Academic Year 2017-2018
M2 MIAGE IPM

CASE STUDY
Object-Oriented Design

Monitoring and Control of Information Technology Activities

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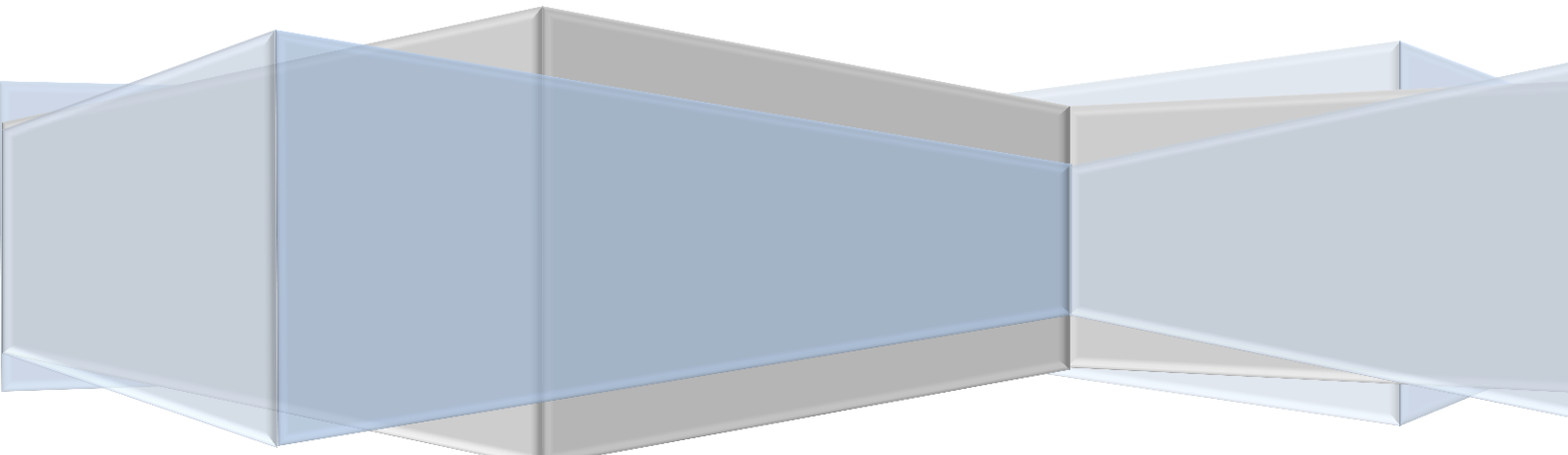

Summary

Content

SPECIFICATIONS

Management of the monitoring process of an IT project

1. INCEPTION

1.1 Iteration 0

System: Management of the monitoring process of IT interventions

Goals and Project challenge:

Our purpose is to design an application for the management of monitoring proces information projects of different departments in the company MEDIADIF. The manage and monitoring activities now in this company are manual, by creating this application, we transfer all these manual operations to automated operations. The main purpose is to normalize the informal activities. Moreover, these large amounts of data of different activities need to be stocked in a data base which could be consulted or queried by different actors. For example, the project manager can demand to read all of the interventions in the reports relate to his project ; the DED can demand to read all of the information project summaries of different departments; the directors of different departments can read the project summaries relate to his department.

Figures and key information:

- Small and Medium Enterprise company
- 230 employees
- 4 offices in France (Paris, Lyon, Rennes, Strasbourg)
- 8 people for the Engineering and Development sub-department
- 4 people for the Information System Management department
- 5 people for the Operations / Maintenance sub-department
- 9 people served as Project managers

Actors of the system to study:

- Director of the Engineering and Development (DED)
- Member of project
- Project manager
- Director of business unit

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List of scenarios by actor:

	Current	Future
Iteration1		
Project member	1. write WRITA ;	1. write WRITA ;
	2. correct or add information to WRITA ;	2. correct or add information to WRITA ;
	3. consult WRITA;	3. consult WRITA;
Iteration2		
Project manager	4. consult lines of WRITA;	4. consult lines of WRITA;
	5.check lines of WRITA	5.check lines of WRITA;
	6. write a summary of WRITA ;	6. write a summary of WRITA ;
	7. modify/continue writing the summary of WRITA;	7. modify/continue writing the summary of WRITA;
	8. consult summary;	8. consult summary;
Iteration3		
Director of Engineering and Development (DED)	8.consult summary	8.consult summary
Iteration4		
Business Unit Directors		8.consult summary

Critical assessment and needs

Critical assessment:

- Currently, the procedures are manual, rather cumbersome and excessively complex; the hardware and software architectures in place are quite varied and can be heterogeneous. There are too many actors involved and too much going back and forth.
- Everyone (project member, project manager, DED and department director) in the company have the same information, even the DED can see the activity reports of members, but in fact, he just need to see summaries of projects in order to make decisions.
- The process is not automated, the reports or summaries are passed from one to another by hand, and thus, the modifications cannot be registered for every copy. So, it's possible that someone cannot have the last version of the report.
- The reports and summaries cannot be consulted at any time.
- Moreover, the visibility of the reports is not adapted because if a project member has worked on various projects, each project manager will be able to see all the interventions done by the member. This translates to redundancy of useless information and might induce a loss of time or the project manager.

Requirements:

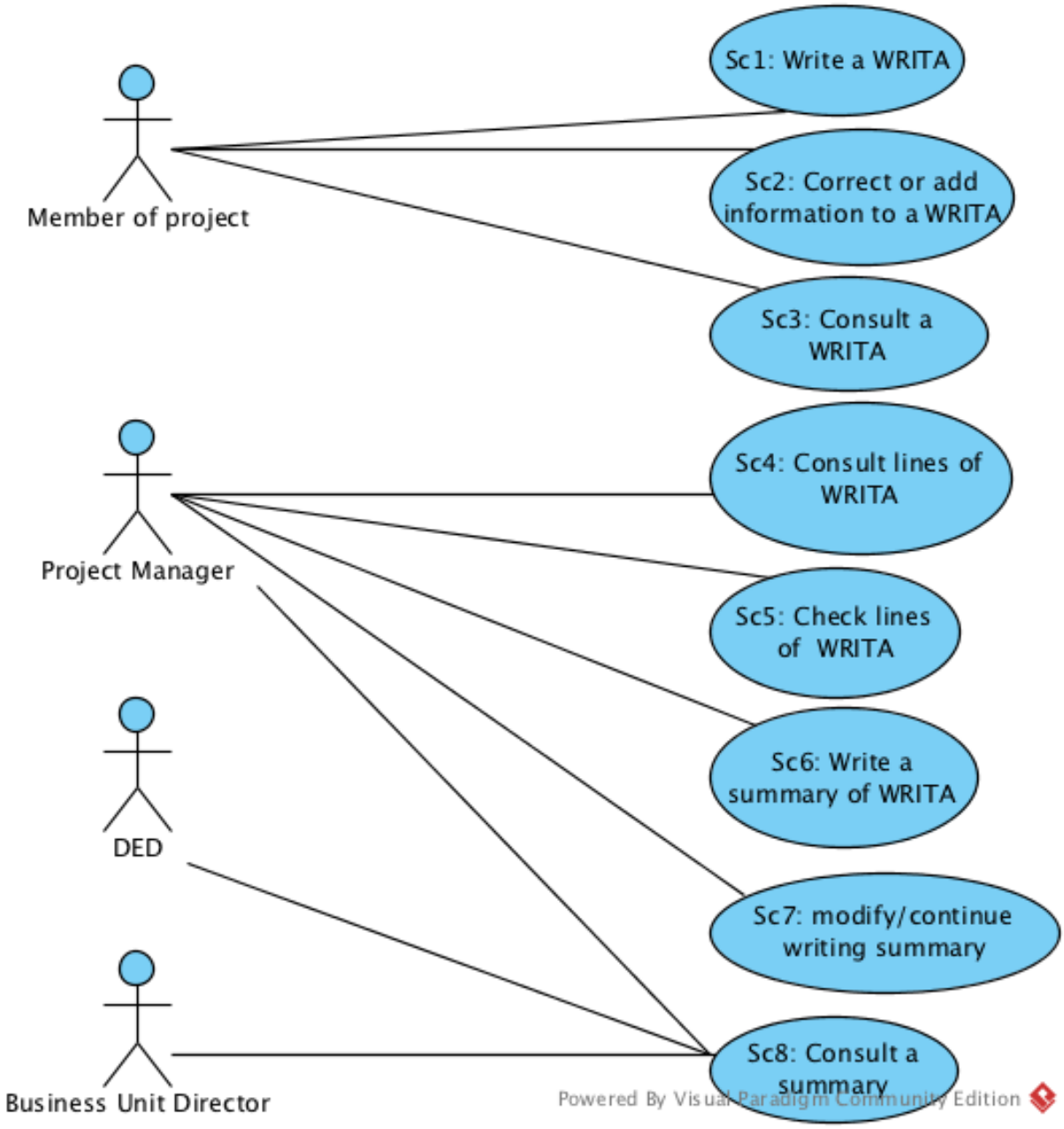
- Standardize the activity reports "Weekly Report of IT activities" (WRITA) and register them in the same data base.
- Different actors should have different information. We need to build different levels of details according to the type of actors related. The DED, for example, in order to make decisions, he just needs the summaries rather than the activity reports of project members. By doing so, we can eliminate the activities going back and forth.
- Automate and simplify the tracing of projects. Sending reports should be automated. It means that reports and summaries should be submitted to system rather than be given by hand. And all of the modifications should be registered in the data base and these modifications can lead to the update of reports and summaries.
- Improve the visibility of the DED for the projects. The application provides him not only the summaries but also some performing indicators or dashboards about projects.
- Project manager could only see the interventions relate to the project that he manages rather than all interventions in the activity reports of project members.
- The activity reports and summaries could be consulted at any time rather than be consulted only at the end of the week.

Assumptions:

- Connection: We assume that the application connection step is managed by a module already present in the application;
- Summary: The form is pre-filled with data seized by the different project members;
- Skill: A project member possesses a main skill;
- A project is initiated by a single service;
- Each Business Unit has only one director;
- A WRITA is considered valid when each line that composes it is validated;
- The application is accessible via a web browser;
- A project manager can only manage one project at a time.
- We assume that all the steps concerning the selection of an action in the home interface (access to a summary, access to a WRITA...) are done by using buttons.

1.2 Iteration 1

Iterations by actor and scenario list:

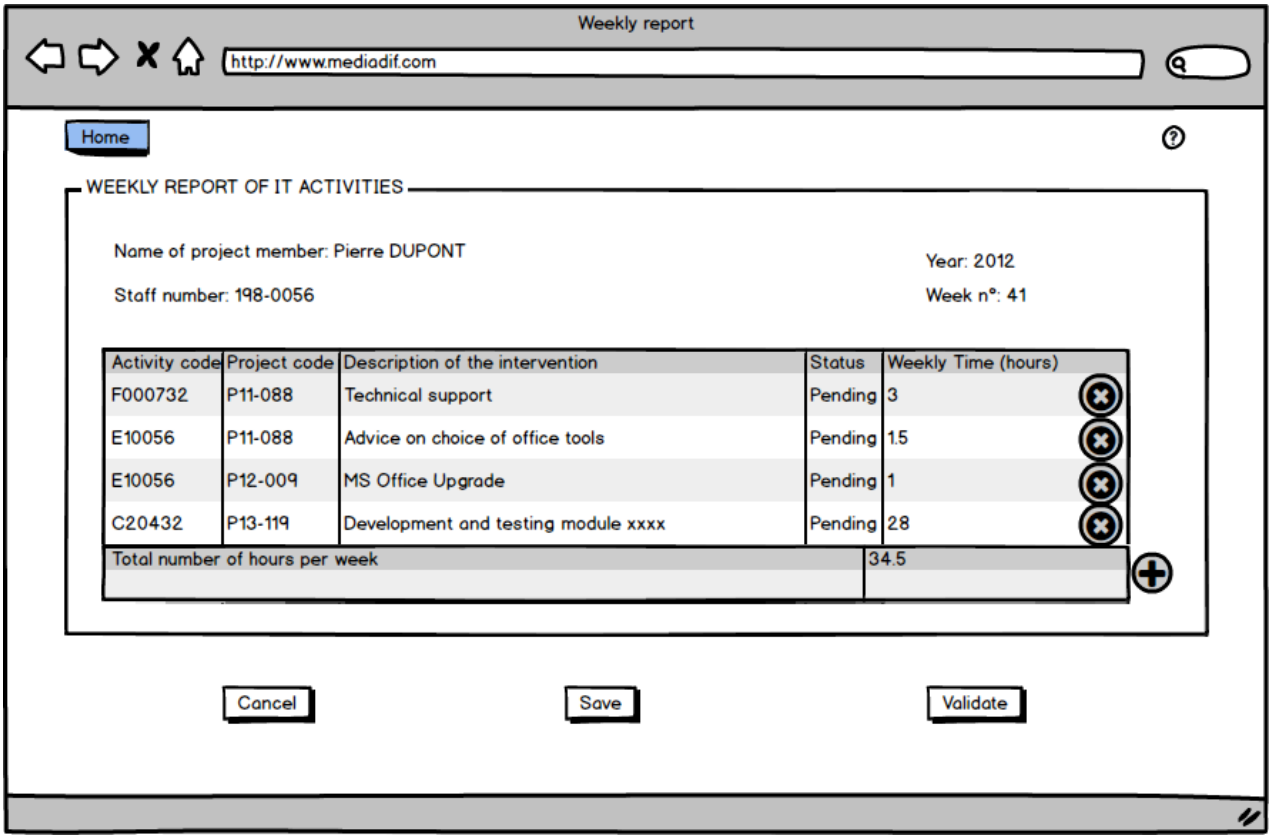


1) Iteration 1 – Project member:

Description of the scenarios:

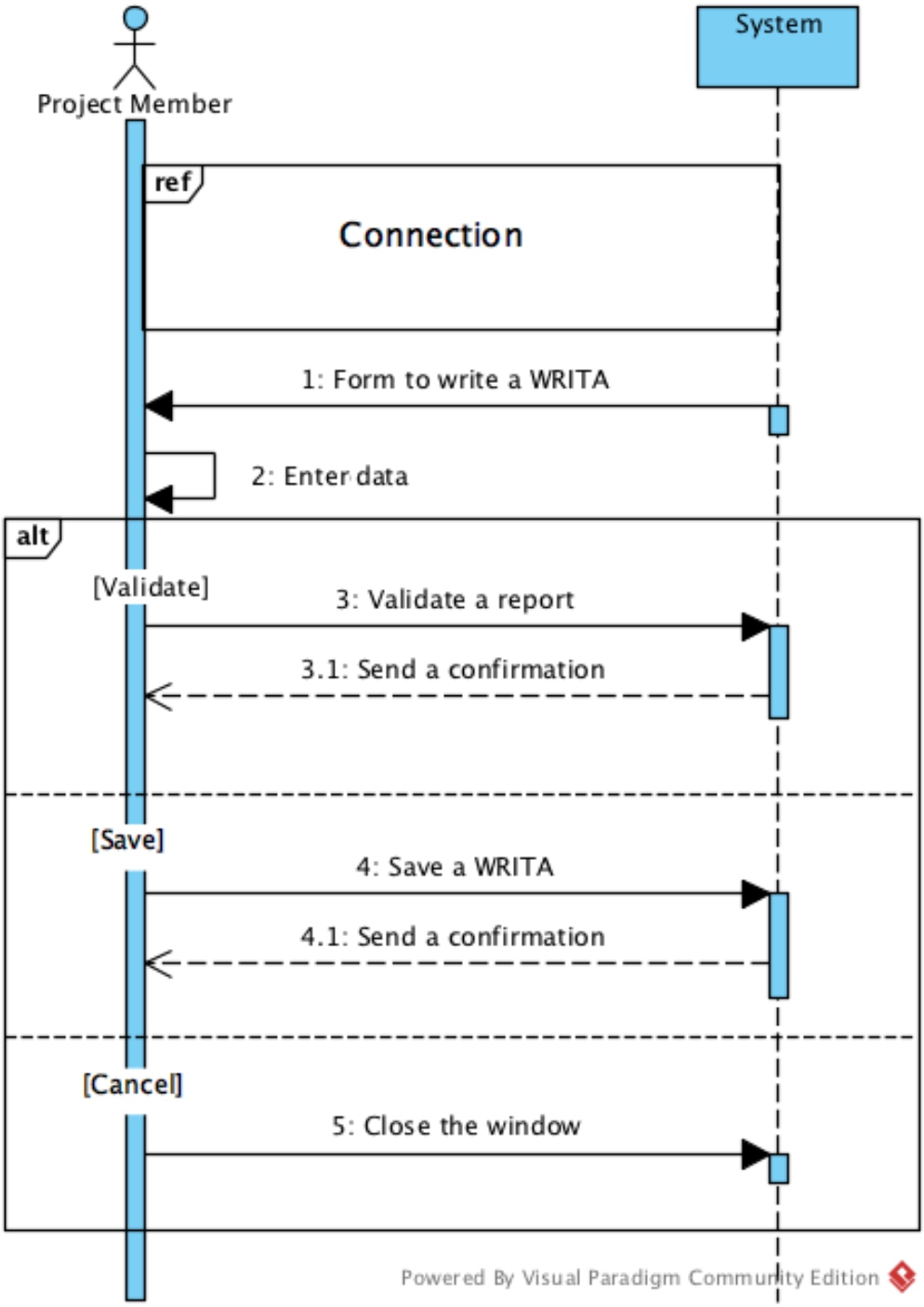
a) Scenario 1 « write a WRITA»:

- Model



Note: This is the model of « write a WRITA» by a project member. Through this interface, the project member will be able to see his name, his staff number, the year, the number of the week during the current year and a beforehand filled form, in which he will add the intervention he worked for.
To fill this form, the project member has to indicate the activity code, the project code, the weekly time and the description for each intervention he participated in. The total hours of work will be calculated by the system.
The member has the possibility to delete a row or add a new intervention thanks to 2 different buttons.
After filling all the information, he can validate the WRITA, which means that the WRITA will be sent to the project manager or he can also save this WRITA for a potential modification; or finally cancel the operation to write a new one.

