GROUP 15

FDM Expenses Manager

ECS506U Software Engineering Group Project

Requirements Elicitation Report

Contents

0. Introduction

The purpose of this report is to describe the identified and analysed core and optional requirements of the proposed system, FDM Expenses Manager.

The different requirements were gathered primarily from an attentive analysis of the first project domain analysis [1], mainly from the following sections: tasks and procedures, personas or roles, environment.

This report also includes a use case diagram aimed at showing the interaction between the system users and the system itself. This is achieved by representing certain user requirements as use cases in the diagram, linked to the appropriate actor representing the user who can perform said action. The appended use case analysis further explains a selected number of use cases more in depth, to show the requirements for the action to take place, as well as the flow of events that lead to the completion of the chosen task.

Finally, the report includes an assessment of the project risks as well as a list of proposed actions and strategies the team is committed to respecting to best avoid or minimise said risks.

This final analysis was the outcome of an attentive research on risk assessment for software engineering projects, adapted and altered on our system's needs and project scope, as well as tailored on the group members' capabilities and level of interaction with the different project stages.

[1] Group 15, "FDM Expenses Manager: Domain Analysis," Queen Mary University of London, Feb. 2023.

1. List of Requirements

This section contains a list of requirements for the FDM Expenses Manager system. The table below (Table 1.1) represents a glossary for further explanation on specific abbreviations used in the report. These abbreviations are used in conjunction in the Requirements Table as follows: NFS is “Non-Functional Requirement for System”, FLM is “Functional Requirement for Line Managers” and so on.

1.1 Glossary

ABBREVIATION	MEANING	REFERS TO	EXPLANATION
F	Functional Requirement	Requirement type	These RQs refer to desired features that the system shall provide
NF	Non-Functional Requirement	Requirement type	These RQs refer to restrictions or constraints on the system’s design
E	Employee / Internal Staff	User type	These RQs explain actions that all Employees and Internal Staff can make
LM	Line Manager	User type	These RQs explain actions that all Line Managers can make
C	Consultant	User type	These RQs explain actions that all Consultants can make
A	Administrator	User type	These RQs explain actions that all Admins can make
S	System	System Entity	These RQs explain functionalities the system will have and actions it will automatically perform
X	Expense Claim / Expense Proof / Report	System Entity	These RQs explain the features of each Expense Claim and related entities, i.e Expense Proof and Report
M	Must Have (Core)	Priority	These RQs are fundamental and are to be implemented in the system’s prototype
O	Optional	Priority	These RQs are optional and can be included after the first prototype development
(D)	Data Requirement	Requirement Specification	These RQs describe what data is stored in the system for each entity or user

1.2 Functional Requirements

EMPLOYEES / INTERNAL STAFF*				
ID	**REQUIREMENT**	**TYPE**	**PRIORITY**	**USE CASE**
FE1	Each Employee must be able to login with their personal email and password	Functional	M	Login
FE2	Each Employee is identified by a unique personal email	Functional (D)	M	All
FE3	Each Employee has a personal password	Functional (D)	M	All
FE4	Employees shall be able to see their list of submitted claims and relative statuses	Functional	M	Check Previous Claims
FE5	Employees shall be able to organise their previous claims by applying filters on the Claims list (i.e. filter by date, filter by outcome, etc.)	Functional	O	Organise Claims
FE6	Employees must be able to make 4 types of expense claims: Travel claim, Meal claim, Overnight Stay claim and Business Purchase claim	Functional	M	Claim travel expense, Claim Meal Expense, Claim overnight stay Expense, Claim purchases expense
FE7	Employees must be able to submit a proof of expenses while submitting a claim (VATs, receipts)	Functional	M	Add Expense Proof
FE8	Employees must be able to view their personal information stored in the system: name, email, role, budget allowance, reliability score, etc.	Functional (D)	M	Show Information
FE9	Employees must be able to update their password	Functional	M	Update Password
FE10	Employees must be able to view their personal reliability score	Functional	M	Display Score
FE11	Employees must be able to view their remaining budget allowance	Functional	M	Display Budget

*Internal Staff have the same attributes and behaviours as Employees, so every use case and requirement for Internal Staff is captured in the table above.

Note that all requirements for Employees / Internal staff, including data requirements, are also requirements for Line Managers and Consultants, as these extend the functionalities of general employees.

