Republic of Tunisia
The Ministry of Higher Education
and Scientific Research

The University of Carthage

The Higher Institute of Information and
Communication Technologies

END-OF-STUDY PROJECT REPORT

Submitted in Partial Fulfillment of the Requirements for the
BACHELOR DEGREE IN SOFTWARE ENGINEERING AND INFORMATION SYSTEMS

Field of Study : Software Engineering and Information Systems

Development of an Employment Services Web Platform

By
ISLEM BARGAOUI
YUSSEF MRABET

Conducted within ...

Code Cooperation

Academic Year: 2021-2022

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Signature:

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Fahima Ben Guirat

Issued on :

Signature:

Dedications

To my family **Mounir Bargaoui** and **Sawcen Ben Khayatia**,
thank you for your unwavering support and encouragement throughout my academic journey. Your belief in me has been the foundation upon which I have built my success, and I am forever grateful for your love and guidance,
I would like to express my gratitude to my friends for their unwavering support and encouragement. Your constant inspiration and motivation have been instrumental in my academic journey, and I am thankful for your presence in my life. .

Islem Bargaoui

With great pride, sincerity and affection, I dedicate this work to all the people who have significantly influenced my life. To my parents, who instilled in me the most important values in life and who have been my constant mentors throughout my educational and professional journey.

To my sisters, who have supported and encouraged me in all my endeavors, and who have always given me the strength to pursue my dreams. To my closest friends, who have been a constant source of joy, laughter and support throughout my life. I also dedicate this work to all the people who believed in me, trusted me, and allowed me to grow as an individual. Let this modest work be an expression of my gratitude and love to all of you. I thank you for your moral support and encouragement throughout my journey. You have been strong pillars in my life and I am deeply grateful for your presence. I wish you all the happiness, peace and prosperity that you deserve. You are the reason I did this work, and I am honored to be able to share it with you all.

Yussef Mrabet

To our Supervisor, **Dr. Fahima Ben Guirat**, For believing in us and helping us finish our end of studies project, you have our most grateful thanks.

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General introduction

In today's fast-paced and competitive world, finding employment can be a challenging and daunting task. While job boards and employment agencies exist, they may not always provide the best fit for job seekers or employers.

To address this issue, we present TippJob, a platform that connects individuals or businesses offering jobs with those seeking employment opportunities. TippJob offers a simple and efficient way to post job offers, whether it's for a full-time position or a one-time task, such as mowing a lawn. By creating a user-friendly interface, TippJob aims to make the job search process easier and more accessible for all users.

Our end-of-studies project provides an opportunity to develop this platform further and improve the user experience. Throughout this report, we will discuss the context of the project, the requirements specifications, and the implementation process of TippJob.

During our internship at Code Cooperation, we have followed the scrum Methodology to better organize our work and development, thus making our report consist of these following chapters:

- "**Context of the project**", The initial chapter will serve as an introductory study and provide the project's contextual background.
- "**Requirements Specification**", The second chapter of this report will be dedicated to outlining the project requirements, which is considered the first and most significant step in our development process. We will provide a detailed description of these requirements.
- "**Infrastructure Environment Setup**", the third chapter will present the set up of the deployment and the beginning steps of the development of TippJob.
- "**Release 1: User Profile Management**", This first release aims to provide users with an intuitive and seamless experience when creating and managing their profiles, enabling them to maintain control over their data..
- "**Release 2: Payment Integration and Job Posts**", the second release adds payment integration and job posting features, improving the platform's user-friendliness and value.
- "**Release 3: Enhanced User Experience**", The third and final release will introduce new search filters and messaging functionalities, designed to enhance user interactions and facilitate communication among users.

Chapter 1

Context of the project

1.1 Introduction

This chapter provides an overview of the host organization, details the project developed, outlines the technology choices made, and explains the methodology followed.

1.2 Presentation of the host organization

1.2.1 Host organization:

Code Cooperation is a startup builder and software development agency co-founded by Mr Taib Ben Dai as a CTO and Mr Mutas Bezari as a CEO. Their mission is to help startups bring their ideas to life through the development and deployment of web and mobile applications. Code Cooperation has worked with notable clients such as GIZ and TRANSLATLY.