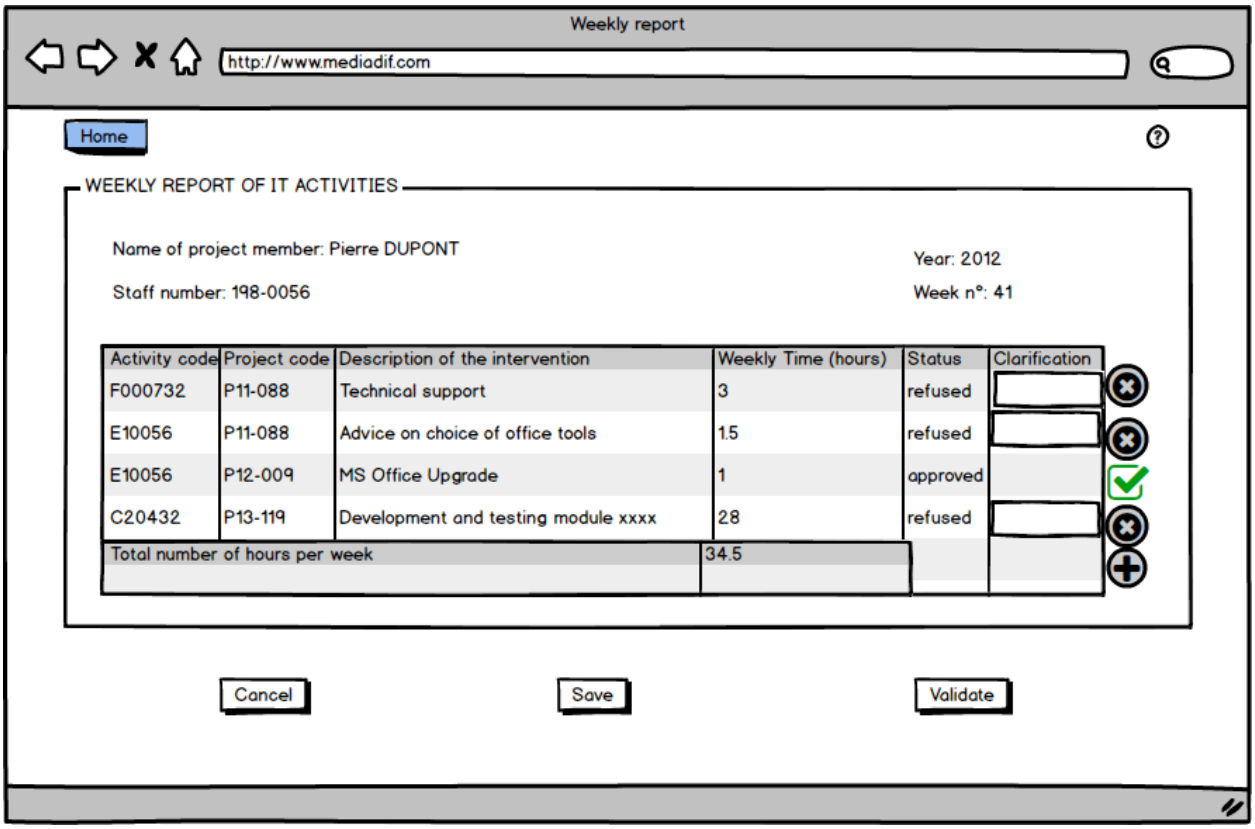
System Sequence Diagram



After the connection, the user gets a form from the system,he has to fill it with data concerning interventions of activities he carried out described before. Then he can validate the WRITA, which means that the WRITA will be sent to the project manager or he can also save this WRITA for a potential modification later; or finally cancel the operation to write a new one.

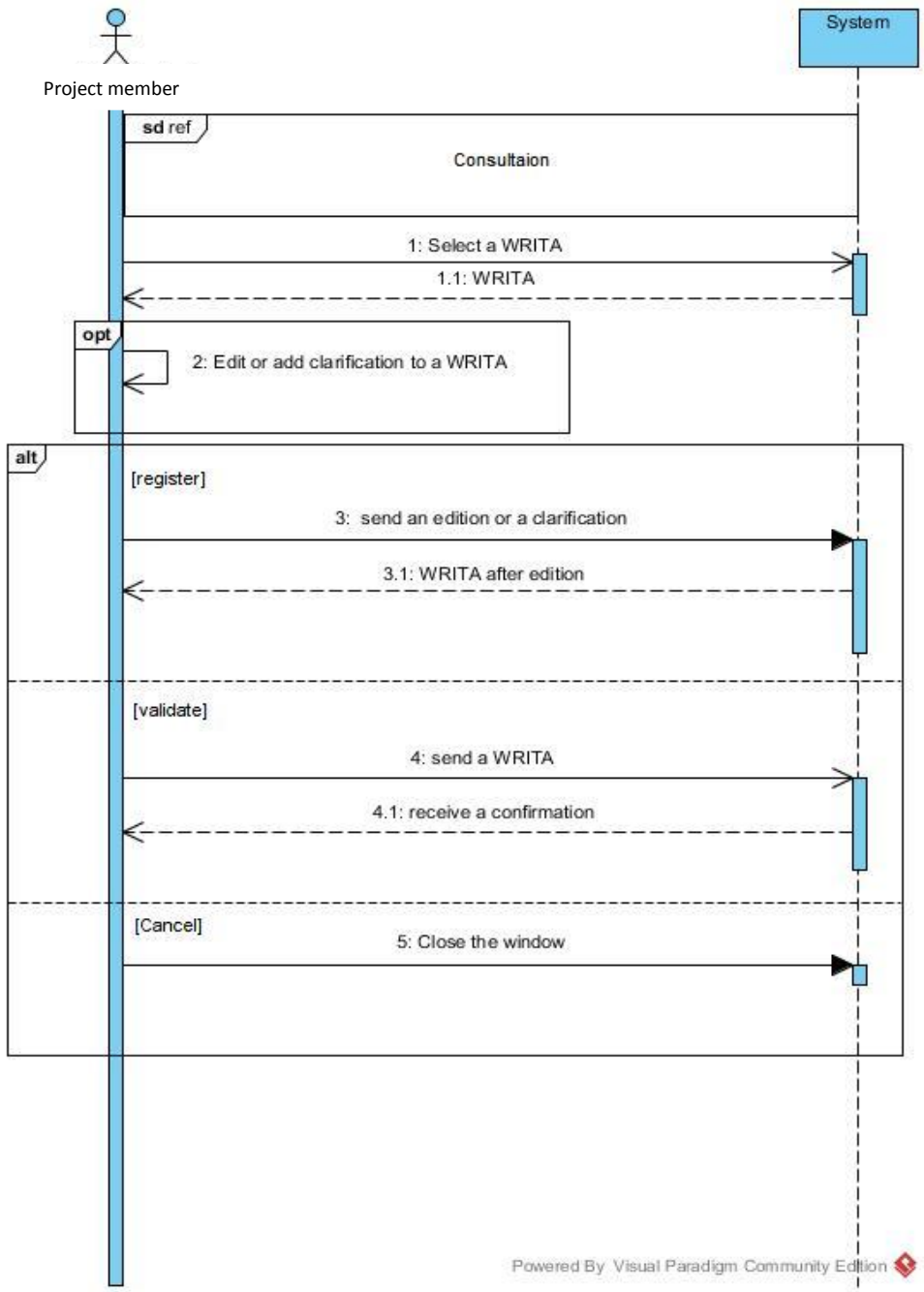
b) Scenario 2 « correct or add information to WRITA »:

Model



Note: This is a model of « correct or add information to WRITA » for a project member. He can see the status of each intervention in the selected WRITA.
If an intervention is refused by the project manager, it means he has to modify this intervention.
The project member can directly modify information of each line in the form or delete the line and then add a new intervention. He can also add a clarification for this intervention.
If an intervention is approved by the project manager, he can't modify it anymore. After modification, he can click register, validate or cancel button, the functions of these buttons are just like the previous scenario.

System Sequence Diagram

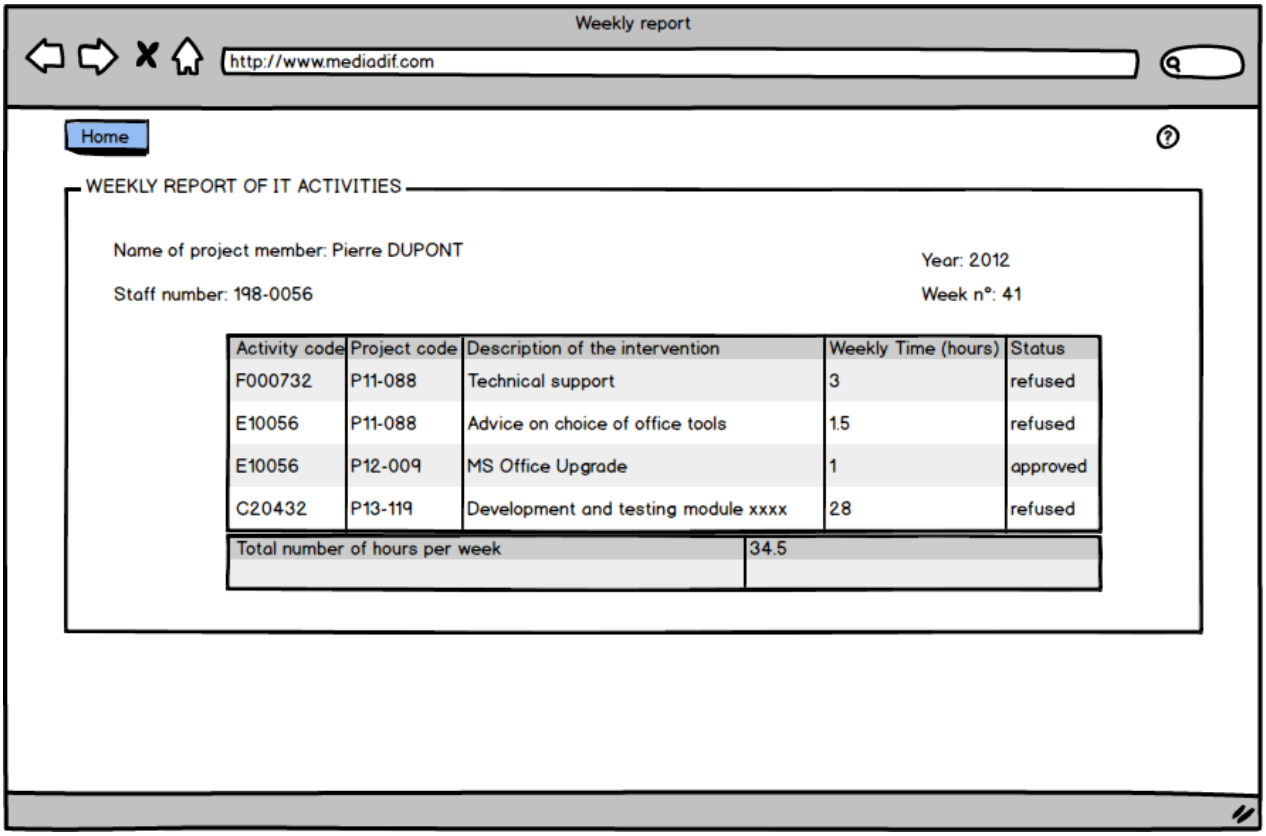


The project member first selects a WRITA then the system displays the selected one. The user modifies his WRITA if necessary and then has three possibilities to end the process. He can save the WRITA, if so, the system will save all the data and displays the new WRITA to the user.

The user can validate his WRITA which means it will be sent to the project manager. Finally, he can cancel the modifications and the WRITA will remain as it is.

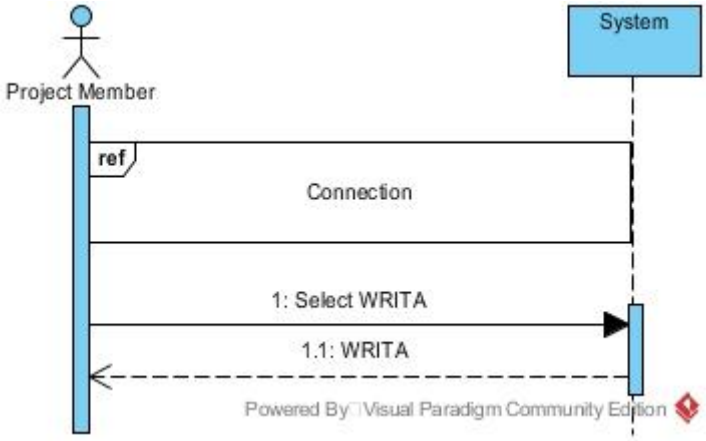
c) Scenario 3 « consult a WRITA »:

- Model



Note: These are models of « consult a WRITA » by a project member. First of all, he connects to the system; he will see a list of WRITA that he had written, he could choose one of them and click the button SHOW. Then a second interface will show the details of this WRITA, which include the status and the clarifications.

System Sequence Diagram



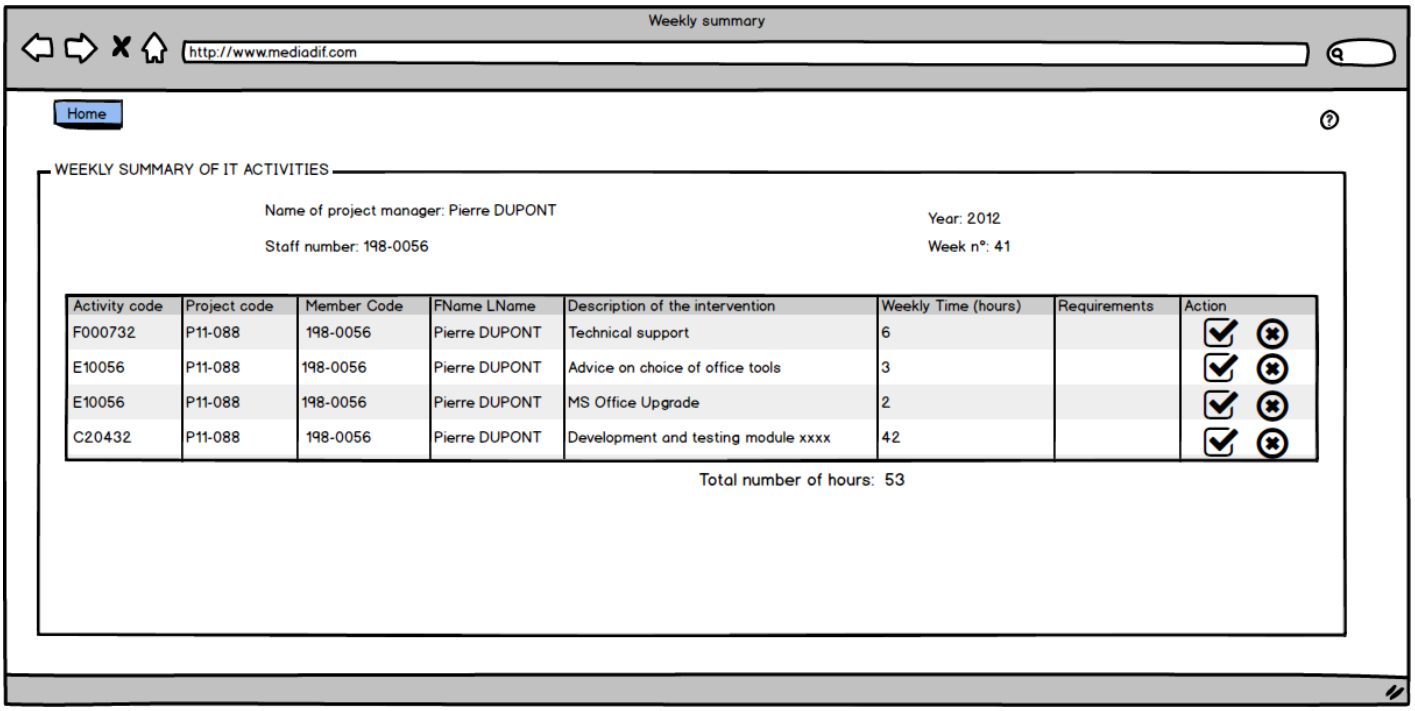
After connecting to the application, the project member will be able to select a WRITA and the system will display the selected one.