CONSULTANTS				
ID	**REQUIREMENT**	**TYPE**	**PRIORITY**	**USE CASE**
FC1	Consultants are distinguished by their location and their currency of choice	Functional (D)	M	All
FC2	Consultants must be able to change their location	Functional	M	Change Location
FC3	Consultants must be able to change their currency	Functional	M	Change Currency
LINE MANAGERS				
FLM1	Line Managers are identified by the list of Employees they oversee	Functional (D)	M	All
FLM2	Line Managers are distinguished by the list of Employee claims they are in charge of processing	Functional (D)	M	All
FLM3	Line managers must be able to approve claims	Functional	M	Approve Claim
FLM4	Line managers must be able to report claims (i.e. reject claims) for fraudulent suspicions or for incorrect information	Functional	M	Report Claim
FLM5	Line managers shall be able to view the information of all the employees they oversee	Functional	M	Show Employees list
FLM6	Line managers should be able to change the allowed budget for the employees they oversee	Functional	O	Change Employee Allowance
FLM7	Line managers should be able to view the information of all the claims they are in charge of processing or have already processed	Functional	M	Check Employee claims
ADMINISTRATORS**				
FA1	Admins must be able to access the desktop app to perform any action	Functional	M	All
FA2	Admins must be able to add employee accounts to the system	Functional	M	Add Account
FA3	Admins must be able to remove employee accounts from the system	Functional	M	Remove Account
FA4	Admins must be able to access the system with their own credentials: personalised email and access code	Functional (D)	M	Login

**Administrators are secondary actors, like developers or FDM staff (finance department, HR) who have access to the system for mainly maintenance purposes, not primary actors in the system as depicted in the project Domain Analysis [1]. Admins have access to the backend infrastructure of the system through the Windows based desktop application [1].

SYSTEM				
ID	**REQUIREMENT**	**TYPE**	**PRIORITY**	**USE CASE**
FS1	The system should distinguish four different types of users: Internal Staff, Consultants, Line Managers and Admins	Functional	M	All
FS2	The system must have specific tailored interfaces for each User category / type	Functional	M	All
FS3	The system shall generate monthly/ weekly expenditure sheets	Functional	O	N/A
FS4	The system should store the contact email of the finance department representative	Functional (D)	O	N/A
FS5	The system should store the contact email of the HR representative	Functional (D)	O	N/A
FS6	The system should automatically forward approved claims to the finance department	Functional	O	Approve Claim
FS7	The system should automatically forward reported claims (reports) to HR	Functional	O	Report Claim
FS8	The system should automatically send the generated expenditure sheets to the finance department	Functional	O	N/A
FS9	The system shall notify an employee’s line manager if the employee exceeds their allowance	Functional	M	N/A
FS10	The system shall automatically notify an employee’s line manager if the employee’s reliability score goes below 65%	Functional	M	Report Claim
FS11	The system should automatically send a reminder to each employee to submit any claim before the set deadline***	Functional	O	N/A
FS12	The system shall store all claims regardless of outcome	Functional	M	Claim Expenses

FS13	The system should automatically pre-fill basic employee info (name, email) for any expense claim	Functional	O	Claim Expenses
FS14	The system shall be available for access from anywhere in the world	Functional	O	All
FS15	The System must be able to generate unique ID numbers for Expense Claims and Proofs of Expenses	Functional	M	Claim Expenses, Add Expense Proof
FS16	The System shall notify an Employee when a Line Manager has processed one of their claims	Functional	O	Approve Claim, Report Claim
FS17	The System shall make appropriate value changes on an Employee's reliability score after each claim is processed	Functional	M	Approve Claim, Report Claim
FS18	The System shall make appropriate value changes on an Employee's remaining budget allowance after each claim is approved	Functional	M	Approve Claim
FS19	The System shall not allow a claim to be submitted until a (valid) Proof of Expense is added to the Claim request	Functional	M	Claim Expenses, Add Expense Proof

