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ABSTRACT

GENERAL INTRODUCTION

Chapter 1 :   
Framework Project Presentation

1.Introduction :

In this section, we will outline the framework of our project, starting from the company where we completed our internship, moving on to the system we will be working on, and finally, the methodology we have adopted for our work.

2.Company Presentation :

2.1. Leverage FC Presentation :

Leverage is a digitally-enabled financial services start-up that provides the complete set of corporate finance services. Built upon the principles of credibility, capability, and competence, they aim to bring financial acumen and excellence to their clientele.



To achieve sustainable profitable growth, a business must win in the market with an appropriate and rewarding business model, execute that model systematically, and maintain agility to survive change and challenges. This approach delivers returns, cash flow, and long-term value.

Leverage is established to support aspirational, ambitious businesses by partnering with them on their journey of change towards sustainable profitable growth.

2.2.Leverage FC Organization :

Leverage FC Company is organized into five departments, each with specific roles:

* **Accounting Department:** Manages financial records and transactions. Includes an Accounting Manager, Accounting Team Leader, and Accountants.
* **Financial Team:** Responsible for financial planning and analysis. Includes a Financial Manager and Financial Staff.
* **Analysis Team:** Analyzes business processes and identifies areas for improvement. Comprised of two Business Analysts.
* **Marketing Team:** Manages social media accounts and external relations. Consists of Marketing Specialists.
* **IT Department:** Manages IT operations and develops software applications. Includes a Team Leader and Developers.

3. Project Context:

3.1. The problem statement :

As a finance company, Leverage FC is committed to delivering a professional experience to its clients, aiding them in reaching their objectives. However, they encounter an issue with the manual nature of operations required by clients for reporting, calculations, and company management. This paper-based approach leads to inefficiencies and wasted time, highlighting the need for more modern solutions.

3.2. Proposed solution :

To present to the client a professional and user-friendly experience, Leverage FC has proposed to create a website that allows for the management of:

* Commercial operations
* Financial operations
* Purchases
* Expenses
* HR system
* Financial operations

All of this results in dashboards and calculations on commercial and financial operations, which serve to inform the client company about its level and situation, depending on various factors. Furthermore, there is a significant focus on user access, with an important part dedicated to each user and their role, which depends on the managing part they are involved in. Therefore, this platform represents a great opportunity to manage the operations of client companies of Leverage FC.

3.3 Global Architecture :

4.Adapted Methodology :

Before embarking on a project, it is essential to define the methodology and development process to ensure a successful approach. The modeling process is crucial for achieving a satisfactory and appropriate system solution. These sequential steps help refine the details of system realization, providing a clear vision and advancing understanding of the problem.

### 4.1. Agile Methodologies:

Agile software development encompasses a set of methodologies focused on iterative development. It involves evolving requirements and solutions through collaboration among self-organizing, cross-functional teams. Agile methods promote disciplined project management, emphasizing frequent inspection and adaptation. The approach emphasizes a leadership philosophy that encourages teamwork, self-organization, and accountability. It also includes engineering best practices for rapid delivery of high-quality software and a business approach aligning development with customer needs and company goals.

Once an organization decides to adopt agile development management, it still needs to choose the most suitable methodology. The available agile methods are numerous, which can be a source of confusion. To choose the right agile methodology for our project, we have elaborated a comparison between the SCRUM, XP, and RUP methods commonly used in companies:

|  |  |  |
| --- | --- | --- |
| Method | Pros | Consequence |
| XP | * Estimating Agile workloads at the team level. * Implementing simple Agile process improvement techniques. * Implementing extreme code quality techniques. | * Unclear implementation. * Lack of external risk monitoring techniques. |
| RUP | * Progressive integrations facilitate drama-free problem management. * Driven by client needs. * Based on architecture. | * Slow and less adaptable. * Requires predictability. |
| SCRUM | * Project breakdown into sprints for better structure. * Simplified processes. * Integrated transparency and deadlines. | * No written documentation. * Customer demand for increasingly complex functionality due to evolving needs. |

Based on this comparison, our choice is the SCRUM methodology. It ensures considerable time savings, improves development quality, and reduces the risks of problems.

