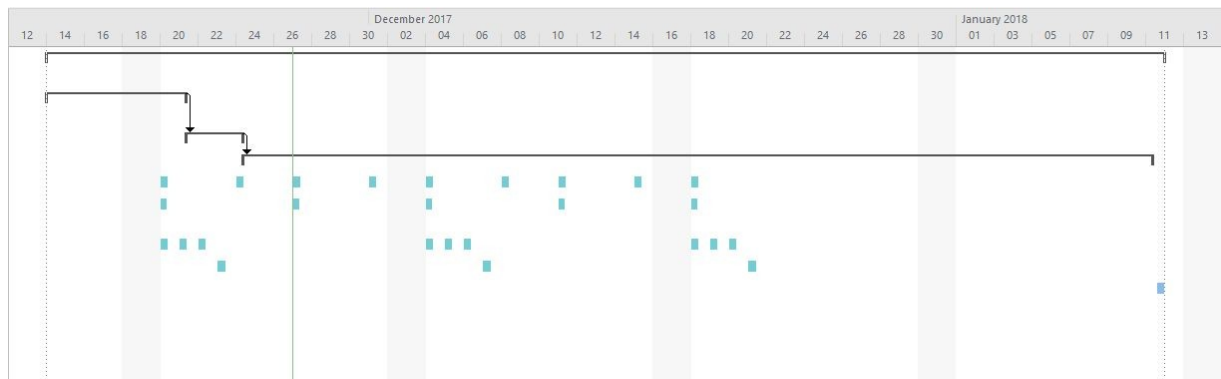


Figure 2.3: Gantt chart for the whole project

More detailed project tasks are listed below.

		Task Mode ▾	Task Name ▾	Duration ▾	Start ▾	Finish ▾	Predecessors ▾
1			▶ Payment gateway development	43 days	Tue 14/11/17	Thu 11/01/18	
2			▶ Analysis/Software Requirements	5,13 days	Tue 14/11/17	Tue 21/11/17	
3			Draft preliminary software specifications	2 days	Tue 14/11/17	Wed 15/11/17	
4			Review software specifications with team	8 hrs	Thu 16/11/17	Thu 16/11/17	3
5			Drawing mock-up of the system	2 hrs	Fri 17/11/17	Fri 17/11/17	4
6			Drawing mock-up of the database	3 hrs	Fri 17/11/17	Fri 17/11/17	4
7			Incorporate feedback on software specifications	1 hr	Tue 21/11/17	Tue 21/11/17	6
8			Analysis complete	0 days	Tue 21/11/17	Tue 21/11/17	7
9			▶ Design	3 days	Tue 21/11/17	Fri 24/11/17	2
10			Database model design	2 days	Tue 21/11/17	Thu 23/11/17	
11			UX design for admin panel	2 days	Tue 21/11/17	Thu 23/11/17	
12			UX design for webshop	1 day	Tue 21/11/17	Wed 22/11/17	
13			Final system design	3 days	Tue 21/11/17	Fri 24/11/17	
14			Design complete	0 days	Fri 24/11/17	Fri 24/11/17	13
15			▶ Implementation/Coding	34 days	Fri 24/11/17	Thu 11/01/18	9
16			Database implementation	3 days	Fri 24/11/17	Wed 29/11/17	
17			Webshop development	7 days	Fri 24/11/17	Tue 05/12/17	
18			API development	25 days	Wed 29/11/17	Wed 03/01/18	16
19			API integration with the webshop	6 days	Wed 03/01/18	Thu 11/01/18	18
20			Administration panel development	6 days	Wed 03/01/18	Thu 11/01/18	18
21			Implementation complete	0 days	Thu 11/01/18	Thu 11/01/18	20
22			▶ Group meetings	20,13 days	Mon 20/11/17	Mon 18/12/17	
23			Group meetings 1	1 hr	Mon 20/11/17	Mon 20/11/17	
24			Group meetings 2	1 hr	Fri 24/11/17	Fri 24/11/17	
25			Group meetings 3	1 hr	Mon 27/11/17	Mon 27/11/17	
26			Group meetings 4	1 hr	Fri 01/12/17	Fri 01/12/17	
27			Group meetings 5	1 hr	Mon 04/12/17	Mon 04/12/17	
28			Group meetings 6	1 hr	Fri 08/12/17	Fri 08/12/17	
29			Group meetings 7	1 hr	Mon 11/12/17	Mon 11/12/17	
30			Group meetings 8	1 hr	Fri 15/12/17	Fri 15/12/17	
31			Group meetings 9	1 hr	Mon 18/12/17	Mon 18/12/17	