***As in accordance with FDM the deadline to submit any claim pcm is the last Friday of each month at 17:00 GMT.

EXPENSE CLAIMS				
ID	**REQUIREMENT**	**TYPE**	**PRIORITY**	**USE CASE**
FX1	Each Expense Claim is identified by a unique ID generated by the system	Functional (D)	M	Claim Expenses
FX2	Each Expense Claim is identified by the email of the Employee who submitted the claim	Functional (D)	M	Claim Expenses
FX3	Each Expense Claim is identified by the email of the Line Manager who is in charge of processing it	Functional (D)	M	Claim Expenses
FX4	Each Expense Claim is identified by the ID of the Proof of Expense related to it	Functional (D)	M	Claim Expenses, Add Expense Proof
FX5	Each Expense Claim is identified by the date of submission of the claim	Functional (D)	M	Claim Expenses

FX6	Each Expense Claim has a status information that indicates whether the claim is pending, approved or rejected/reported	Functional (D)	M	Claim Expenses, Approve Claim, Report Claim
FX7	Every Expense Claim must include the expenditure amount and currency (standard currency for all employees is GBP)	Functional (D)	M	Claim Expenses
TRAVEL CLAIMS				
FX8	The system stores the date(s) of travel of each Travel Claims	Functional (D)	M	Claim travel expense
FX9	The system stores the transportation type (aircraft, train, etc.) of each Travel Claim	Functional (D)	M	Claim travel expense
FX10	The system stores the travel motive of each Travel Claim	Functional (D)	M	Claim travel expense
OVERNIGHT STAY CLAIMS				
FX11	The system stores the structure type (hotel, BnB, hostel) of each Overnight Stays Claim	Functional (D)	M	Claim overnight stay Expense
FX12	The system stores the structure name and location of each Overnight Stays Claim	Functional (D)	M	Claim overnight stay Expense
FX13	The system stores the check-in and check-out dates of each Overnight Stays Claim	Functional (D)	M	Claim overnight stay Expense
MEAL CLAIMS				
FX14	The system stores the meal type (business lunch, hotel meal, etc.) of each Meal Claim	Functional (D)	M	Claim Meal Expense
FX15	The system stores the dining location and structure of each Meal Claim	Functional (D)	M	Claim Meal Expense
FX16	The system stores the date of the meal of each Meal Claim	Functional (D)	M	Claim Meal Expense
PURCHASE CLAIMS				
FX17	The system stores the purchase type (WFH equipment, petrol, call expenses, etc.) of each Purchase Claim	Functional (D)	M	Claim purchases expense
FX18	The system stores the Item/Items purchased and store of purchase of each	Functional (D)	M	Claim purchases expense

	Purchase Claim			
FX19	The system stores the date of purchase of each Purchase Claim	Functional (D)	M	Claim purchases expense
EXPENSE PROOFS				
FX20	Each Proof of Expense is identified by a unique identification number generated by the system	Functional (D)	M	Add Expense Proof
FX21	Each Proof of Expense is identified by the ID of the Expense Claim it refers to	Functional (D)	M	Add Expense Proof
FX22	Each Proof of Expense has to be submitted as a png or pdf file	Functional	M	Add Expense Proof
FX23	Each Proof of Expense has an optional typed in VAT value for the Employee to manually fill (in case the file doesn't include VAT explicitly)	Functional	O	Add Expense Proof
REPORTS				
FX24	Each Report is identified by the ID of the Expense Claim it refers to	Functional (D)	M	Report Claim
FX25	Each Report is identified by the email of the Employee who filed the claim and of the Line Manager who reported the claim	Functional (D)	M	Report Claim
FX26	Each Report has an optional Extra Information field with the reason of the Report (optionally given by the Line Manager who reported the claim)	Functional	O	Report Claim