Use Case Diagram Iteration1:

2) Iteration 2 – Project Manager:

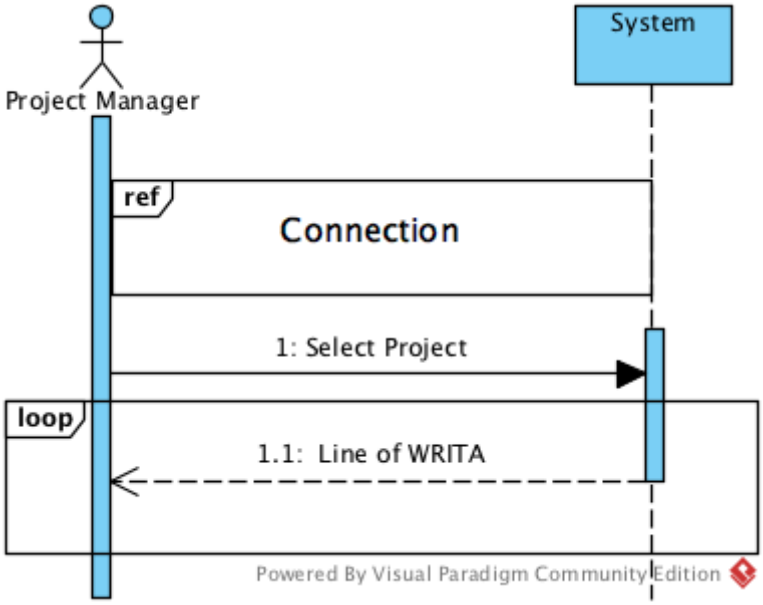
a) Scenario 4 « consult lines of WRITA»

- Model



With this application, a project manager will be able to consult all the interventions related to the project he is working on. In fact, the application will display all the lines of WRITAs written by all the members working on the same project based on the project's code.
We decided to give more data than the current model established because our application will delete the transmission of the paper version of WRITA. That is why the code, the first name and last name will be displayed.
Furthermore, there will be buttons that will allow the project manager to validate or ask for a clarification about a line of WRITA.

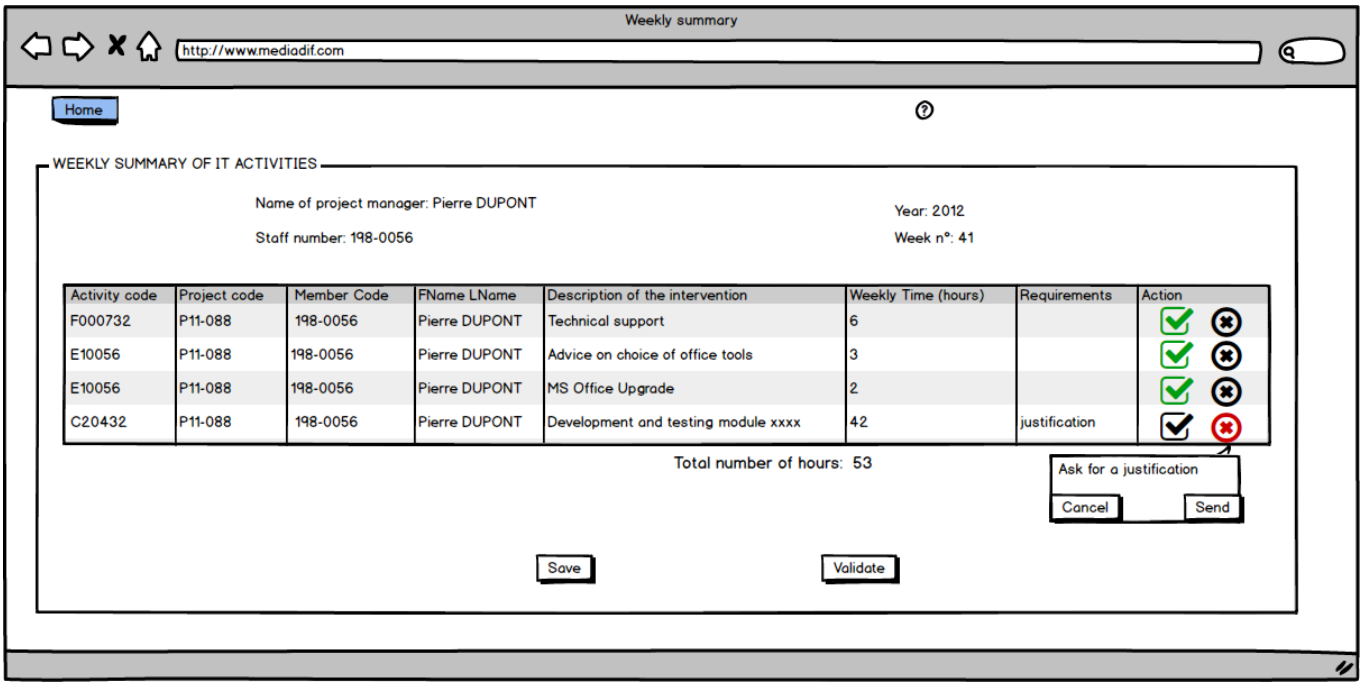
System Sequence Diagram



Once the user is connected to the system, he will select a project and the system will display all the lines of WRITA that are related to the project.

b) Scenario 5 « check lines of WRITA»

- Model



With this application, a project manager will be able to consult all the interventions related to the project he is working on. In fact, the application will display all the lines of WRITAs written by all the members working on the same project based on the project's code.
We decided to give more data than the current model established because our application will delete the transmission of the paper version of WRITA. That is why the code, the first name and last name will be displayed.
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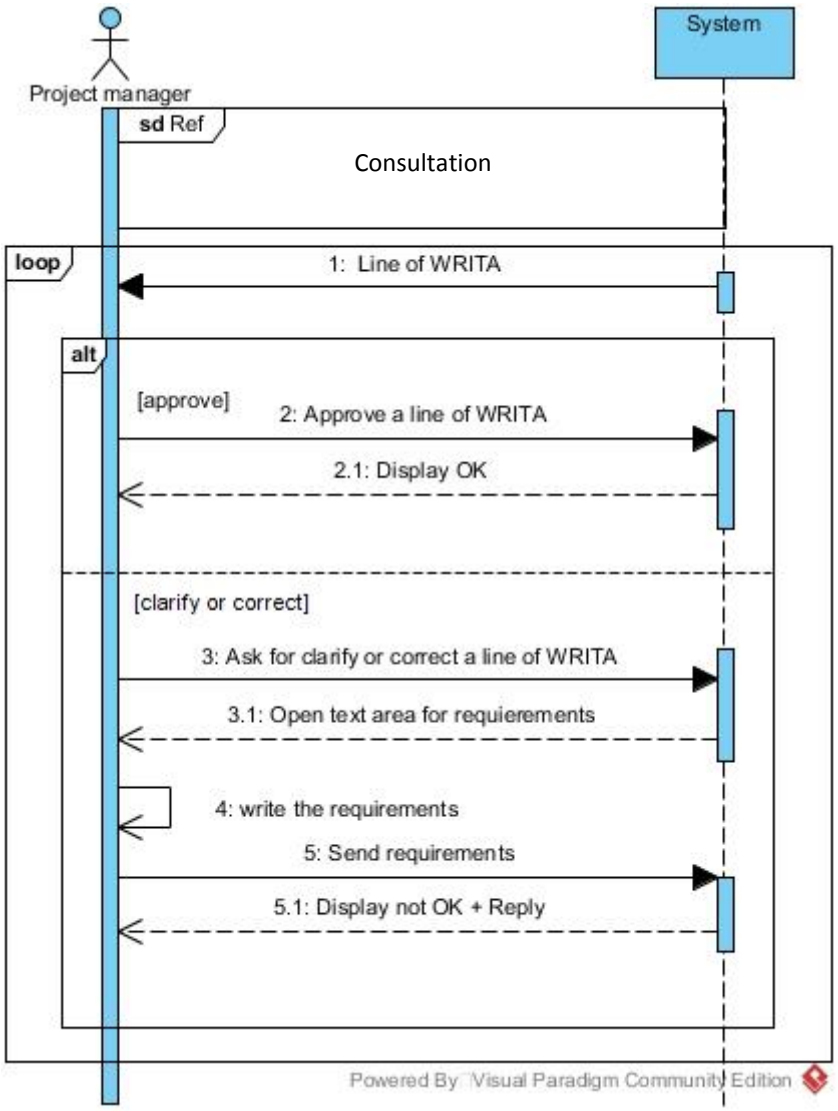
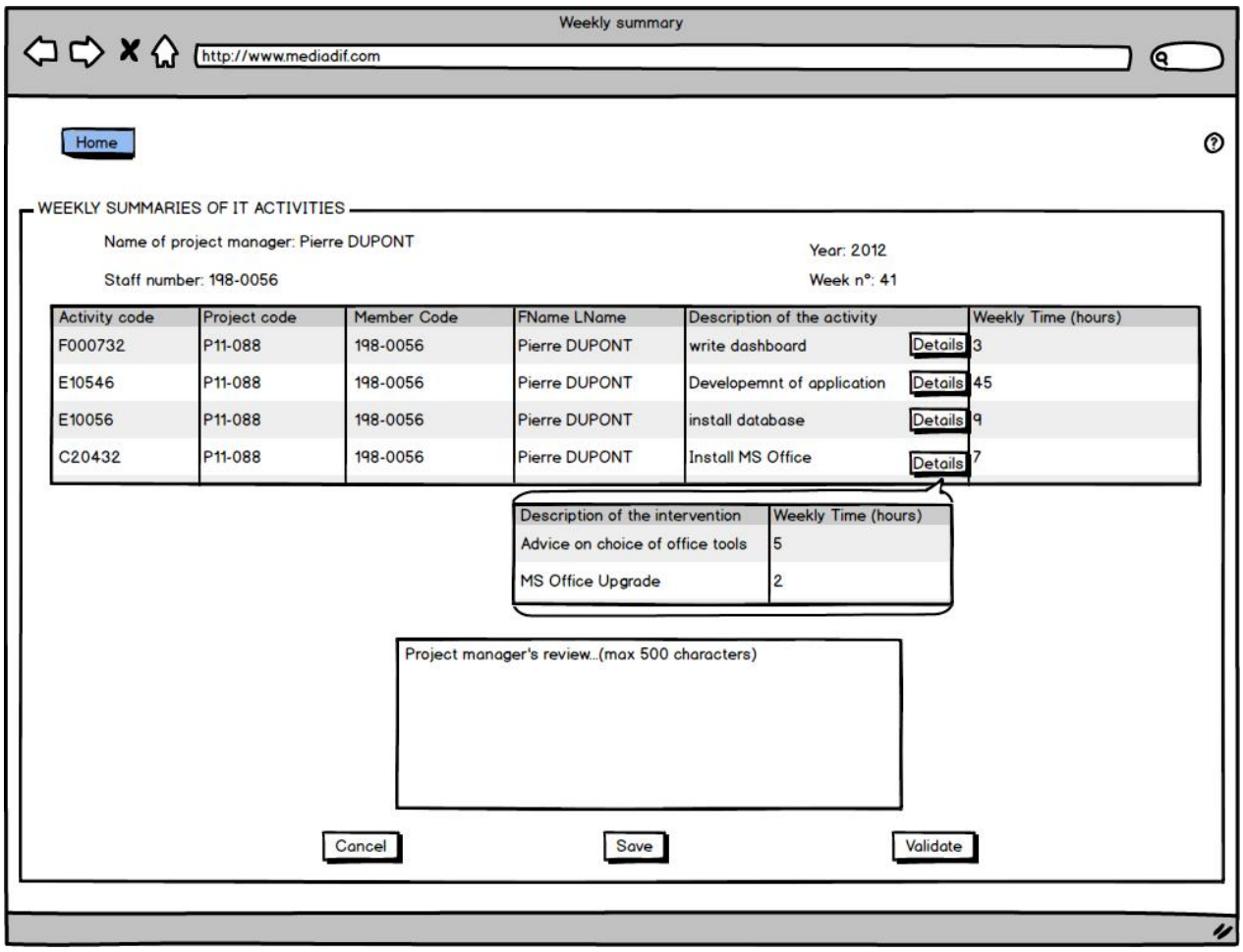
System Sequence Diagram



When the project manager has selected the project he wants the lines of WRITA, the system displays all of them and for each one he can approve it or ask for a clarification. If so, the system will open a small text area where he will be able to send the reasons why he refused to approve the line of WRITA. Then he will validate and it will be sent to the system which will display a reply.

c) Scenario 6 « write a summary of WRITA»:

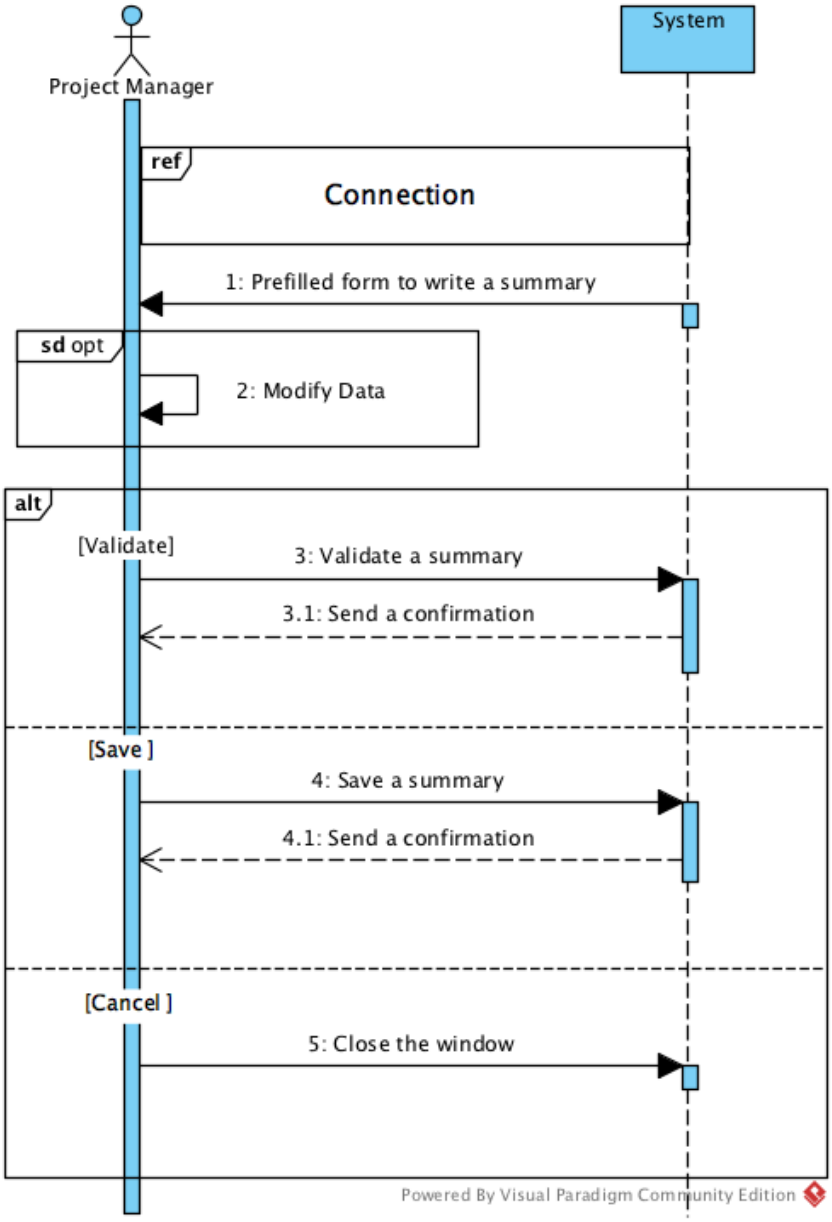
- Model



Note: This is a model of « write a summary of WRITA» for a project manager.
The project manager will see all the approved activity automatically generated by the system. Each line represents an activity, if he wants to see the interventions of an activity; he has to click the “Details” button. If the user clicks on the “Details” button, a small pop-up will open to show precisely each intervention lead for the related activity.
Before publishing, the project manager can add a review of the week to add information about the progress of the project for the DED or the Business Unit Directors.

Finally, just like previous interfaces, there are 3 buttons, the one that cancels the process, the one that allows the user to save the summary and not send it and the “validate” one that will publish the summary.