4.2.Scrum methodology :

Using Agile Scrum involves developing products iteratively and collaboratively, using an approach focused on transparency, inspection, and adaptation. The Scrum philosophy emphasizes close collaboration between the development team, clients, and stakeholders to meet the changing needs of the project. Working with Scrum involves the following elements:

* **Sprint planning:** The development team (DT) and the Product Owner (PO) work together to plan the items to be developed during the current sprint, which has a fixed time period of 1 to 4 weeks during which the development team works to achieve the defined goals.
* **Sprint:** The DT works on the planned items for the sprint using collaborative development practices such as pair programming and code reviews to ensure quality.
* **Sprint review:** At the end of each sprint, the development team presents the results of their work to the Product Owner and stakeholders to get their feedback. This feedback is then used to adapt the next items to be developed.
* **Sprint retrospective:** At the end of each sprint, the DT reviews its own process and results to identify potential improvements for the next sprint.



4.3. Scrum Roles :

When working with SCRUM, the following roles are distinguished:

* **Product Owner (P.O):**
* Clearly express product backlog items.
* Order product backlog items to best achieve goals and missions.
* Ensure the value of the work the development team performs.
* Ensure that the product backlog is visible, transparent, and clear to all.
* Ensure the development team understands items in the product backlog.
* Scrum Master:
* Clearly communicate vision, goals, and product backlog items.
* Teach participants to create clear and concise product backlog items.
* Facilitate Scrum events as requested or needed.
* Coach in self-organization and cross-functionality.
* Remove impediments to the Development Team’s progress.
* Plan Scrum implementations within the organization.
* Help employees and stakeholders understand and enact Scrum.
* Development Team:
* Self-organize - turning product backlog into product increments.
* Cross-functional collaboration.
* Share accountability in the Development Team as a whole.
* Avoid sub-teams dedicated to particular domains.

5.Conclusion :

This chapter provided an overview of the company "Leverage FC" in which the project was undertaken, followed by a presentation of the project and its objectives, concluding with an overview of the work methodology. The next chapter will delve into the detailed requirements of our project.

Chapter 2 :   
Planning And Architecture

1.Introduction :

In this chapter, our focus will be on gaining a clearer understanding of how we will implement the Scrum process framework. We will begin by examining the global use case diagrams from our project's product backlog, followed by a presentation of the development environments. Through these steps, we aim to ensure transparency, control, and quality that align with the project's objectives.

2. Requirement Studies :

The concept of developing this application originated from a critical requirement identified by the product administrator and the client's needs. This requirement necessitates thorough study and analysis to deliver a solution that aligns with the client's needs and expectations. It is imperative to clearly understand the company's expressed requirements. To achieve this, we outline the various functional and non-functional needs associated with our system.

2.1. Identifying Actors :

An actor refers to any individual or organization that interacts with our web application. These actors may include end users, owners, developers, and administrators of the application.

In our application, we identify the following actors:

* **Super Admin :** The super admin is the leverage Director , he has access to view all aspects of the site, including financial, commercial, operational, HR, and purchase sections of each company. This includes inputs, dashboards, and reports, allowing them to observe all information regarding each client company
* **FDB Admin:** This admin has the right to manage client companies on the site. He can add, delete, and modify client companies and their information. He also adds, deletes, and modifies the Company admin of each company so that he can log in successfully and perform his responsibilities accordingly.
* **Company admin:** He has the right to manage the users of the site who are part of his company. He can add, modify, and delete them. He also has the right to perform all operations on the financial, commercial, operational, HR, and purchase parts for his company.
* **Company manager:** He is granted the privilege to access and review reports pertaining to both commercial and operational activities.
* **Commercial Manager:** He is authorized to oversee all aspects of the commercial section. This includes the ability to create opportunities, monitor their progress, access opportunity lists, perform calculations related to commercial operations, and generate detailed dashboards in the form of reports for these operations.
* **Commercial user:** This role includes the privilege to initiate new opportunities, monitor their advancement, and access comprehensive lists of available opportunities. This user actively contributes to the growth and refinement of the company's commercial initiatives.
* **Operations Manager:** This role grants access to oversee all aspects of the operational section. This includes creating projects, monitoring their progress, accessing project lists, performing calculations related to operational activities, and generating detailed dashboards in the form of reports for these operations.
* **Operational user:** This role grants the ability to initiate new projects, track their progress, and access detailed lists of available projects. This user actively contributes to enhancing and refining the company's operational initiatives.
* **Expenses Manager:** The expenses manager has the authority to view expenses and approve them after they have been added by an expense user.
* **Expenses user:** This user has the ability to add expenses and add products that must be validated by the expenses manager.
* **Purchase Manager:** The purchases manager has the authority to view purchases and approve them after they have been added by an purchase user.
* **Purchases user:** This user has the ability to add purchases, add products and vendors that must be validated by the purchases manager.
* **HR Manager:** This manager is authorized to add all information regarding the company's human resources, including salaries, leaves, and more.
* **Financial Manager:** This role provides the authority to oversee all aspects of the financial section. This includes creating financial operations, monitoring their progress, and accessing lists of financial operations.
* **Financial user:** This user has access to view financial invoices only.