Figure 2.4: All tasks in the project (1/2)























GANIT CHART	32			Monday meetings with the steering group	20,04 days	Mon 20/11/17	Mon 18/12/17	
	33			Monday meetings with the	20 mins	Mon 20/11/17	Mon 20/11/17	
	34			Monday meetings with the	20 mins	Mon 27/11/17	Mon 27/11/17	
	35			Monday meetings with the	20 mins	Mon 04/12/17	Mon 04/12/17	
	36			Monday meetings with the	20 mins	Mon 11/12/17	Mon 11/12/17	
	37			Monday meetings with the	20 mins	Mon 18/12/17	Mon 18/12/17	
	38			Preparing presentations	22,25 days	Mon 20/11/17	Wed 20/12/17	
	39			Preparing presentations 1	2 hrs	Mon 20/11/17	Mon 20/11/17	
	40			Preparing presentations 2	2 hrs	Tue 21/11/17	Tue 21/11/17	
	41			Preparing presentations 3	2 hrs	Wed 22/11/17	Wed 22/11/17	
GANIT CHART	42			Preparing presentations 4	2 hrs	Mon 04/12/17	Mon 04/12/17	
	43			Preparing presentations 5	2 hrs	Tue 05/12/17	Tue 05/12/17	
	44			Preparing presentations 6	2 hrs	Wed 06/12/17	Wed 06/12/17	
	45			Preparing presentations 7	2 hrs	Mon 18/12/17	Mon 18/12/17	
	46			Preparing presentations 8	2 hrs	Tue 19/12/17	Tue 19/12/17	
	47			Preparing presentations 9	2 hrs	Wed 20/12/17	Wed 20/12/17	
	48			Presentations	20,38 days	Thu 23/11/17	Thu 21/12/17	
	49			Presentations 1	3 hrs	Thu 23/11/17	Thu 23/11/17	
	50			Presentations 2	3 hrs	Thu 07/12/17	Thu 07/12/17	
	51			Presentations 3	3 hrs	Thu 21/12/17	Thu 21/12/17	
	52			Project report	3 hrs	Thu 11/01/18	Thu 11/01/18	

Figure 2.4: All tasks in the project (2/2)

3. System description

3.1. Domain and problem

The domain related to the project is divided into two parts. First part is the web shop that the API is going to be integrated with. The webshop domain involves customers and the company deploying the webshop site and their respective intentions. However, these intentions are hard to generalize since they are very subjective depending on company and customer.

The second part of the overall domain for the project is the fintech domain since Okapi is a fintech company. The fintech domain involves a company deploying technological solutions to serve financial demands and to provide financial services. In this case, Okapi's main goal is to bank the unbanked. In the context of this project, Okapi wants to provide a financial solution for online payment. This solution is going to be used by companies in order to provide their customer's methods of paying on their web shops by using Okapi payment system.

With the domain explained, the problem needed to be solved is the following. Our client, the Okapi, wants to provide their company customer with a tool, which will allow their customers to pay online in webshops with their Okapi accounts. To clarify Okapi provides their private customers with so-called virtual wallet, these virtual wallets can contain VISA cards or an account balance. Both of these can be used to pay purchases with.

3.2. Existing systems

There is currently no existing system in which a payment gateway has been enabled. However, there is a database that contains Customer information such as their credit balance and personal information including contact information.

We do not have access to their database which makes truly implementing a working API which is connected to their network impossible. However, we are implementing the API in a way that it can be modified easily to work with their current system.

Our system is divided into three parts, Okapi Payment Gateway API, a webshop for the demonstration and Administration panel. Our system consists of three roles, Global Administrator, Company Administrator, and Customer. Roles with their respective privileges for each part of the system are shown in use case diagrams.