1.3 Non-Functional Requirements

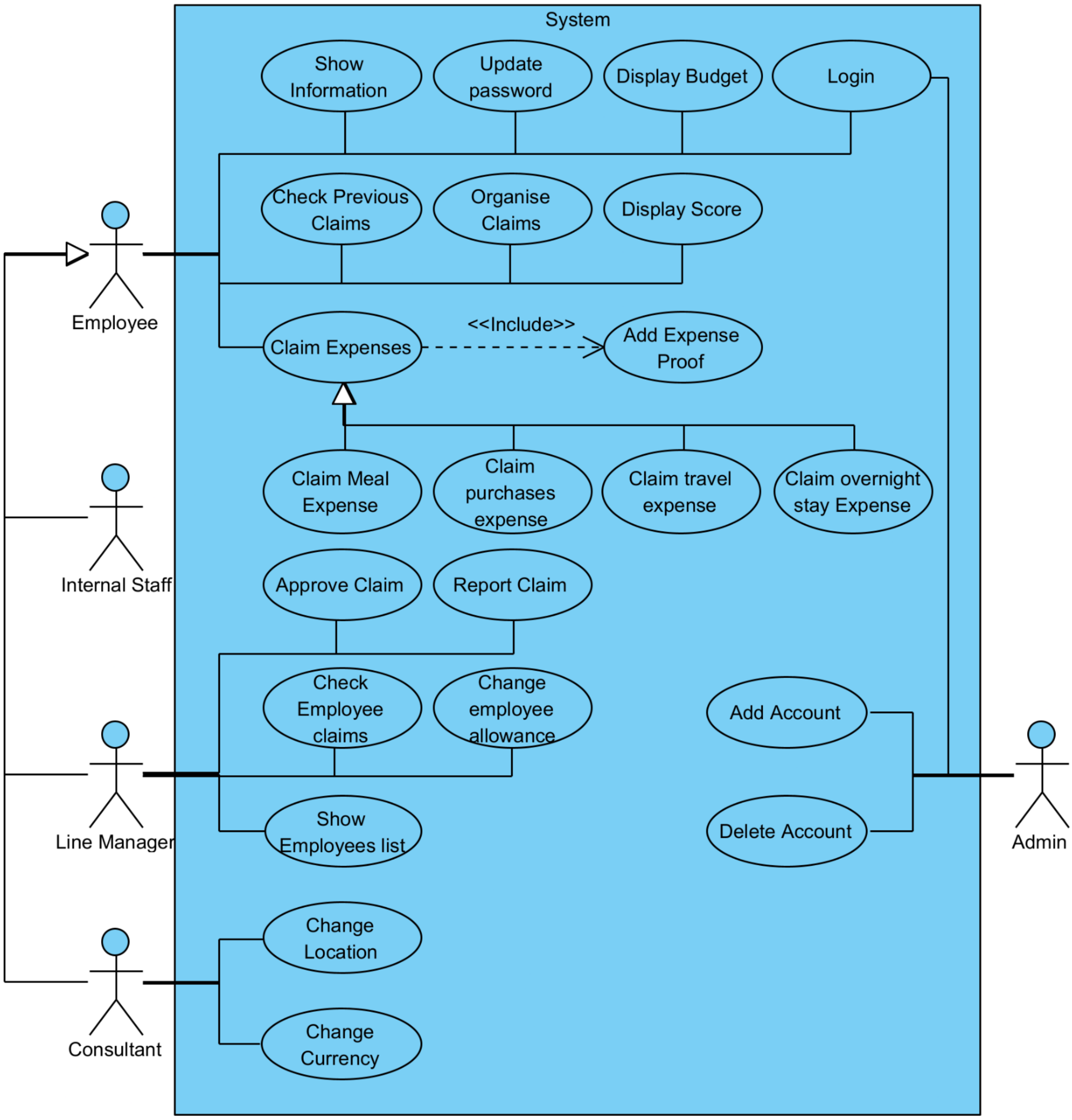
ID	REQUIREMENT	TYPE	PRIORITY	USE CASE
NF1	The system shall authenticate a User and complete the login within 5 seconds	Performance	O	Login
NF2	The system shall optimally run on the following web browsers running the latest versions: Google Chrome, Firefox, Safari	Platform	M	All
NF3	The backend web-based application for Admins shall run on a Windows platform	Platform	M	All
NF4	User must be able to login within 3 clicks	Usability	M	Login

NF5	The system should be able to load a claim within 5 seconds	Performance	O	Check Previous Claims, Check Employee Claims
NF6	User shall be able to perform any specified use case scenario within 10 minutes	Usability	M	All
NF7	System must be up 99.9% of the time	Reliability	O	All
NF8	Users must be able to apply any filter within 4 clicks	Usability	O	Organise Claims
NF9	FDM Expense Manager must be able to handle 6000 users concurrently	Capacity	M	All
NF10	FDM Expense Manager shall be available in English	Accessibility	M	All
NF11	The system should time out users for 5 minutes if they fail to log in 5 times in a row	Security	M	Login
NF12	All the claims are to be kept in the system for a maximum of 5* years	Security	O	All

*To be decided in accordance with the company. Note that a business can reclaim VAT on employee business expenses up to 4 years after the date of the expense [2].