System Sequence Diagram

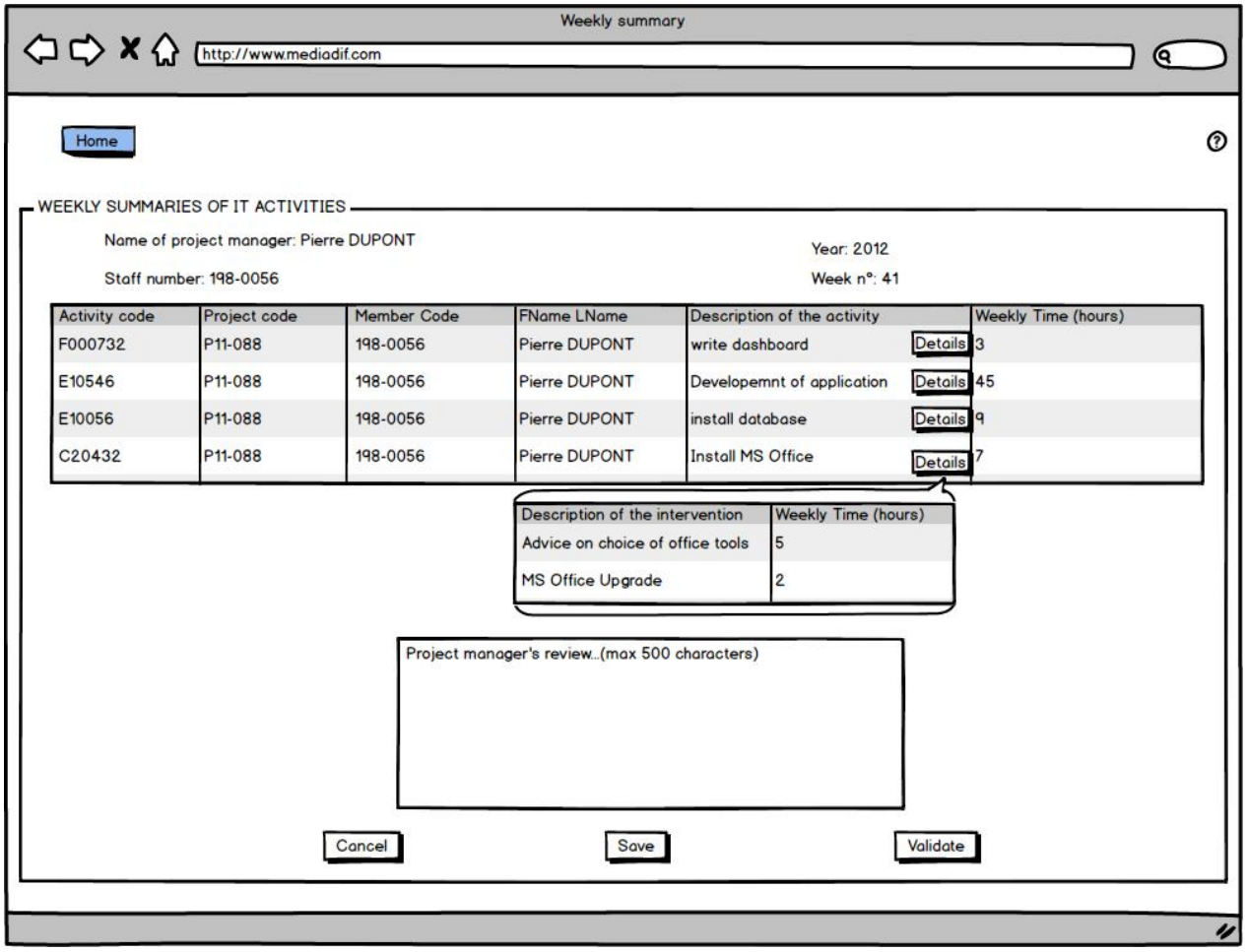


After the connection, the project manager will be able to get a form to create a summary from all the lines of WRITA he can have. If he has modifications to do or add an assessment, he can do so with the text area provided for this purpose.

Finally, he has 3 alternatives:
He can validate his summary, and then the system will send a publication confirmation;
He can save his summary, and then the system will send a backup confirmation;
He can cancel, it will close the window.

d) Scenario 7 « modify/continue writing the summary of WRITA »

- Model



This is the exact same interface as the previous one because we think that the user doesn't need another interface for the same purpose.

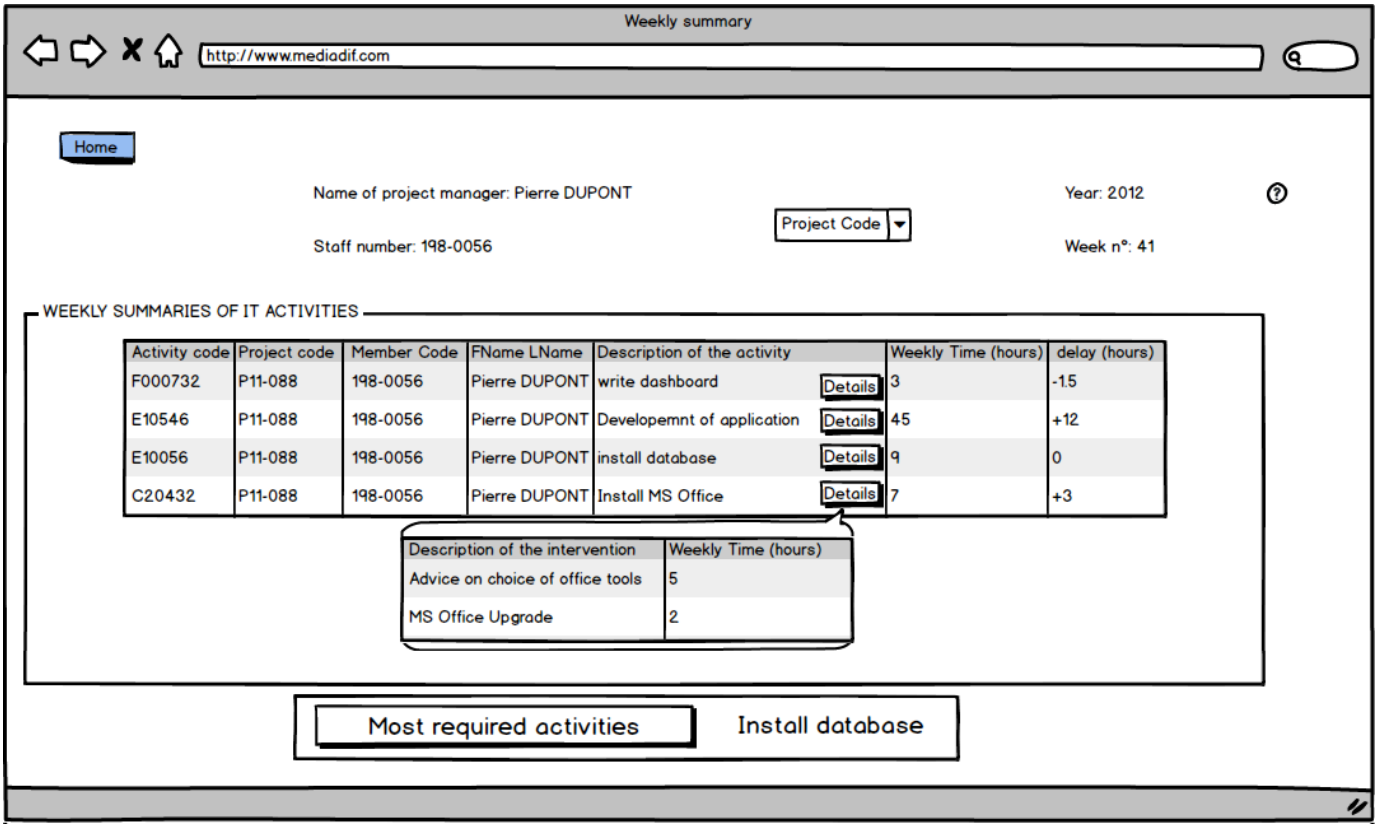
The project manager will see all the approved activity automatically generated by the system. Each line represents an activity, if he wants to see the interventions of an activity, he has to click the "Details" button. If the user clicks on the "Details" button, a small pop-up will open to show precisely each intervention lead for the related activity.

Furthermore, if the status is "sent", he cannot modify anymore; if the status is "saved", he could modify his opinions and add new clarifications.

Before publishing, the project manager can add a review of the week to add information about the progress of the project for the DED or the Business Unit Directors.

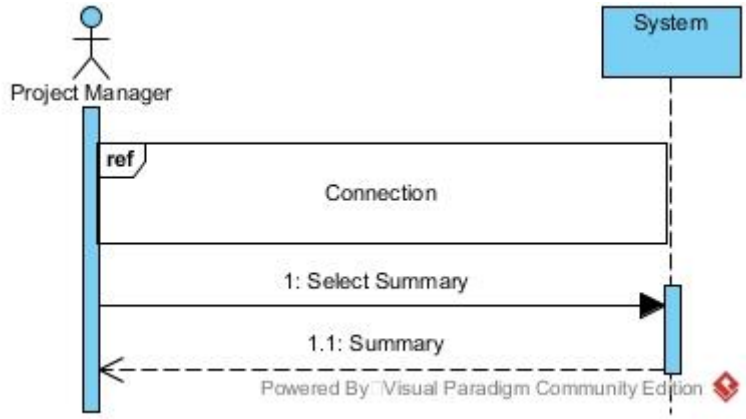
e) Scenario 8 « consult summary »

- Model



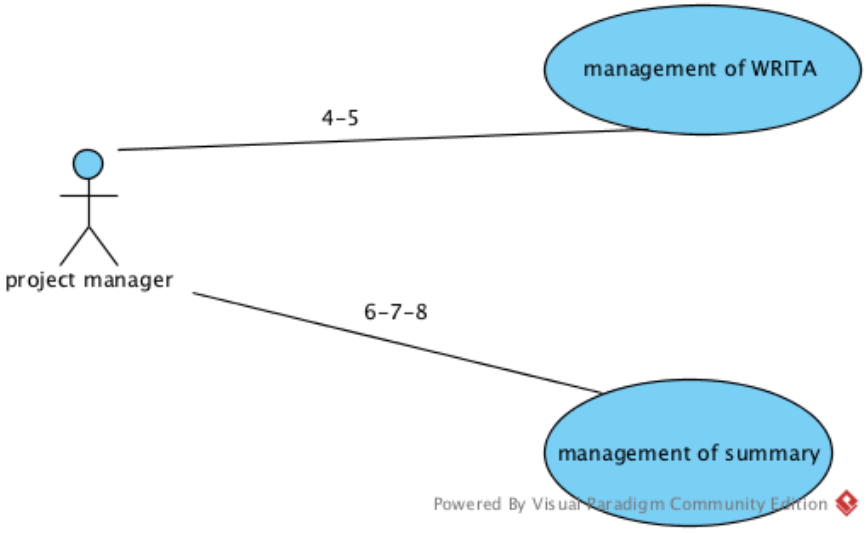
Note: Once the project manager has chosen the summary he wants to study, he reaches this screen which contains lines of activities that are carried out during the project. The manager can click the “Details” button to see all the interventions associated to one activity.
As the old version, the user can see the total time worked for an activity.
We added the delay that reflects the difference between the time carried out and the time expected.
Finally, the application shows which activity is the most required for the project where the manager is involved in.

System Sequence Diagram



Once logged in, the user arrives on the summary selection interface, he only has to choose a summary and the system will display it.

Use Case Diagram Iteration 2:

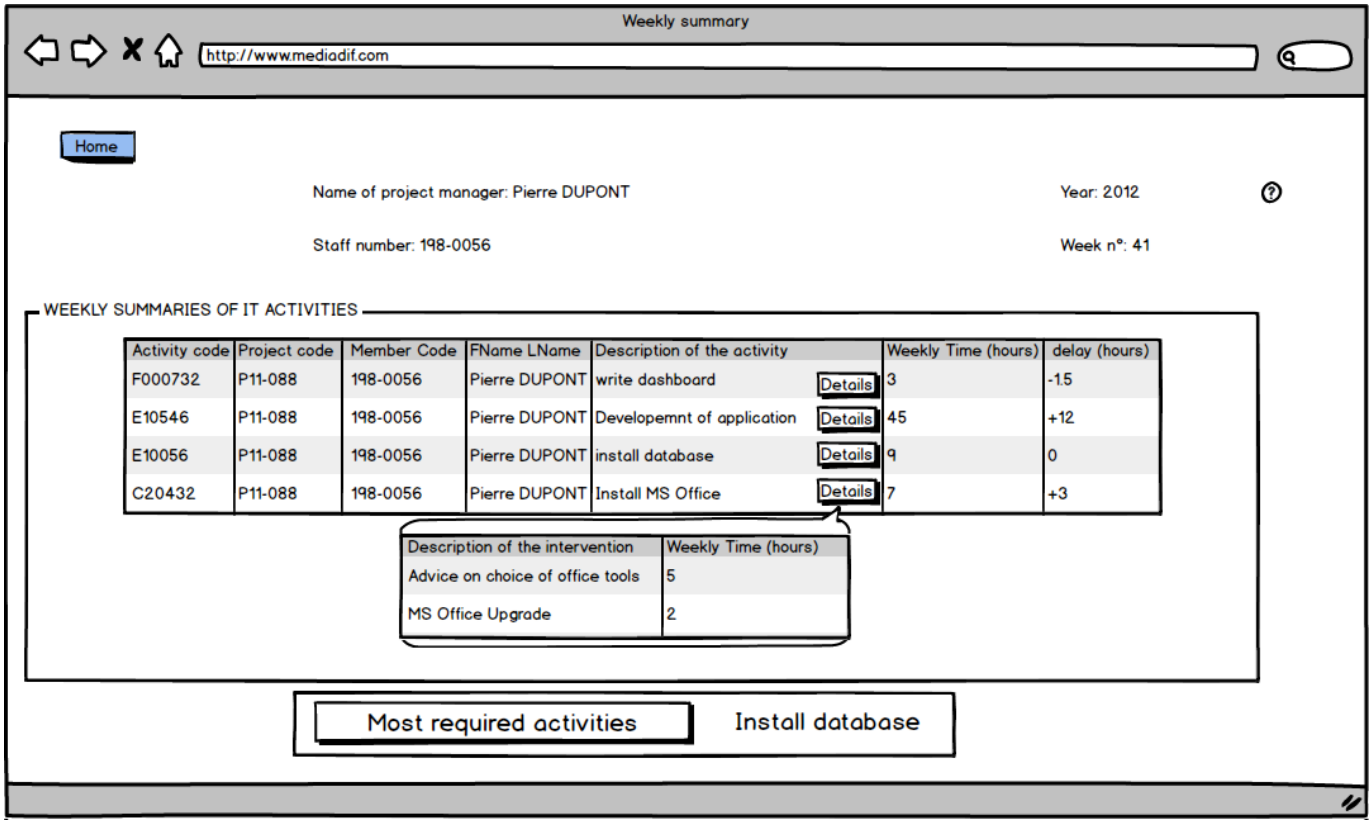


3) Iteration 3 – Director of Engineering and Development (DED):

Description of the scenario:

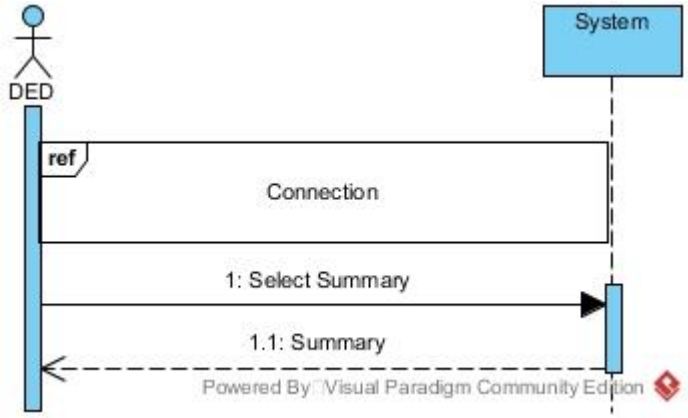
a) Scenario 8 « consult summary »

- Model



Note: Once the DED has chosen the summary he wants to study, he reaches this screen which contains lines of activities that are carried out during the project. The manager can click the “Details” button to see all the interventions associated to one activity.
As the old version, the user can see the total time worked for an activity.
We added the delay that reflects the difference between the time carried out and the time expected.
Finally, the application shows which activity is the most required for the project where the manager is involved in.

System Sequence Diagram



Once the DED is connected, he has to select a summary and the system will display it.