As said previously, they do not have a payment gateway, but that does not mean that we cannot incorporate work that they have done into our own project. One thing that could be of great value is their database. Their database contains information about customers that could be crossed over with the database we are creating. This would allow the use of currently entered customer information in the implementation of the payment gateway.

However, their customer database contains sensitive information, so in our implementation, one thing we can do is to create a similar dummy database and functions which target this structure. If Okapi chooses to incorporate our project into its existing system they can easily make small changes to the code in order to target their currently existing database and its structure.

3.3. Desired functionality

To capture the desired functionality in the product, we constructed use case diagrams which visualize the intended ways of use for involved actors. Also, each functional requirement is explained in detail, with the description, actors involved in that requirement, and preconditions required for that requirement. There are also explained the main scenario of executing this requirement and extensions for this requirement.

Requirements for Administrative webshop will be same as Payment Gateway intended for roles of Global Administrator, Company Administrator, just with client-side implementation. There is no need to draw same use case diagram and write same requirements twice.

In the webshop when a visitor browses certain product, add it to cart and want to check out, he becomes a premium customer in the Payment gateway. He will choose payment method, if it is VISA or Okapi, and pay his product.

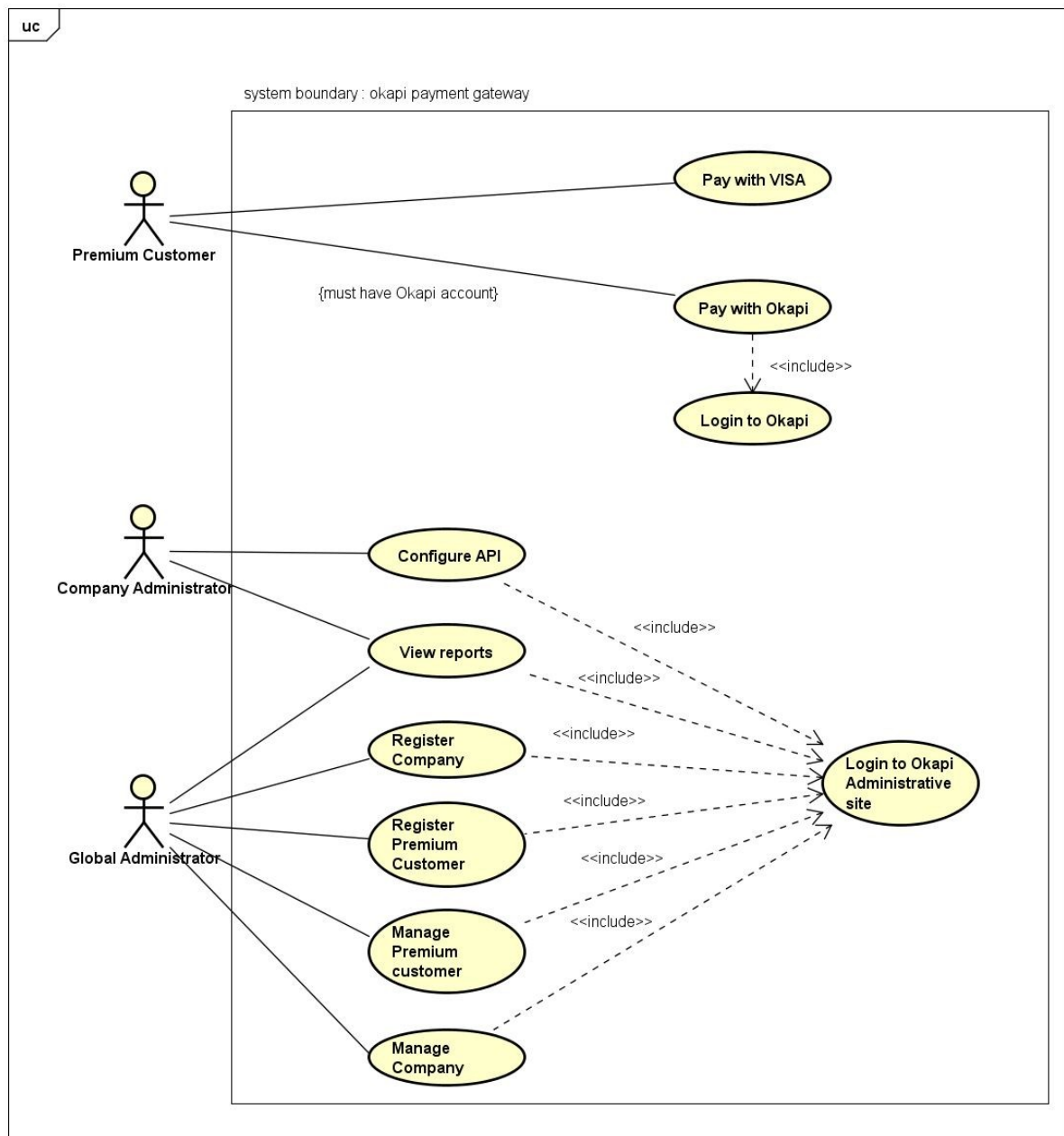


Figure 3.1: Use Case diagram for payment gateway

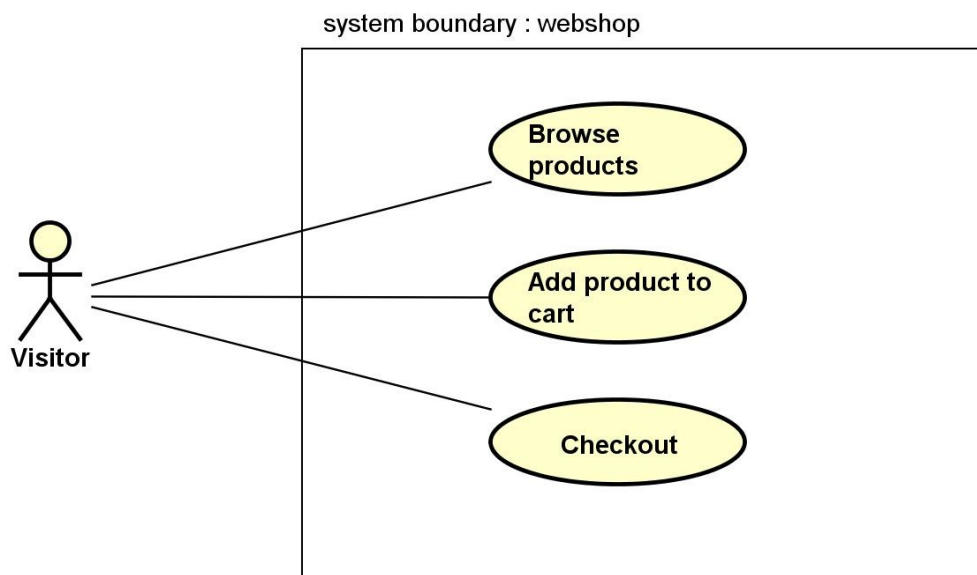


Figure 3.2: Use diagram for the demonstration webshop

Okapi Payment Gateway

Login into administrative system	
Description	Administrator/Company logs into the Okapi system.
Actor/Actors	Administrator/Company
Preconditions	Administrator/Company must have Okapi Account
Main Scenario	1. Administrator/Company enters their user credentials. 2. The system verifies credentials. 3. System logs in the administrator to the administration page
Extensions	1. Validation fails <ul style="list-style-type: none"> a) System displays that the validation failed and reason b) System allows retry 2. If user is company <ul style="list-style-type: none"> a) System logs company into the company-specific page

Register Company	
Description	An administrator can register a new company in the Okapi system.
Actor/Actors	Administrator
Preconditions	None
Main Scenario	<ol style="list-style-type: none"> 1. Navigate to register new company page. 2. Enter the new companies details. 3. Validate inputted information. 4. Check company details against sanction lists. 5. The system registers the new company.
Extensions	<ol style="list-style-type: none"> 1. Validation of details failed. <ol style="list-style-type: none"> a) Display that validation failed to the administrator and reason. b)The system allows for retry. 2. Company matched towards sanctions list <ol style="list-style-type: none"> a)Display that the sanction check failed. b)The system allows for retry.