[2] “Charge, reclaim and record VAT,” *GOV.UK*.
https://www.gov.uk/charge-reclaim-record-vat/reclaim-vat-business-expenses

2. Use-Case Diagram



3. Use-case Description

Name: Submit Claim

Brief Description:

Employees submit an expenditure claim. They must fill in all the required details depending on the type of the expense, attaching a VAT/receipt, before submitting the claim to be then forwarded to the employee's line manager for processing.

Actors: Employee (Internal Staff, Consultants, Line Manager)

Preconditions:

- Employee has an account registered to the system, created by the Admin
- Employee must be logged into the system

Basic Flow:

1. Employee opens the application to the main page
2. The “Claim Expenses” option is immediately available in display
3. The Employee chooses the appropriate Expense Claim Category from the ones available
4. The Employee fills all the mandatory required fields
5. The Employee adds a Proof of the Expense (VAT, receipt, booking confirmation, etc.); this enables the submission button
6. The Employee submits the claim and a prompt message is displayed

Alternate Flows:

Employee has not attached essential VAT/receipt documents during submission

6. File/information is missing, the system prompts the Employee to perform the operation again (submission is not possible until this step is complete)

Backend failure to store the information of the submitted claim

6. Error message is displayed informing the Employee to try again later

Post Conditions:

- The system automatically forwards the completed expenditure claim to the employee’s personal Line Manager for approval.

Name: Report Claim

Brief Description:

A Line Manager rejects an expenditure claim submitted by one of the Employees they oversee and files a report for the rejected claim.

Actors: Line Manager

Preconditions:

- Line Manager has an account registered to the system, created by the Admin
- Line Manager must be logged into the system

Basic Flow:

1. Line Manager navigates the pending claims list in the main page

2. Line Manager selects one of the pending claims in the queue to view and check the claim details

3. The Line Manager clicks on “Report claim”

4. The Line Manager is prompted to specify the Report motive, either “Suspected Fraudulent Claim” or “Incorrect Information”

5. The Line Manager has the option to further elaborate on the motive of the rejection

6. The Line Manager submits their response and a “Process successfully completed.” notification is displayed

Alternate Flows:

Backend failure to pull Expense Claim details

3. Error message is displayed informing the Line Manager of an error, and they can repeat the operation at a later time

Post Conditions:

- The claim is removed from the Line Manager’s pending claims list.
- The reported claim is forwarded as a report to the HR contact if the motive of rejection is “Suspected Fraudulent Claim” as a Report.
- The system notifies the Employee who submitted the claim of the outcome, changes the status of the claim and makes the appropriate changes on the Employee’s reliability score.

4. Risk Assessment

Risk	Likelihood	Severity	Impact	Preventative / Mitigating Actions
Poor time management	High	High	Unfinished product or delivery date	Have frequent progress evaluation meetings and adjust project plan accordingly
Team members are not productive	High	High	Delays in product delivery/ Rushed product	Suggest switching roles for some members. They may be more comfortable working on a different part of the project
Lack of communication	Medium	High	Inconsistent product	Have frequent meetings and communication to ensure all members are aware of each other’s progress.
Poor allocation of work	Medium	High	Some members left idle when they could be doing work	Try to divide the workload evenly across team members
Project scope is too ambitious	Medium	Medium	May lead to client dissatisfaction	Try to focus on core requirements/keep expectations reasonable
Progress meetings are missed	Medium	Low	Some team members may not be up-to-date with progress	Team members can communicate progress outside of meetings through multiple possible communication channels.
Requirements not fully developed	Low	High	Core features missing / not implemented before development	Try to refine requirements before the designing process. Talk with clients more.
Technology components aren’t stable	Low	High	Non-functioning components and longer development time	Perform thorough testing before moving on to other components

Breach of data	Low	High	Sensitive user data being leaked	Perform testing with fake data before trying with real data
Loss of data	Low	High	Unfinished product/major development costs	Have data backups on-site and off-site
Technology components aren't suitable	Low	Medium	Poorly functioning components and longer development time	Research appropriate technologies properly before development phase
Lack of version control	Low	Medium	Changes are not reversible	Consider using version control software like git. If not possible, then ensure that earlier versions are backed up
Not enough technical experience	Unknown	High	Challenges during implementation	Try to learn/experiment with different technologies and see what is feasible