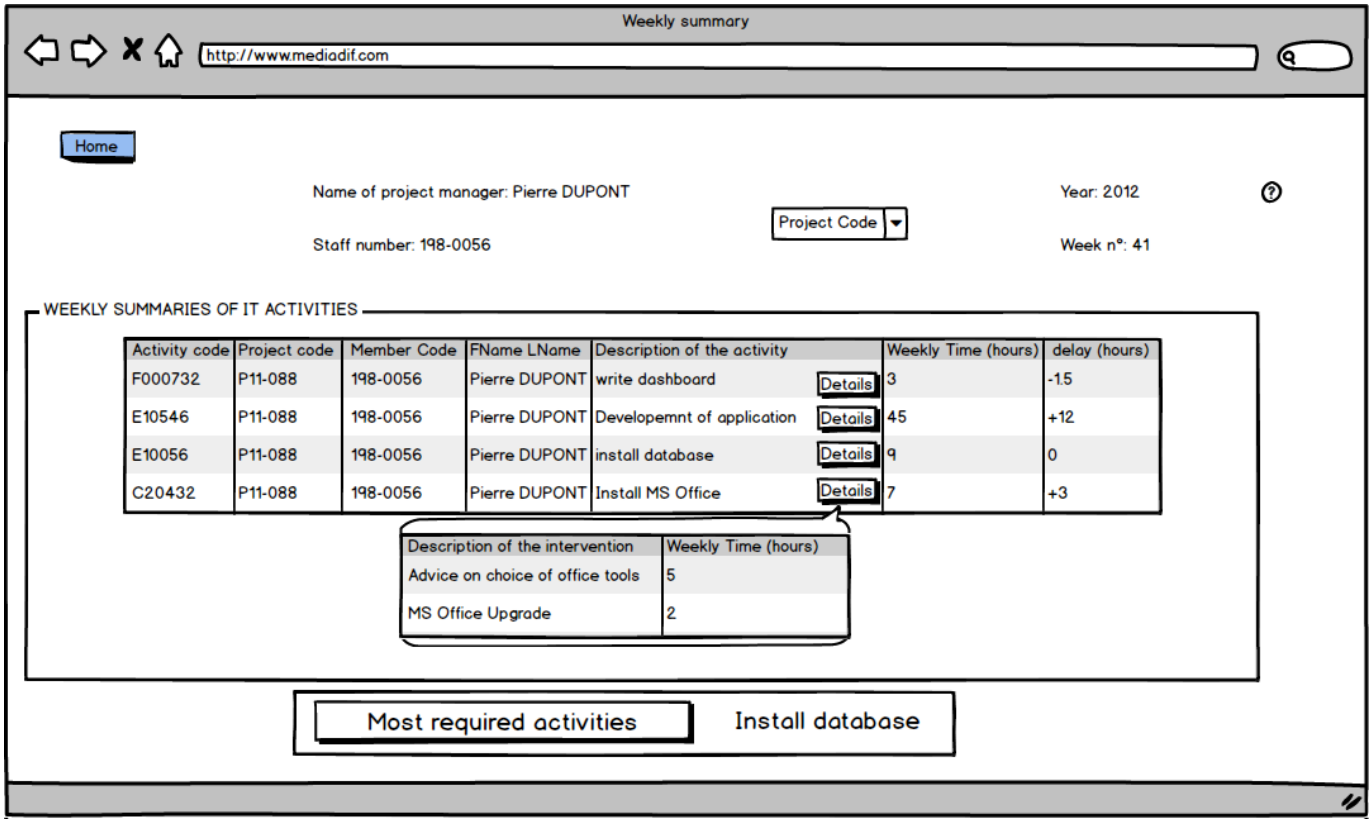
Use Case Diagram Iteration 3:

4) Iteration 4 – Business Unit Director (BU Director):

Description of the scenario:

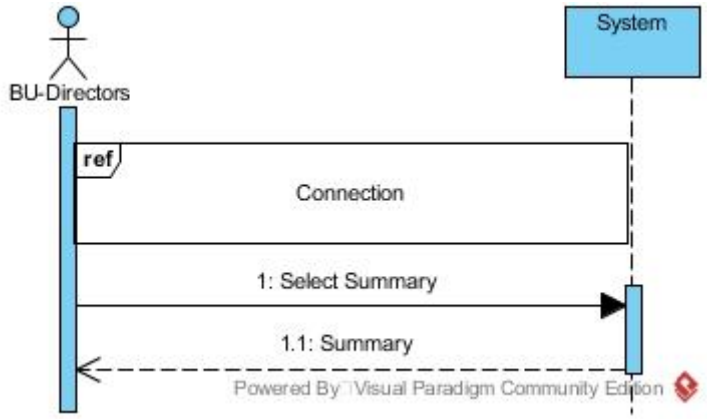
Scenario 8 « Consult a summary »

- Model



Note: Once the Business Unit Director has chosen the summary he wants to study, he reaches this screen which contains lines of activities that are carried out during the project. The manager can click the “Details” button to see all the interventions associated to one activity.
As the old version, the user can see the total time worked for an activity.
We added the delay that reflects the difference between the time carried out and the time expected.

System Sequence Diagram



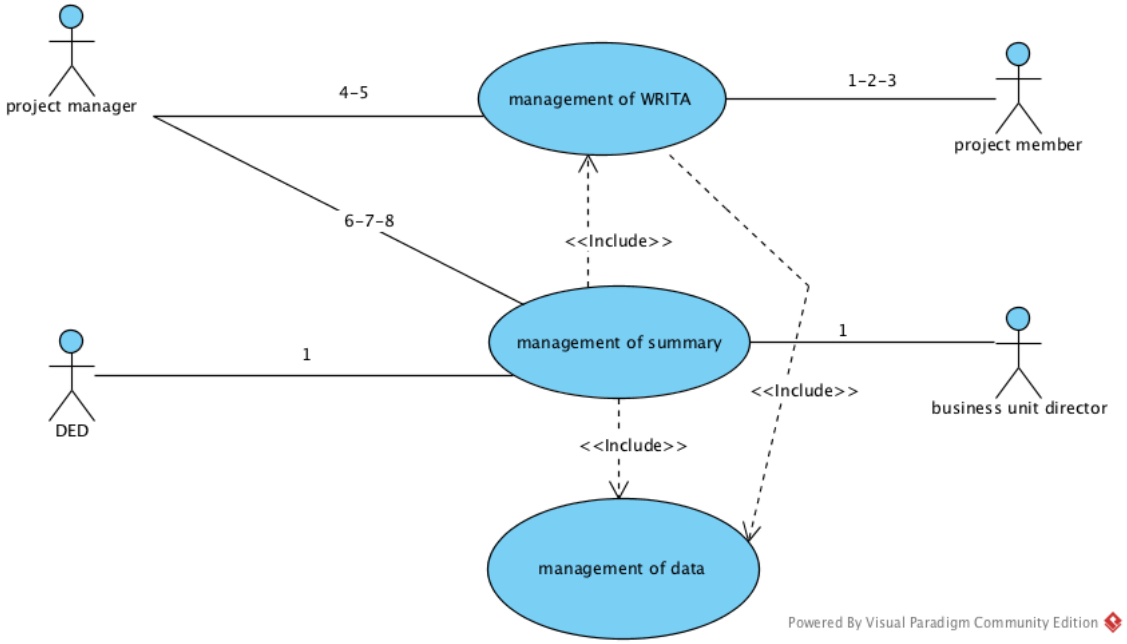
Once the Business Unit Director is connected, he has to select a summary and the system will display it.

Use Case Diagram Iteration 4:

5) Iteration 5: Integration and validation of the global Use Case Diagram

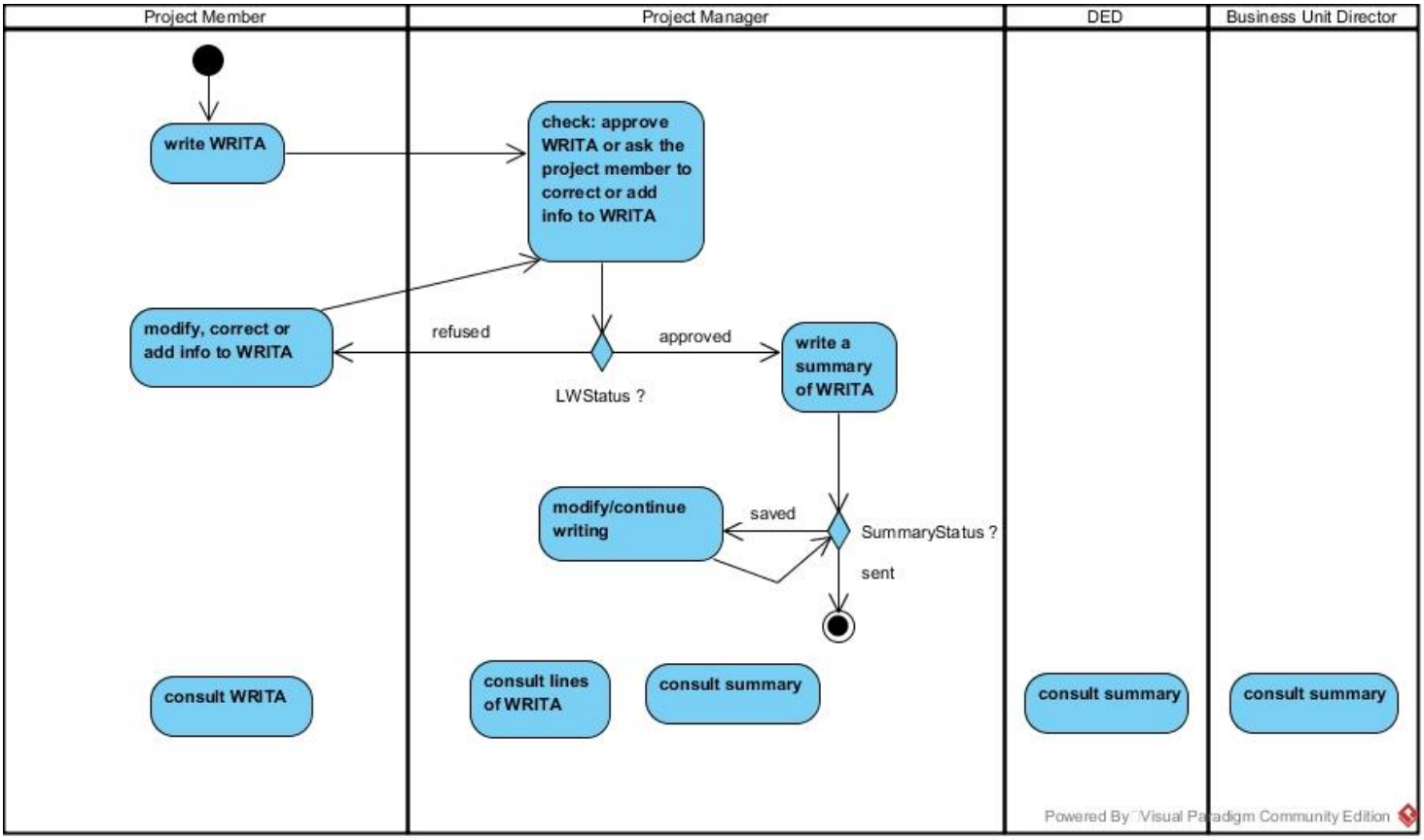
Global Use Case Diagram:

This is the global use case diagram of the system “management of the monitoring process of IT interventions”:



Functional swim lane:

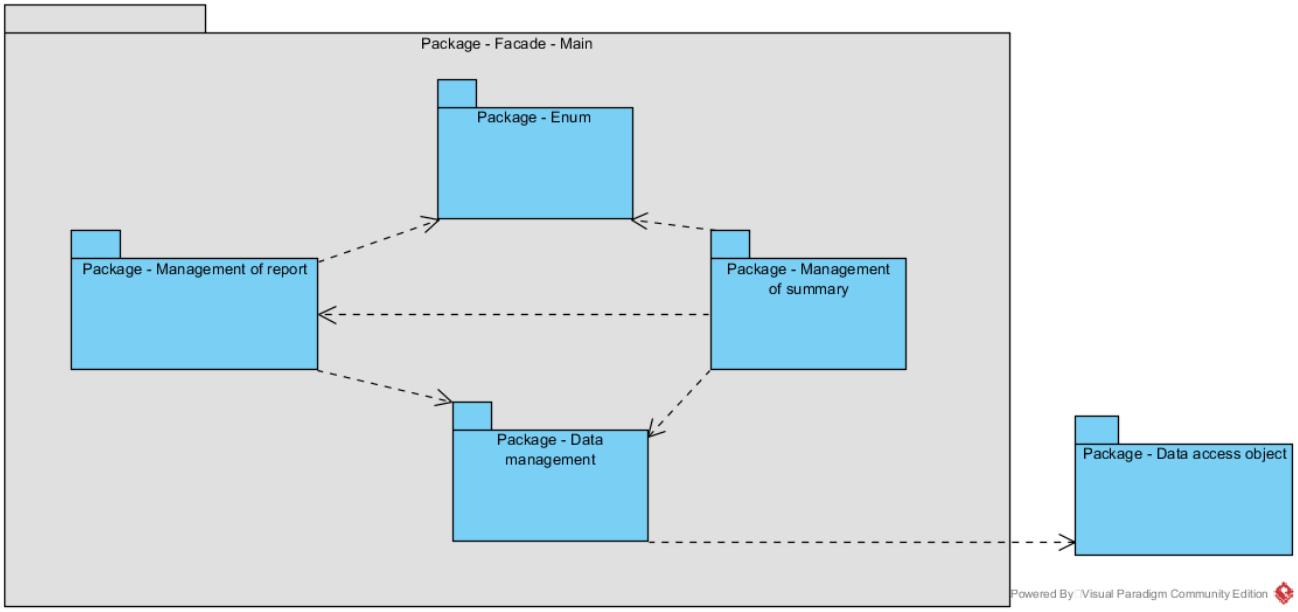
This functional swim lane describes the exchanges between the actors who interact with the system of “management of the monitoring process of IT interventions”.



2.Development phase

Iteration 0: Synthesis of the inception phase and planning for the elaboration phase

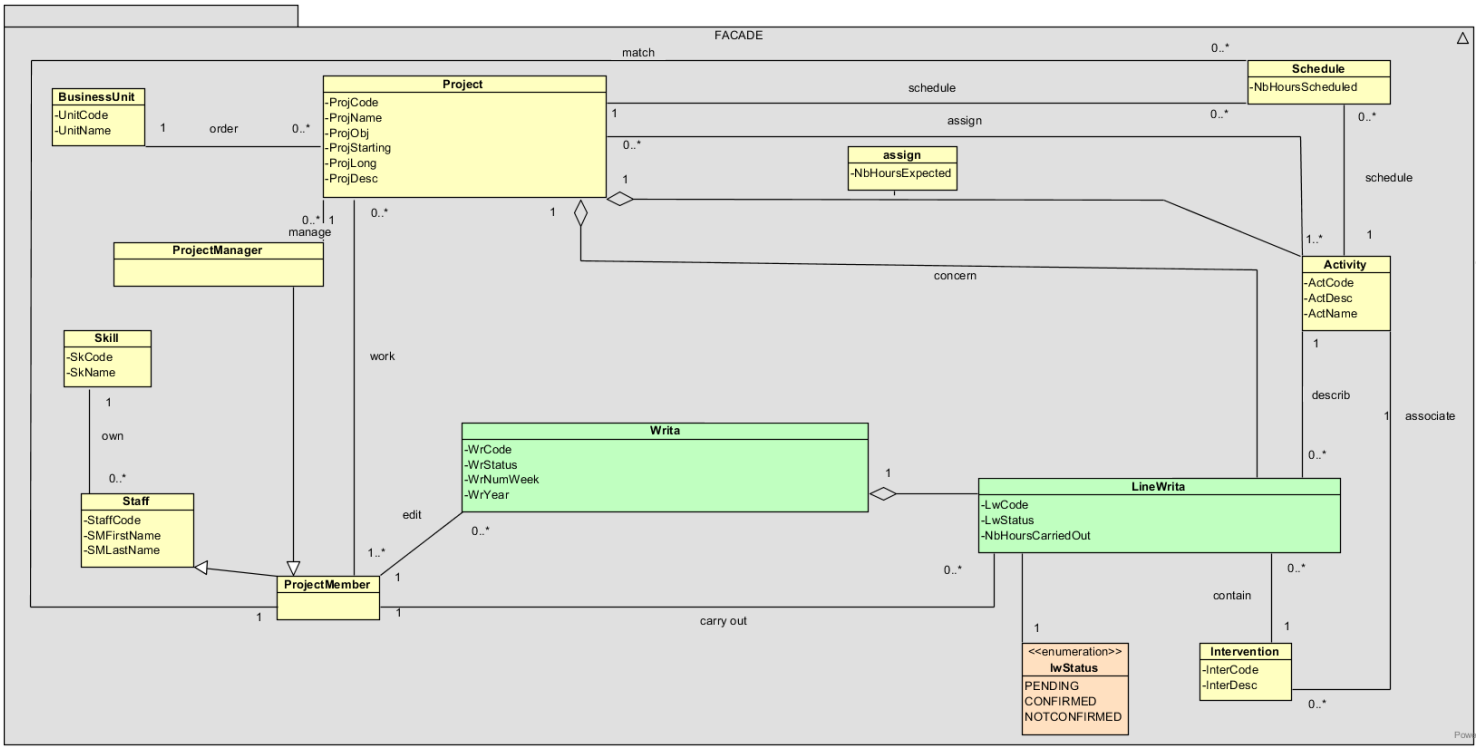
Logical architecture (packages)



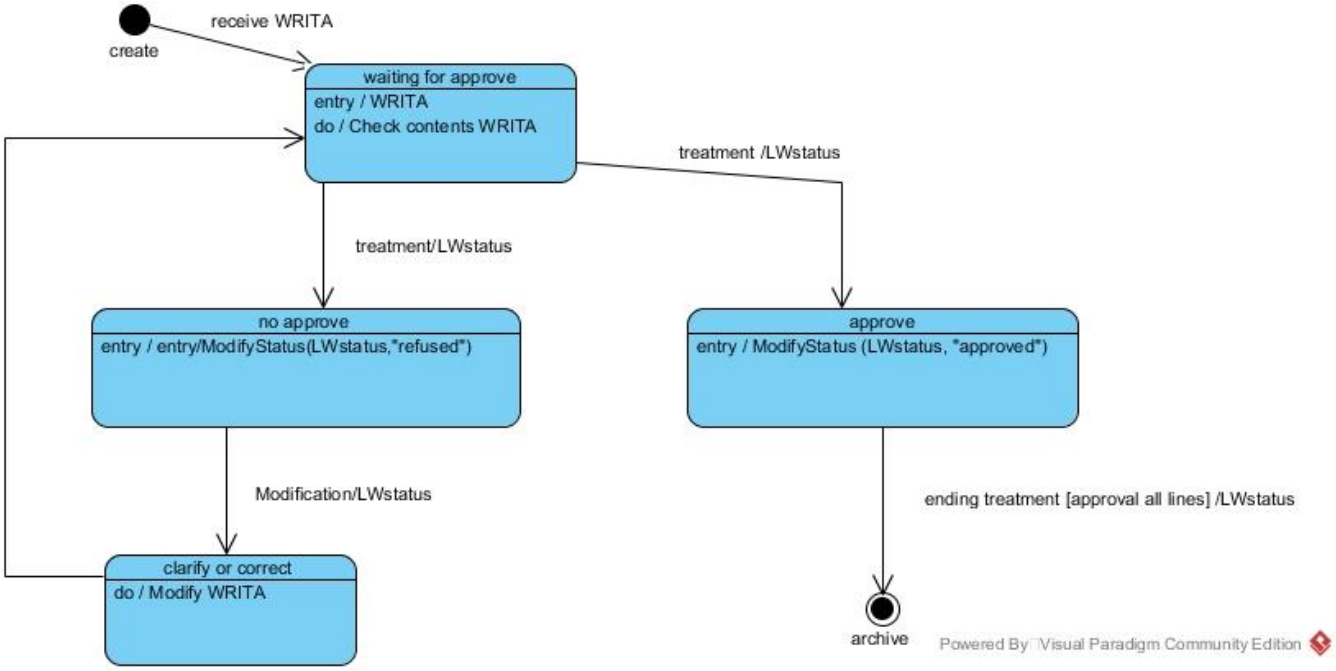
This is the logical architecture of the packages. We have 5 packages, we assume that the 3 following packages : “Data access object, Data Management, Enum” are managed thanks to the application. We will only implement the management of report and the management of summary.