Manage Company	
Description	The administrator manages the details of a registered company.
Actor/Actors	Administrator
Preconditions	Company to be managed must exist in system
Main Scenario	<ol style="list-style-type: none"> 1. Navigate to manage company page. 2. Enter id for the company to be managed. 3. The system displays related details. 4. Administrator alters wanted details. 5. The administrator clicks “confirm changes”. 6. The system validates the changes. 7. System updates details.
Extensions	<ol style="list-style-type: none"> 1. Identifier didn't match <ol style="list-style-type: none"> a) Display to the administrator that the company could not be found. b)The system allows the user to input new company id. 2. Validation failed <ol style="list-style-type: none"> a) Display to the administrator that validation failed and reason. b)The system allows the administrator to try again.

Register Customer	
Description	An administrator can register a new customer in the Okapi system.
Actor/Actors	Administrator
Preconditions	None
Main Scenario	<ol style="list-style-type: none"> 1. Navigate to register new customer page. 2. Enter the new customer details. 3. Validate inputted information. 4. Check customer details against sanction lists. 5. The system registers the new customer.
Extensions	<ol style="list-style-type: none"> 1. Validation of details failed. <ol style="list-style-type: none"> a) Display that validation failed to the administrator and reason. b) The system allows for retry. 2. Company matched towards sanctions list <ol style="list-style-type: none"> a) Display that the sanction check failed. b) The system allows for retry.

Manage Customer	
Description	An administrator can register a new customer in the Okapi system.
Actor/Actors	Administrator
Preconditions	Customer must exist in system
Main Scenario	<ol style="list-style-type: none"> 1. Navigate to manage customer page. 2. Enter id for the customer to be managed. 3. The system displays related details. 4. Administrator alters wanted details. 5. The administrator clicks “confirm changes”. 6. The system validates the changes. 7. System updates details.
Extensions	<ol style="list-style-type: none"> 1. Identifier didn't match <ol style="list-style-type: none"> a) Display to administrator that the customer could not be found. b) The system allows the user to input new customer id. 2. Validation failed <ol style="list-style-type: none"> a) Display to the administrator that validation failed and reason. b) The system allows the administrator to try again.

View Reports	
Description	Administrator and/or Company can filter and view reports.
Actor/Actors	Administrator
Preconditions	Administrator/company user must be logged in.
Main Scenario	<ol style="list-style-type: none"> 1. Navigate to the view reports page. 2. Enter company ID to get a report for. 3. The system generates a report for related company ID. 4. System displays generated a report.
Extensions	<ol style="list-style-type: none"> 1. If user is company <ol style="list-style-type: none"> a) The system generates a report for the company. b) System displays generated a report. 2. Company ID didn't match <ol style="list-style-type: none"> a) The system displays that ID could not be found. b) The system allows for retry.

Configure API	
Description	The company can configure the API for their webshop.
Actor/Actors	Company
Preconditions	Company user must be logged in
Main Scenario	<ol style="list-style-type: none"> 1. Navigate to the configure API page. 2. Edit parameters currently in use.
Extensions	None

Pay with VISA	
Description	Customer pays with VISA Card
Actor/Actors	Customer
Preconditions	Customers must be logged in and have valid VISA card
Main Scenario	<ol style="list-style-type: none"> 1. Navigate to the Payment page

	2. User chooses VISA card as payment method
Extensions	1. Validation of details failed. <ul style="list-style-type: none"> a) Display that validation failed to the customer and reason. b) The system allows for retry. 2. Customer's VISA card was not verified

Pay with OKAPI	
Description	Customer pays with OKAPI
Actor/Actors	Customer
Preconditions	Customers must be logged in and valid OKAPI account
Main Scenario	1. Navigate to the Payment page 2. User chooses OKAPI as payment method
Extensions	1. Validation of details failed. <ul style="list-style-type: none"> a) Display that validation failed to the customer and reason. b) The system allows for retry. 2. Customer doesn't have OKAPI account <ul style="list-style-type: none"> a) System redirects customer for registration on OKAPI

Login to OKAPI	
Description	Customers log in to OKAPI account
Actor/Actors	Customer
Preconditions	Customers must be logged in and valid OKAPI account
Main Scenario	1. Navigate to OKAPI login page at website 2. User insert his username and password
Extensions	1. Validation of details failed. <ul style="list-style-type: none"> a) Display that validation failed to the customer and reason. b) The system allows for retry. 2. Customer doesn't have OKAPI account <ul style="list-style-type: none"> a) System redirects customer for registration on OKAPI