2.2. Functional Requirements :

The website is divided into two sections: one for the Leverage company admin, who created and oversees the site, and another for the client, who can perform multiple operations based on their requirements.

* **Functional requirements for the super Admin :**
* Authentication: Enables login to access the pages the user is authorized to view.
* Commercial Management: Allows viewing and monitoring of all commercial operations information for each company.
* Operational Management: Enables viewing and monitoring of all operational operations information for each company.
* Financial Management: Provides access to view and monitor all financial operations information for each company.
* Expenses Management: Allows viewing and monitoring of all expenses information for each company.
* Purchases Management: Provides access to view and monitor all purchases information for each company.
* HR Management: Enables viewing and monitoring of all human resources information for each company.
* Dashboard Access: Allows viewing of dashboards for operational, commercial, and financial sections.
* **Functional requirements for the super FDB Admin :**
* Authentication: Enables FDBAdmin to log in and access authorized pages.
* Company management: Adds, modifies, and deletes client companies for leveraging purposes.
* Management of company admins: Adds, deletes, and modifies admins for each client company, enabling access to various parts of the platform and specific functionalities.
* **Functional requirements for the super Company Admin :**
* Authentication
* Website company user management: Adding, modifying, and deleting customer company employees.
* Assigning roles to each employee for managing specific parts.
* Managing commercial operations.
* Managing operational operations.
* Managing financial operations.
* Managing purchases.
* Managing expenses.
* Managing Human Resources for the company.
* **Functional requirements for the super Company Manager :**
* Authentication
* Viewing reports and dashboards for the commercial department
* Viewing reports and dashboards for the operational department
* Viewing reports and dashboards for the financial department
* **Functional requirements for the super Commercial Manager :**
* Authentication
* Creating opportunities
* Monitoring progress
* Accessing opportunity lists
* Performing calculations related to commercial operations
* Generating detailed dashboards in the form of reports
* **Functional requirements for the super Commercial User :**
* Authentication
* Starting new opportunities
* Tracking opportunities progress
* Accessing detailed lists of available opportunities
* **Functional requirements for the Operations Manager:**
* Authentication
* Creating projects
* Monitoring the progress of projects
* Accessing lists of projects
* Performing calculations related to operational activities
* Generating detailed dashboards in the form of reports for these operations
* **Functional requirements for the Operations User :**
* Authentication
* Initiating new projects
* Tracking project progress
* Accessing comprehensive lists of available projects
* **Functional requirements for the Expenses Manager:**
* Authentication
* Viewing expenses added by expenses users
* Approving expenses added by expenses users
* **Functional requirements for the Expenses User:**
* Authentication
* Adding expenses
* Adding necessary products for the expense, which must be approved by the expense manager
* **Functional requirements for the Purchase Manager:**
* Authentication
* Viewing purchases
* Approving purchases
* Approving vendors for adding purchases
* Approving products for adding purchases
* **Functional requirements for the Purchase User:**
* Authentication
* Adding purchases
* Adding products used to create a purchase
* Adding vendors if they are not found in the list and are used to create a purchase
* **Functional requirements for the HR manager:**
* Authentication
* Adding information about the company's human resources
* Adding secondary information about salaries, vacations, etc.
* **Functional requirements for the Financial Manager:**
* Authentication
* Creating financial operations
* Monitoring the progress of financial operations
* Accessing lists of financial operations
* **Functional requirements for the Financial User:**
* Authentication
* Viewing financial invoices