2.1 Package (Use Case) Management of report

Partial "static" class diagram:

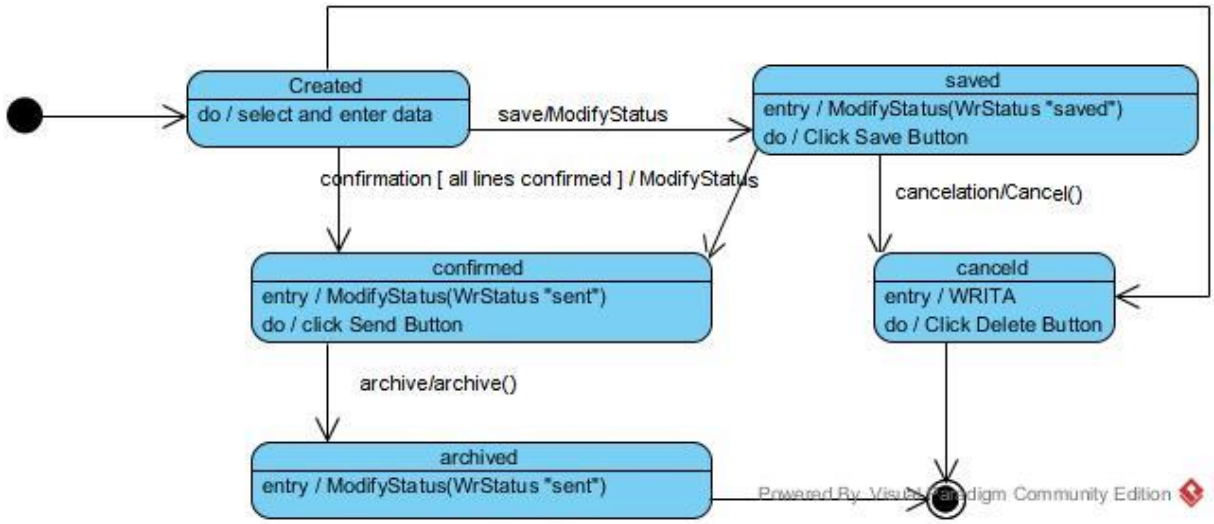


State chart Diagram: Status of a line of WRITA



This diagram shows how to modify the status of a WRITA.
First, when the project manager receives the WRITAs, the status of the WRITA is set to “waiting for approve”. Then, when the manager has finished the check contents of a WRITA, he has two options:
- he can approve the WRITA that means the status of WRITA will be updated to “approve”, archived and published for the other users.
- he can refused the WRITA the status will remain as “refused” and the WRITA will be asked for modify (clarify or correct) that means the WRITA will come back to the status “waiting for approve”.

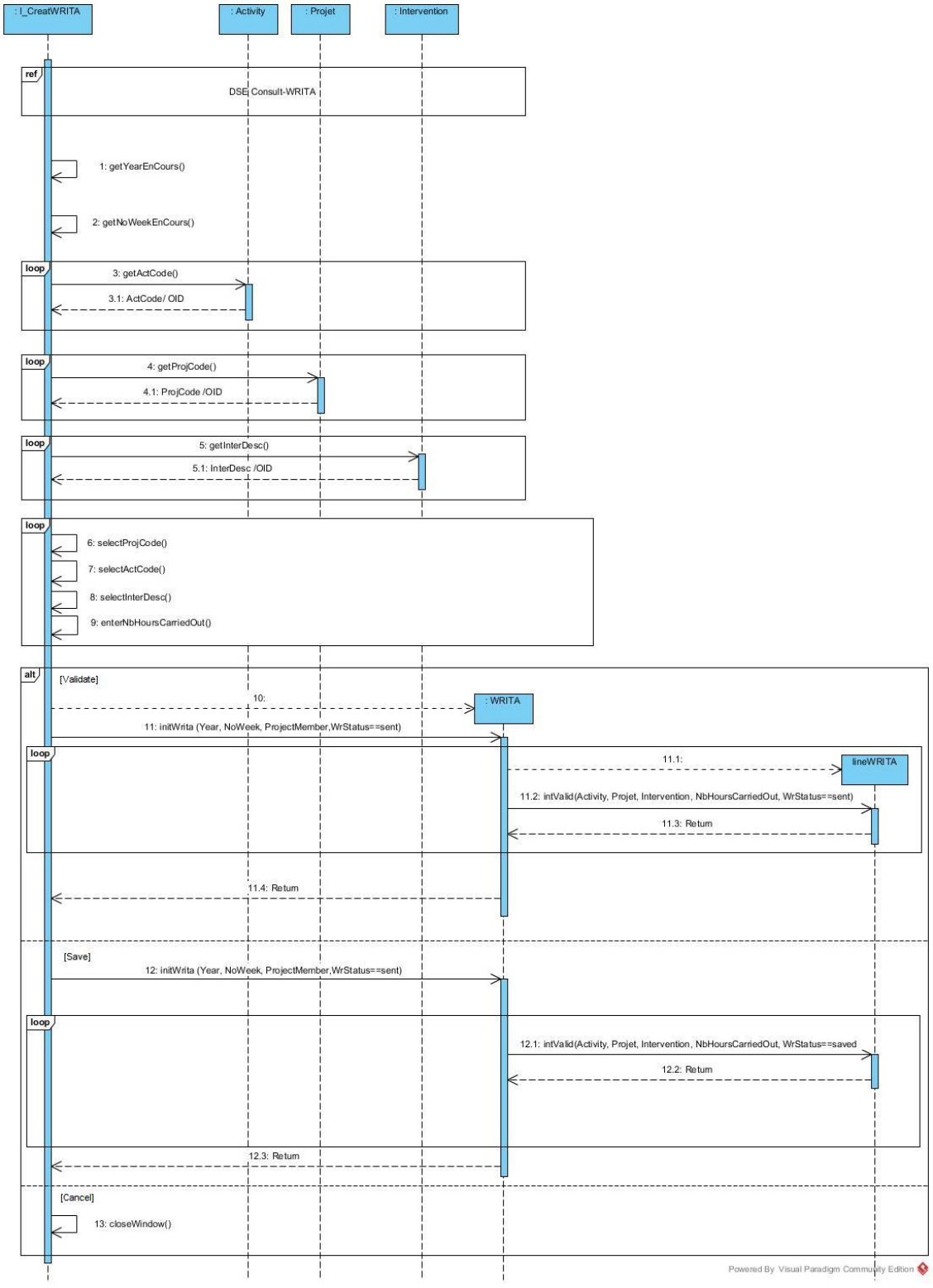
State chart Diagram: Status of a WRITA



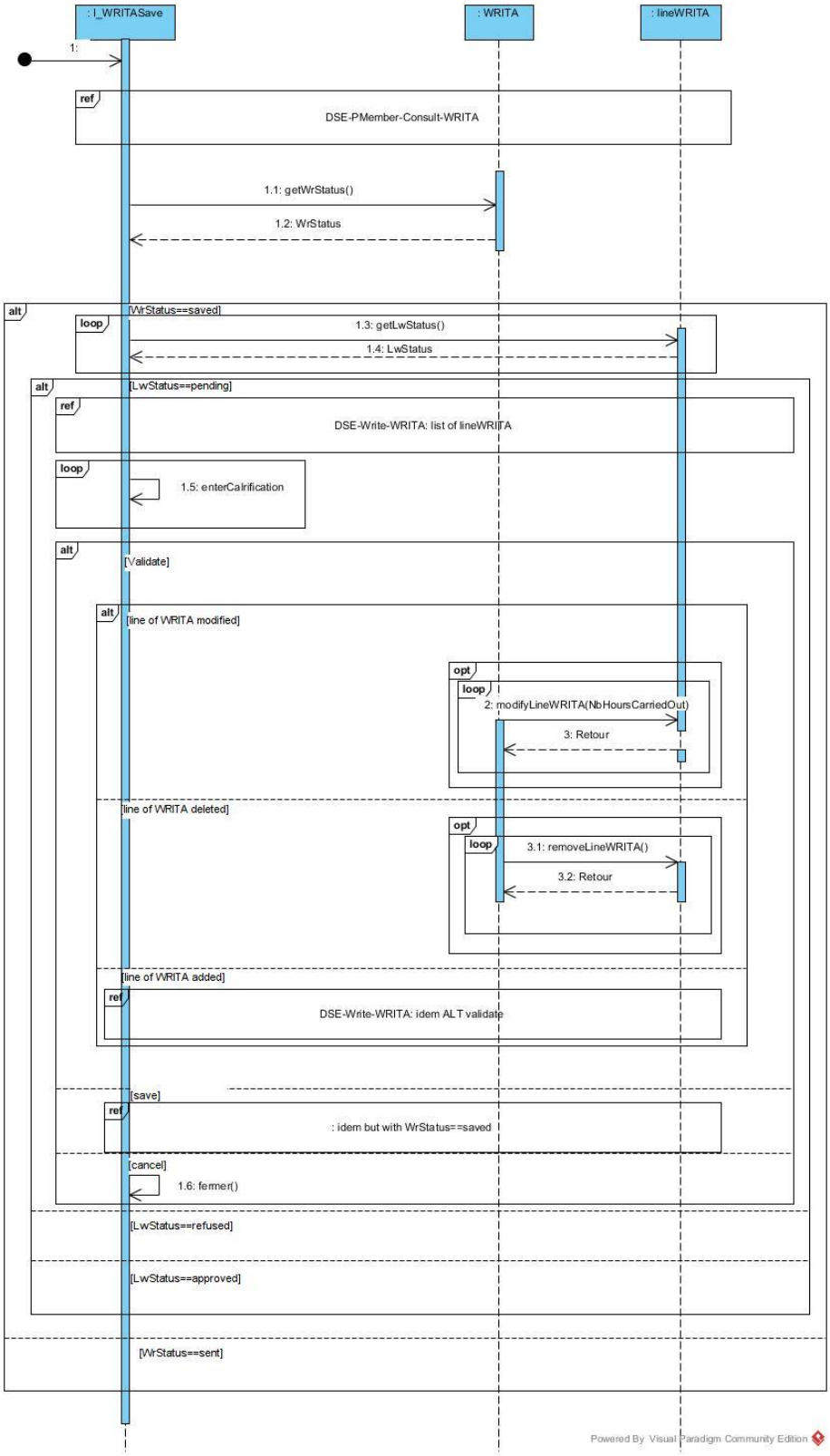
When a project member creates a WRITA, he fills the cells inside of the form with the appropriated data. Once the user has finished, he has 3 possibilities:
-he can confirm the WRITA which means the status of the summary will be updated to “sent”, archived and published for the other users;
- he can save the WRITA, the status will pass to “saved” and the summary will not be published. As the status is “saved”, the manager can re-open it and modify it;
- he can cancel the process which means that it will close the window without saving any data entered.

Diagrammes de Séquences (DSE) :

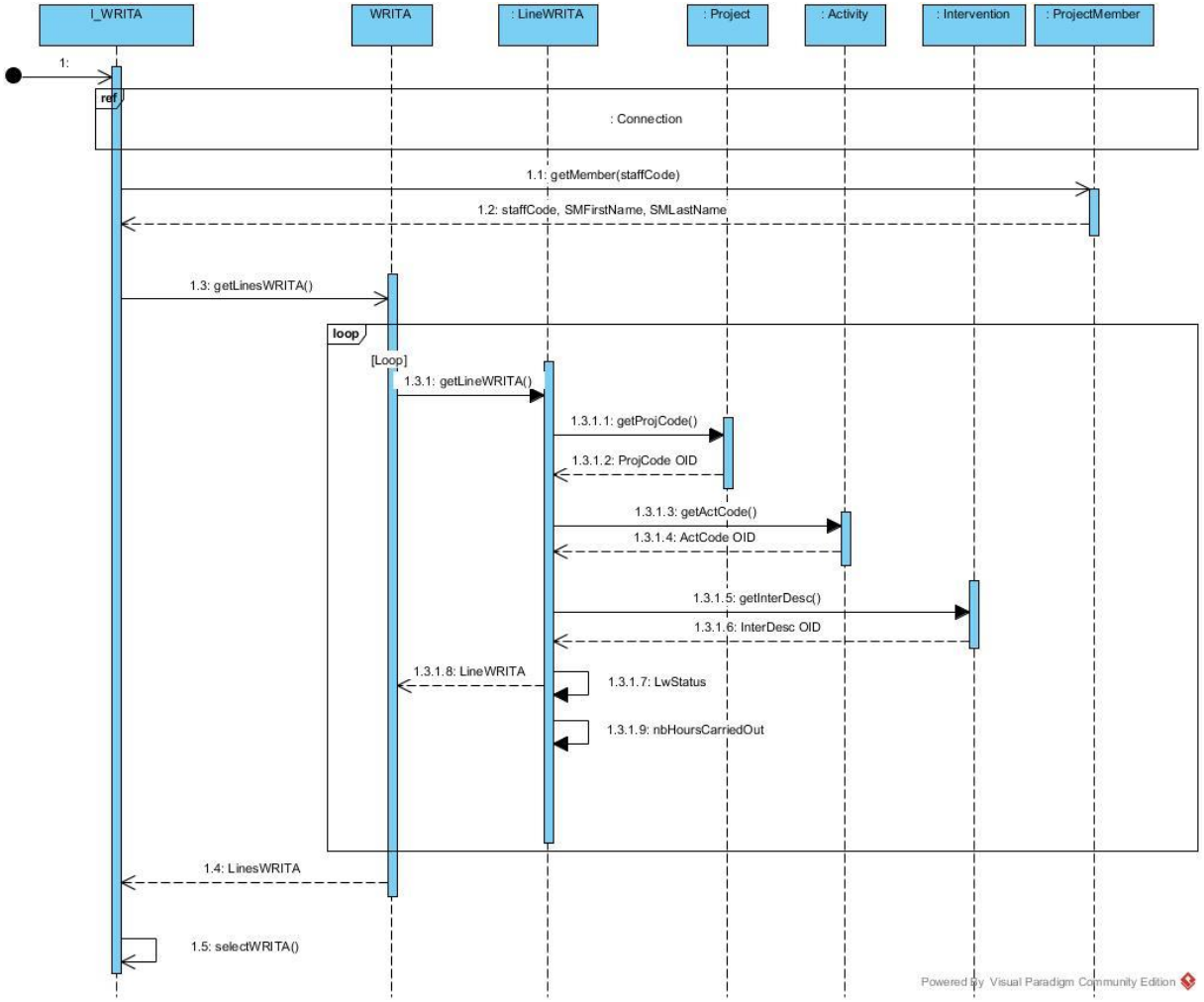
Sequence Diagram: Scenario 1 « write a WRITA»:



Sequence Diagram: Scenario 2 « correct or add information to WRITA »:

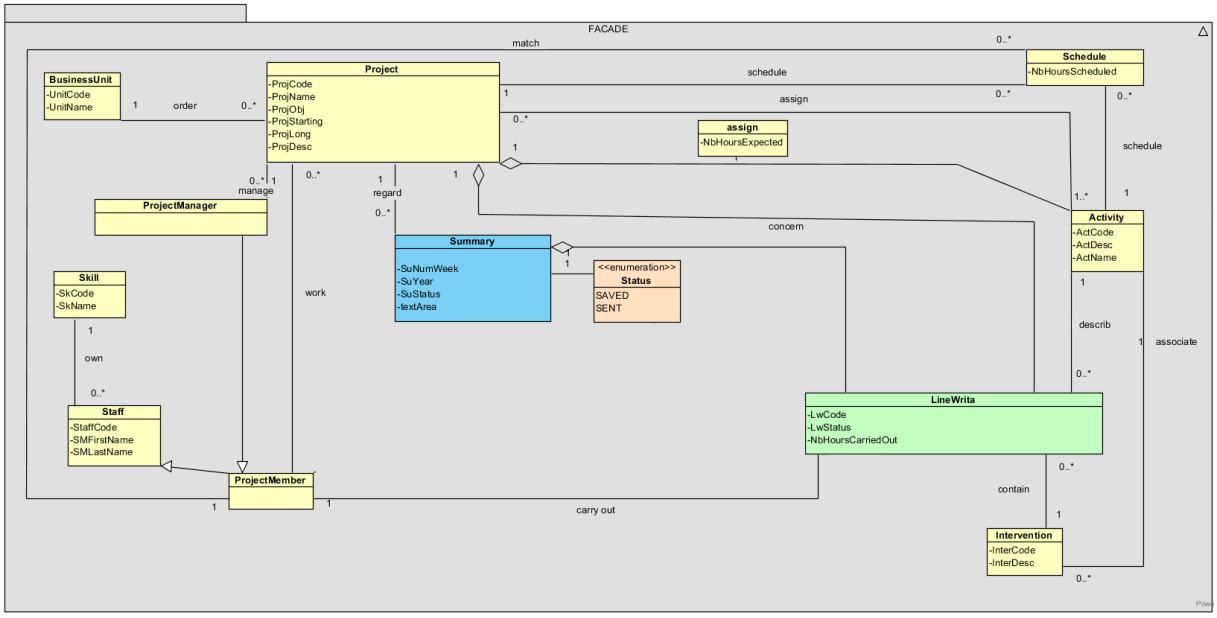


Sequence Diagram: Scenario 3 « consult a WRITA »:



2.2 Package (Use case) management of summary

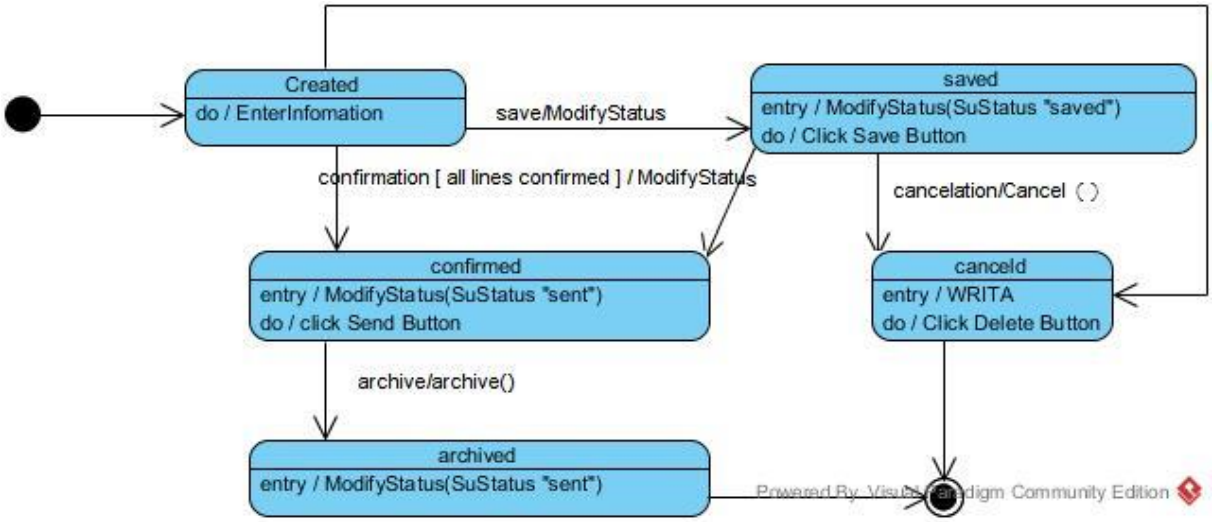
Partial Class diagram of the use case management of summary:



This is the partial Class diagram of the use case management of summary. We concentrate on summary. A summary presents all of the activities and interventions in a project, so we have to join the class summary and the class LineWrita. A line of WRITA contains the code of activity, the code of project, a description of intervention and the code and name of the project manager who manage this project.

A summary has a date, which include the year and the number of week; a text area, in which the project manager can write his comments about the project; the status, “saved” or “sent”. When the manager saves his comments, the status turns “saved”, which means he can rewrite or modify them later; when the manager clicks the button validate, his comments will be sent to the others, and he can’t modify it anymore.

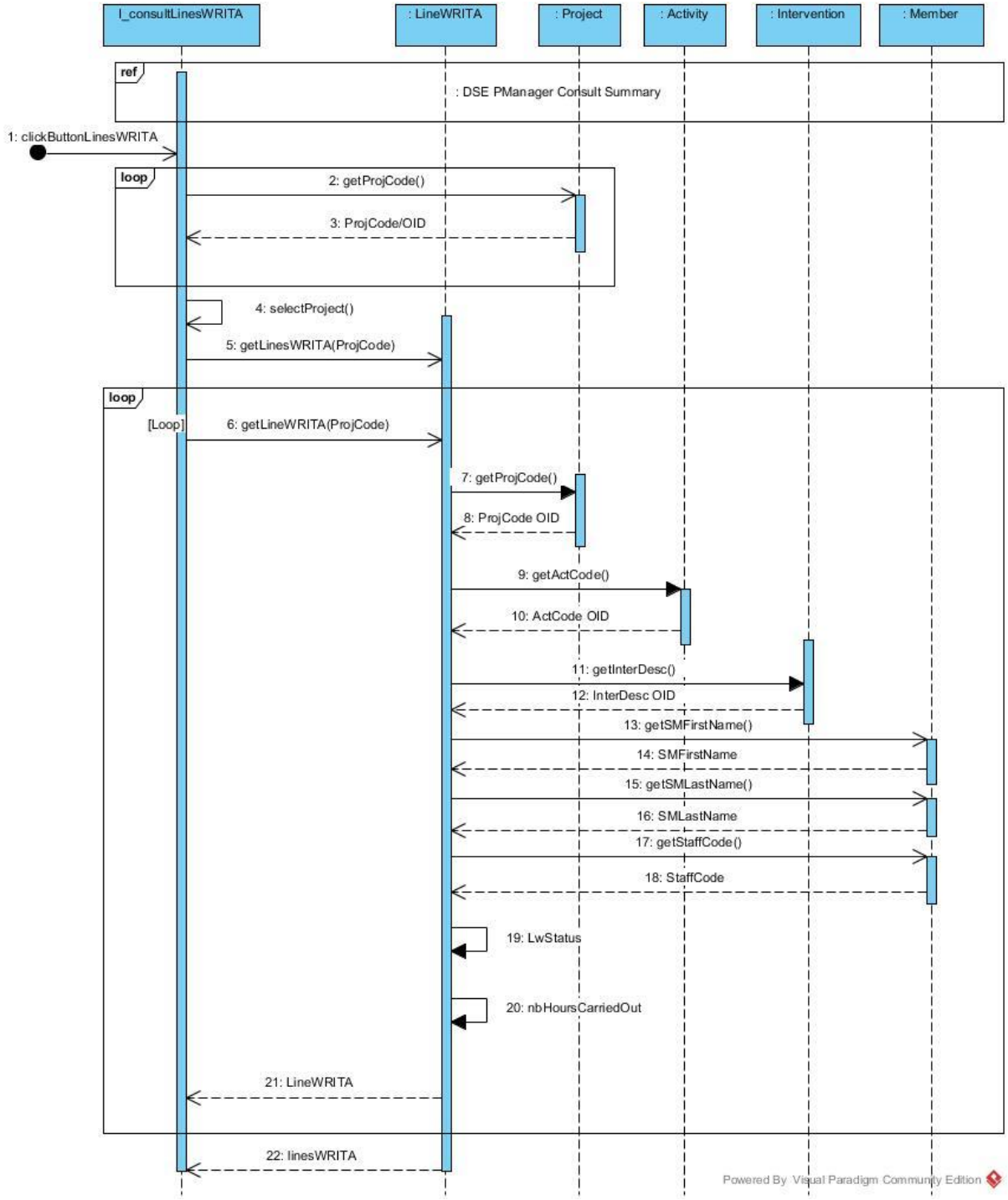
Transition state diagram (TSD) of the class Summary:



This diagram shows how to modify the status of a summary.
First, when a project manager creates a review of a summary, the status of the summary is set to “saved”. Then, when the manager has finished the edition of a summary, he has three options:
-he can confirm the summary which means the status of the summary will be updated to “sent”, archived and published for the other users;
-he can save the summary, the status will remain as “saved” and the summary will not be published. As the status is “saved”, the manager can re-open it and modify it;
-he can cancel the process which means that it will close the window without saving any data entered.

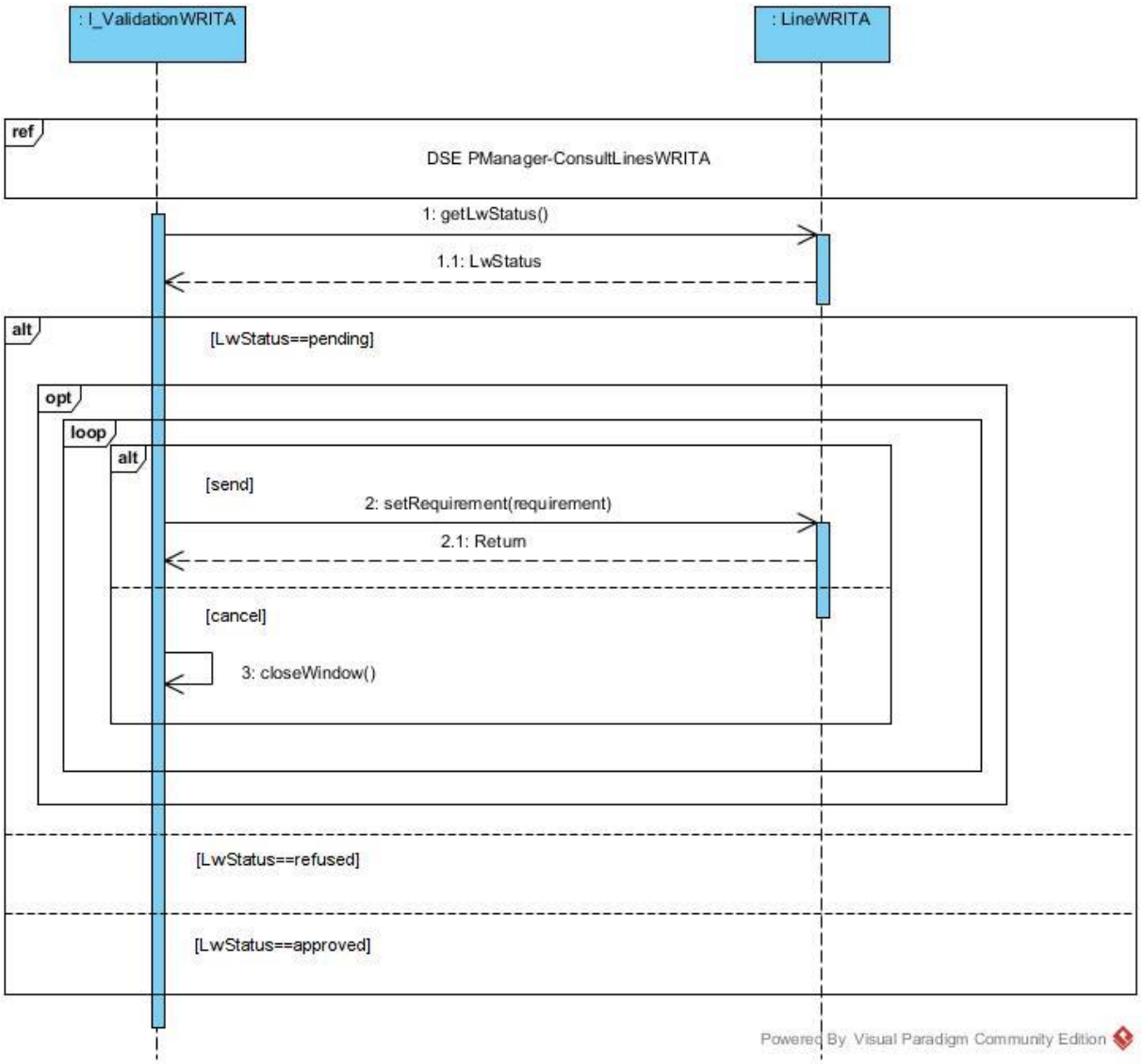
Sequence diagram:

Scenario 4 « consult lines of WRITA »:



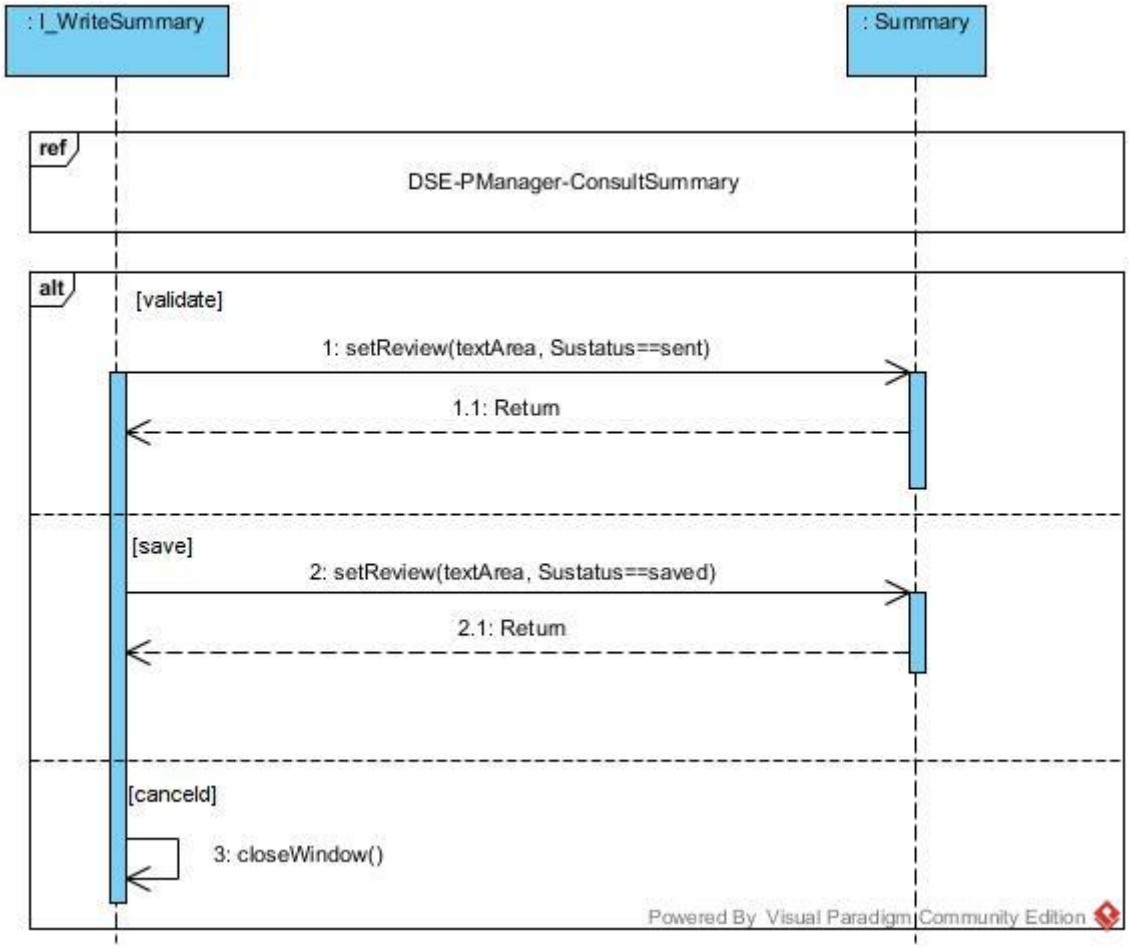
When the project manager wants to know how much time a member use for carrying out an intervention, he will at first select a project that he manages and consult each intervention line of the project, he will see the time exactly used for carrying out an intervention; he will also see the member who carries out this intervention.