Demonstrative Webshop

Browse products	
Description	Using a search bar and/or other tools, visitor can browse products in the webshop
Actor/Actors	Customer
Preconditions	None
Main Scenario	1. Customer inputs keyword into the search bar 2. The system will display hits.
Extensions	None

Add product to cart	
Description	Add product to cart
Actor/Actors	Customer
Preconditions	None
Main Scenario	1. Visitor selects a product. 2. Clicks "add to cart" 3. System displays, "Product has been added to cart"
Extensions	1. Product is not in stock a) Add to cart button will be greyed out.

Checkout	
Description	The customer proceeds to the checkout and will see full details of the cart.
Actor/Actors	Customer
Preconditions	None
Main Scenario	1. Visitor clicks proceed to checkout button 2. System will display everything in the cart 3. Visitor clicks continue to payment button
Extensions	1. Visitor edits the contents of the cart a) Cart is updated accordingly

3.6. Non-functional requirements

Security

Security is the main aspect of this system and a lot of effort will be put into this part. There are some security regulations about VISA card like encryption of data and other secure transaction related concerns, such as not storing CVV numbers, hiding card numbers and othersensitive data. Users information also should be secured and encrypted.

Maintenance

The system should be well adjusted for maintenance, in the sense that it is needed to minimize time and influence on the overall work. To achieve this goal, all work on the system should be done on the time when the system is under significantly less load.

Usability

GUI design will follow modern and the most usable trends from the field of UX/UI design. This way users can effectively and efficiently do their tasks. It also enables easy usage for people who are not professionals when it comes to using computers.

Portability

End users access the system as a web application. This ensures high portability by providing customers to access it on a wide variety of devices. The most important thing on these devices are installed supported web browsers, and that an internet connection is available.

Scalability

The definition of scalability is the ability of the system to adapt to increased processing requirements in a predictable way without the system becoming too complex, expensive and impractical. With a good system, the client will be able to add new desirable functionalities and increase the number of users easily. Increasing the number of users and requests will not reduce the response time of the system, and the system will work efficiently.

4. Initial project backlog

This is a list of the system's features to be implemented (from highest to lowest priority):

- Okapi Payment Gateway
 - API

Our highest priority is to develop API in a way that company's as Okapi's associates could easily integrate with their existing webshops and that will handle the payment process. This part of the system will be invisible to the end-users and it will be triggered only when they choose payment button from the webshop. It is supposed to create transaction contract and get transaction acknowledgment.

Estimated working time: 20 person days

- Database

The database will be used for storing user data and transactions. For this purpose, we will implement an imitation of Okapi's database that will have only necessary tables for a demonstration of the system. Since Okapi's original database is developed in SQL it is required that our imitation of the database is also developed in SQL.

Estimated working time: 7 person days

- Payment Page

Second highest priority is to develop payment gateway for Okapi. It is supposed to be some kind of a popup window or a separate webpage that will handle payments for Okapi users. It has to be secure and safe from malicious users on the internet and it also has to take care of user's privacy. This is the most important part of the system for the end-users since they will see it every time they are making payment to a webshop by using Okapi platform. We should implement two payment options on the payment page, for Okapi and Visa users. Okapi users will enter their Okapi credentials, while Visa users will enter their card number. Payment page should show payment details and then execute the payment.

Estimated working time: 20 person days (along with API)

- Admin Panel

Admin should be able to log in to the system and then register and manage companies and customers and view reports and all relevant data as well. Admin panel has medium priority.

Estimated working time: 7 person days

- CompanyPanel

The company representative should be able to login to the system and view the reports related to his company and configure API for his webshop. Company panel has medium priority.

Estimated working time: 7 person days (Along with Admin panel)

- WebShop

Webshop will be used only for a simulation of triggering payment process and making the transaction between Okapi and a webshop company. Any modern technology for websites development is allowed. This is the part of the system with the lowest priority since in reality any webshop could be used and it is not the essence of the project. It should have a shopping cart and implement API of Okapi Payment Gateway.

Estimated working time: 8 person days