2.3. Non-Functional requirements :

Non-functional requirements encompass the features and attributes that contribute to the overall quality and proper operation of an information system. Our application is required to adhere to the following non-functional requirements:

* **Software Performance:** This includes various indicators such as the completeness of functionalities, correctness and accuracy of results, reliability, fault tolerance, ease of use, simplicity, extensibility, compatibility, portability, ease of correction and transformation, performance, and the coherence and integrity of information within the software.
* **Reliability:** Our project ensures the completeness, accuracy, consistency, and availability of data and results from queries or treatments, as well as the regularity of behavior, including response time and stability.
* **User-Friendly UI/UX:** Customization of the Dashboard design, including the ability to select tab colors, sidebar background images, and switch between light and dark modes to enhance user experience.

3.Product Backlog :

3.1.Product Backlog Specification :

To gain a comprehensive understanding of the Scrum methodology, we must familiarize ourselves with the following terms:

* **Product Backlog:** This is a dynamic document that initially contains the project requirements collaboratively structured with the customer. It evolves throughout the project based on changing customer needs and priorities.
* **Sprint Backlog:** At the beginning of each sprint, we define a specific objective and goal. During the sprint planning meeting, the development team selects the already defined elements from the product backlog to be implemented in that sprint. These selected elements form the sprint backlog.
* **User Story:** This term describes detailed functionality from the perspective of an end-user. User stories are used to define the requirements of the software and are typically written in a non-technical language.
* **Scrum:** This is a daily meeting held during the sprint, known as the Daily Scrum or Stand-up. During this meeting, the team discusses the progress of the project, any obstacles they are facing, and plans for the day.

2.2. Prioritized product backlog:

First, we employed the MoSCoW method to prioritize the needs or requirements of the product backlog. We assessed the value of a user story or task using the following levels of the scale:

"Must have": These are essential features.

"Should have": These are important features.

"Could have": These are comfort features.

3.3. Global use case diagram :

We present a comprehensive diagram illustrating the global use case, providing an overarching description of the diverse activities within our website. This diagram highlights the various actors involved and elucidates their respective roles in the system.

4.Work environment :

4.1. material environment :

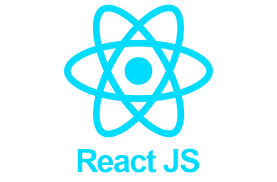
A development laptop with the following specifications :

* Processor: 12th Gen Intel(R) Core(TM) i5-1235U 1.30 GHz
* Installed RAM: 8.00 GB (7.72 GB usable)
* Device ID: 4B77CAC1-8F05-4107-8F19-D3C390B8FF99
* Product ID: 00342-43287-74246-AAOEM
* System Type: 64-bit operating system, x64-based processor

4.2. Software environment :

* **ReactJS**

React est une bibliothèque JavaScript open-source développée par Facebook. Elle est principalement utilisée pour construire des interfaces utilisateur interactives et dynamiques. En se concentrant sur la création de composants réutilisables, React simplifie le développement d'applications en permettant une mise à jour efficace et réactive de l'interface en fonction des changements dans les données. Adopté par de nombreux développeurs, React facilite la construction d'interfaces utilisateur modernes et performantes pour les applications web.

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* **VS Code :**

Visual Studio est une suite d'outils de développement logiciel développée par Microsoft. Cet environnement intégré offre des fonctionnalités telles que l'édition de code, le débogage et la gestion de projets, simplifiant ainsi le processus de création d'applications informatiques.