Scenario 5 « check lines of WRITA »:



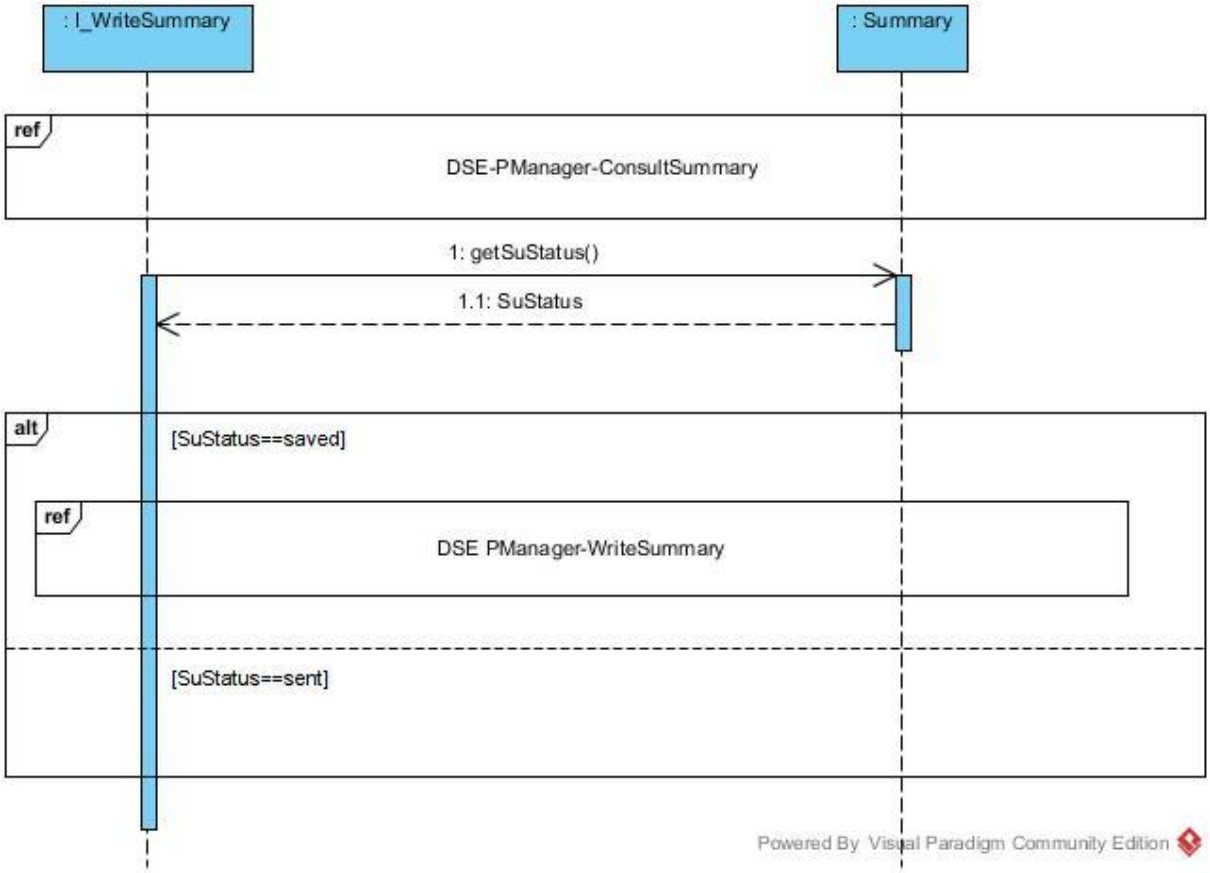
After consulting the intervention lines of the project, he can give his requirements to each member, or to indicate them if their reports are validated or no.

Scenario 6 « write a summary of WRITA »:



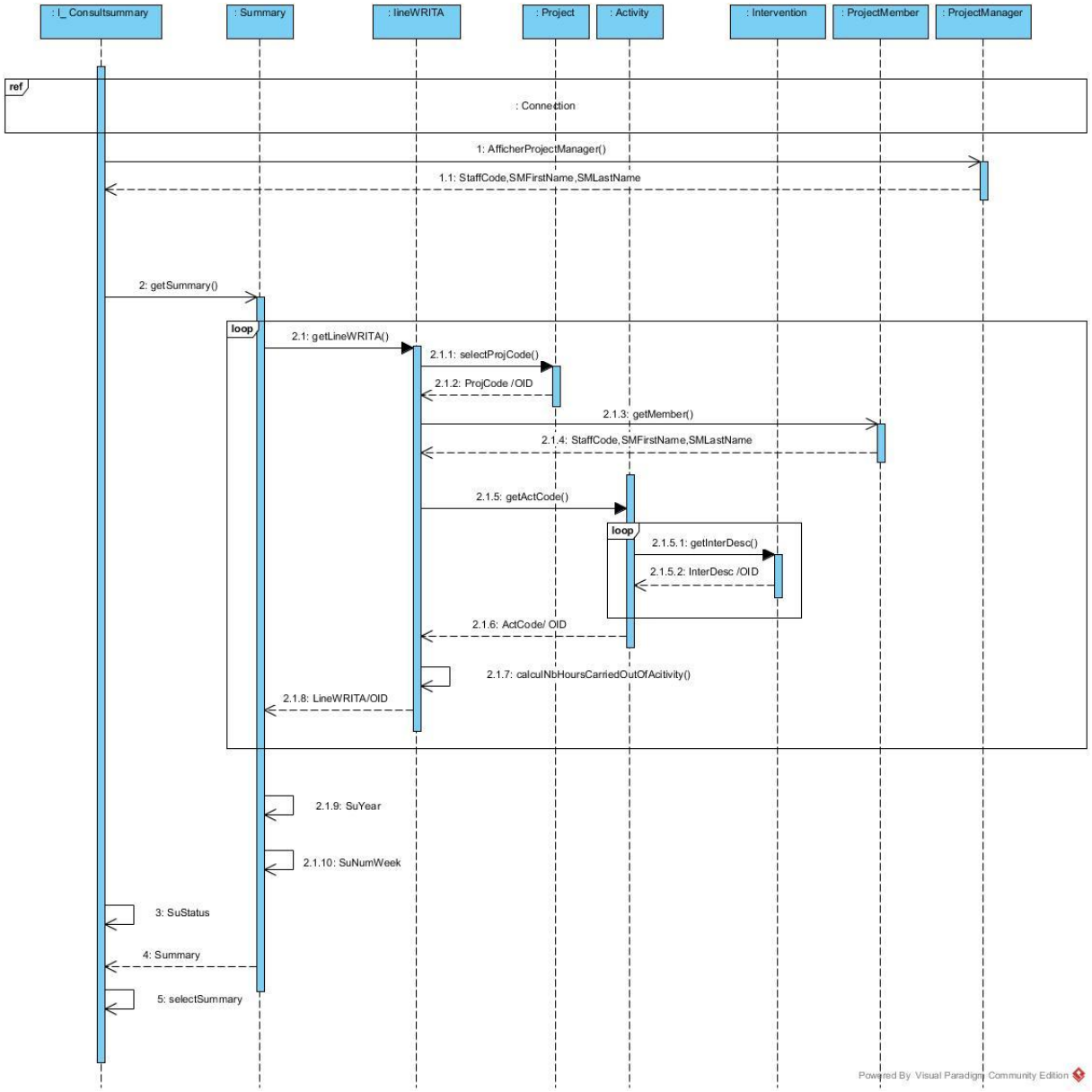
After consulting a summary of the project, the project manager can write a summary of WRITA, it means the project manager can write his comments to his project summary, or to clarify the progress of his project to the directors and the DED. After writing the comments and clarifications to a project, the project manager can save his writing in order to modify. once he sends his writing, he can't modify it anymore.

Scenario 7 « modify/continue writing the summary of WRITA »:



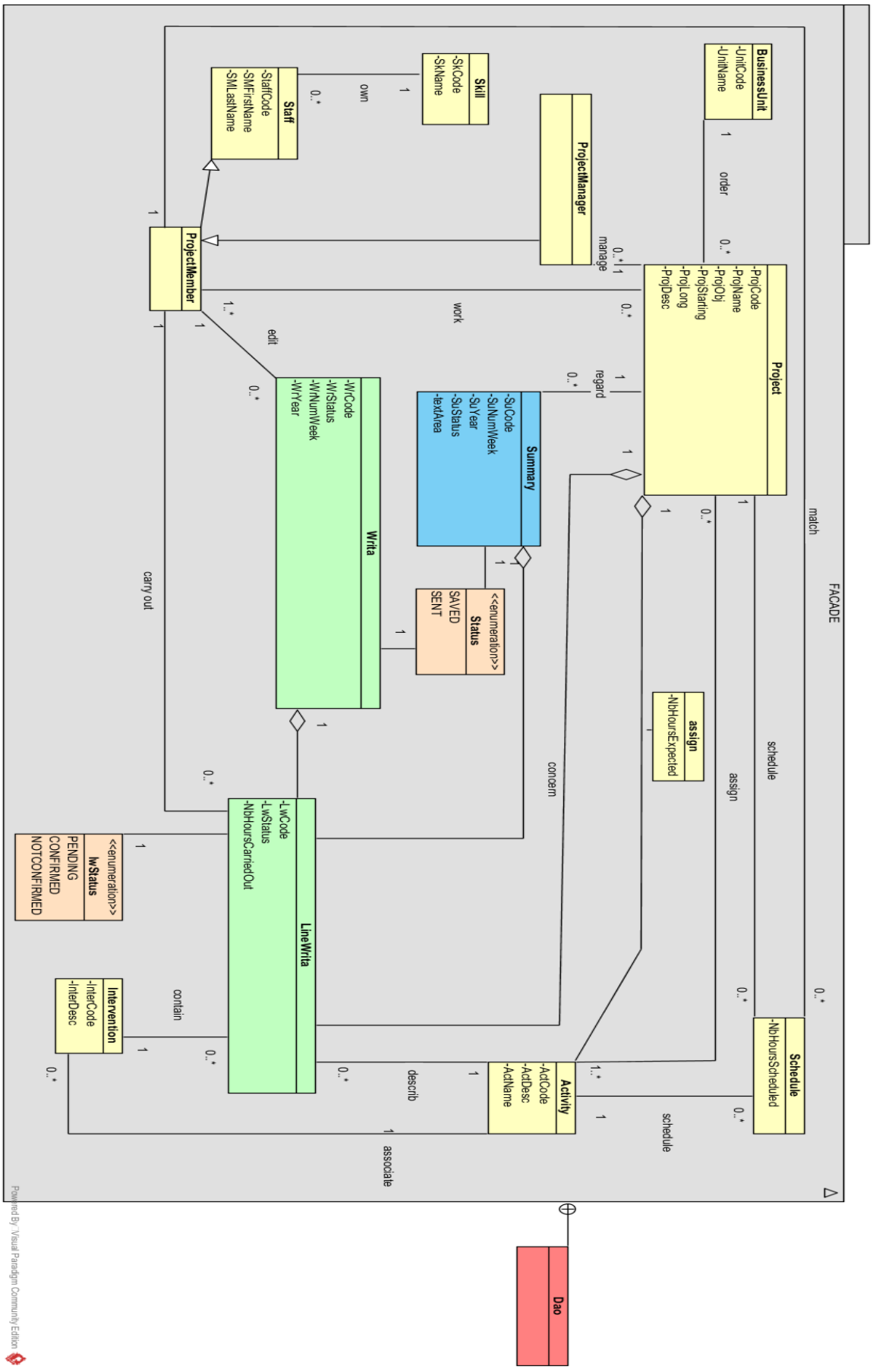
This scenario is just like the previous one, the project can continue writing his comments and clarifications to the project, save it for later modifications or send it to the directors and the DED.

Scenario 8 « consult summary»

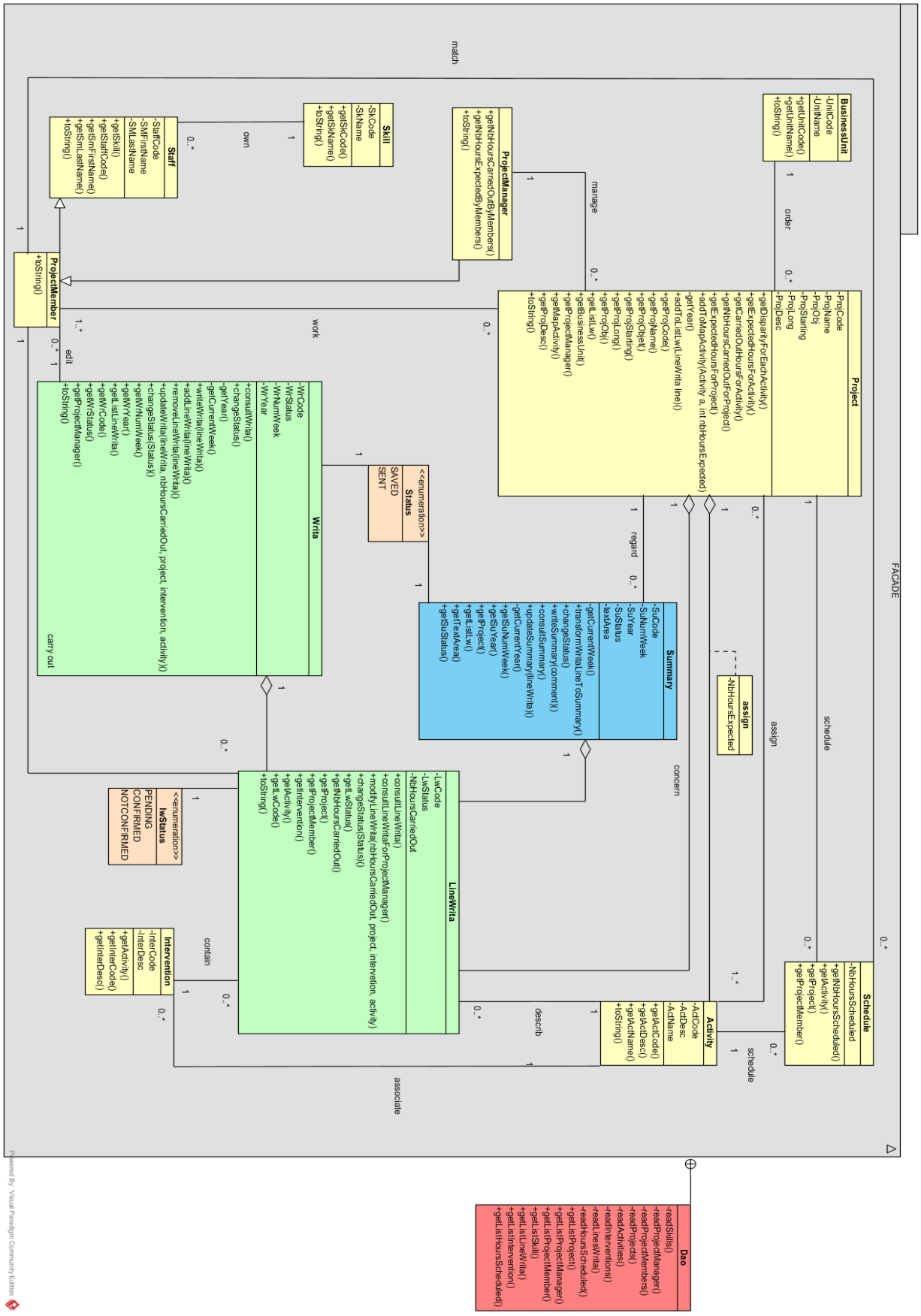


When the project manager connects, he will see a list of summaries with the corresponding date, he can choose one from these summaries to see the details.

Partial global Use Case Diagram



Global Use Case Diagram



ANNEXES :

Annexe 1: Attribute dictionary

Short name	Description	Type	Value Domain / Composition rule / Computation rule
ActCode	Code of IT activity	Text(6)	A99999
ActDesc	Description of IT activity	Text(250)	
ActName	Name of IT activity	Text(80)	
InterCode	Code of an intervention	Numerical / Integer	Code of the activity related + "-" + incremental 5 digit number
InterDesc	Description of an intervention	Text(200)	
LwCode	Code of a line of a WRITA	Text(25)	Code of the activity related + "-" + 5 last digits of the member related + "-"+ project code related
LwStatus	State of a WRITA's line	Text(30)	{"pending", "approved", "refused"}
NbHoursCarriedOut	Total number of hours declared by a project member for an intervention	Numerical / Integer	
NbHoursExpected	Total number of hours expected on given IT activity for given project	Numerical / Integer	
NbHoursScheduled	Total number of hours scheduled per staff member on IT activity and given project	Numerical / Integer	
NumWeekWr	Number of the week in a year	Numerical / Integer	
ProjCode	Project code	Text(7)	"P" + last two digits of the year + "-" incremental number (3 digits) of the project in the year
ProjDesc	Project description	Text(250)	
ProjLong	Project duration in days	Numerical / Integer	
ProjName	Project name (short name)	Text(150)	
ProjObj	Project objective (long name)	Text(150)	
ProjStarting	Project starting date	Date	
SkCode	Code of a skill	Text(3)	
SkName	Name of a skill	Text(30)	
SMFirstName	Staff member's first name	Text(80)	
SMLastName	Staff member's last name	Text(80)	
StaffCode	Staff member's staff code	Text(9)	3 digit number (assigned according to the basic qualificatiton) + "-" + incremental 5 digit number (5 digits)
SuNumWeek	Number of the week in a year when a Summary is published	Numerical / Integer	
SuStatus	State of a Summary	Text(10)	{"sent", "saved"}
SuYear	Year when a Summary is published	Numerical / Integer	
textArea	Text written by a project manager that will be added to the list of lines of WRITA. Allows the manager to give information to the directors about the project	Text(500)	
UnitCode	Code of a Business unit	Text(8)	Alphanumerical characters
UnitName	Name of a business unit	Text(150)	
WrCode	Code of a Weekly Report of IT Activities	Text(30)	2 digits of the week + last two digits of the year + Staff member code
WrStatus	State of a WRITA's	Text(10)	{"sent", "saved"}
WrYear	Year when the WRITA is published	Numerical / Integer	

Annexe2: Home interface : consult summaries for DED-Project Managers – Business Unit Directors