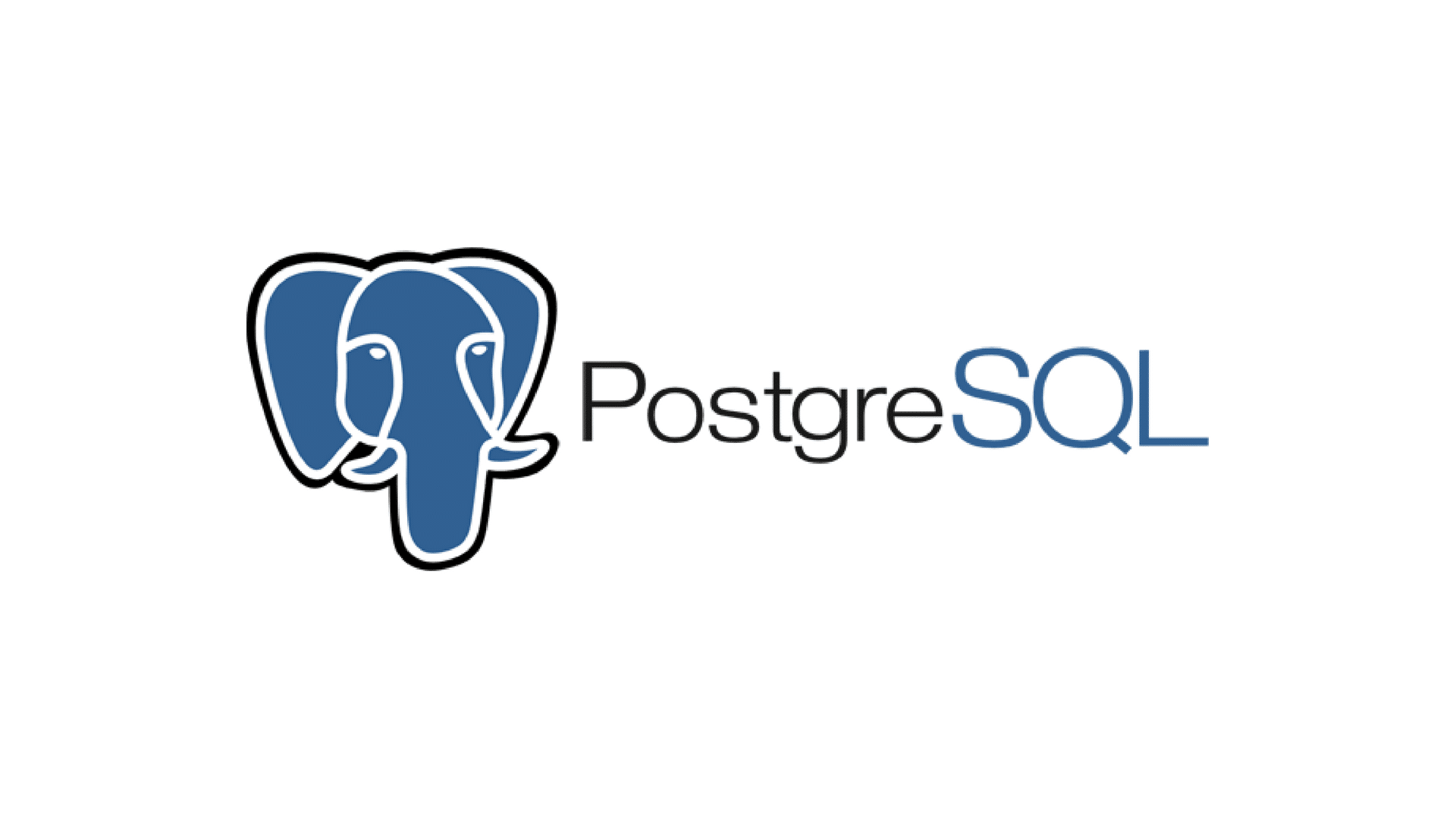
* **Visual Studio :**

Visual Studio is an integrated development environment (IDE) created by Microsoft. It is used to develop computer programs, websites, web apps, web services, and mobile apps. Visual Studio provides a wide range of tools and features, including a code editor, debugger, compiler, and designer. It supports various programming languages such as C#, Visual Basic, C++, Python, and more. Visual Studio also offers collaboration tools, version control integration, and cloud services for building and deploying applications.



* **PostgreSQL :**

PostgreSQL, often referred to as Postgres, is an open-source relational database management system (RDBMS). It is known for its robustness, reliability, and feature-rich capabilities, making it a popular choice for many applications and industries. PostgreSQL supports various advanced features such as multi-version concurrency control (MVCC), which allows for high concurrency and scalability, as well as support for JSON, XML, and other data formats. It also offers extensive support for SQL standards and has a vibrant community that continually contributes to its development and improvement.



5.Conclusion :

In this chapter, we gained a comprehensive understanding of how we applied the Scrum process framework. We started by exploring the overall process, then delved into detailed use case diagrams for all actors interacting with our application, as defined in the product backlog. Additionally, we reviewed our development environment and the technologies we utilized to realize our project.