What sets Code Cooperation apart from other agencies is their commitment to long-term partnerships with startups. They are interested in becoming a founding partner of the client's startup and being paid by equity, rather than short-term earnings. Code Cooperation's main idea is to offer startups of different stages a scalable CTO and/or development support, ranging from building a complete application to separate modules, components, and/or features. They charge only their low self-costs for this work, demonstrating their dedication to the success of their clients.

Figure 1.1: Company Logo

1.2.2 Areas of activity

The company specializes in providing solutions for businesses and startups, drawing upon their expertise in three primary sectors: software engineering, technical assistance, and consulting. Some examples of their solutions include:

- Ilioa Music
- Translatly
- seniorenplatzfinder
- relokatehr

1.3 Project presentation

1.3.1 Project framework

In today's fast-paced world, finding and offering job opportunities can be a time-consuming and challenging process. To address this issue, we developed Tippjob, a platform that connects job seekers and employers in a simple and efficient way. The platform provides a user-friendly interface for job posting, browsing, and applying.

1.3.2 Study of the existing

There are already several online job platforms available to the public, such as LinkedIn, Glassdoor, and Indeed. However, these platforms have their limitations and drawbacks that may cause inconvenience to job seekers, employers, and recruiters. Some of these limitations include:

- Traditional job platforms typically focus on full-time, long-term positions, while neglecting short-term, one-off, or part-time job opportunities.
- Limitation to certain industries or job types, making the user's choices narrow for a wider range of job offers.
- Candidates have to go through a lengthy application and screening process, which may not be necessary or practical for one-time or short-term jobs.
- Focusing on connecting candidates with employers, and missing the ability for individuals to post job offers for services they need (e.g. lawn mowing, pet care, etc.).
- Requirement for job seekers to have an established professional profile or resume, which could be a barrier for individuals who are just starting out or looking for casual work.

1.3.3 Proposed solution

With the increasing demand for job opportunities and the limitations of current job posting platforms, TippJob offers a comprehensive solution that connects job seekers and job providers in an easy-to-use platform. Using cutting-edge technologies and an intuitive interface, TippJob offers the following features:

- Seamless job posting and search functionalities for both employers and job seekers.
- Having a wide range of job types, from short-term to one-off, limited only by the user's imagination.
- The ability be more general about industries and cover a wider range of job offers.
- The posting and application process is streamlined to be quick and easy.
- This solution is not limited to connecting candidates with employers but could also allow individuals to post job offers for services they need (e.g. lawn mowing, pet care, etc.).

1.4 Project management Methodology

1.4.1 Methodology

The decision has been made that Scrum is the most appropriate and well-structured methodology for this project. However, for those unfamiliar, what exactly is Scrum?
It is a framework that promotes team collaboration in planning, developing, delivering, and sustaining products in different work settings using an agile and organized approach. The framework encourages decision-making based on past experiences and continuous learning from current work, allowing for reflection and improvement. Despite its structured nature, the Scrum framework remains agile and flexible, as depicted in the accompanying figure.

Figure 1.2: Scrum Structure[11]

The figure presented above illustrates the main stages involved in utilizing the SCRUM framework, which are as follows:

1. The product owner typically leads the creation of the backlog.
2. Team members plan the order in which to work on features based on their level of importance, defining the sprints.
3. Daily Scrum meetings, attended by the scrum master and team members, are held to provide daily progress reports.

1.5 Technical Choice

1.5.1 Development Technologies & Frameworks

Figure 1.3: Next.JS[8]
Description: Nest.js is a Node.js framework that provides a structured approach to building scalable and maintainable server-side applications. It was used for the back-end of the project.

Figure 1.4: Nest.JS[7]
Description: Next.js is a React framework that allows for server-side rendering and static site generation. It also includes features like automatic code splitting and optimized performance. It was used for the front-end of the project.

Figure 1.5: Prisma ORM[10]
Description: Prisma is a modern ORM for Node.js and TypeScript that provides a type-safe and easy-to-use database access layer. It was used to connect the Nest.js back-end to the MySQL database.

Figure 1.6: MySQL[6]
Description: MySQL is a popular open-source relational database management system. It was used as the database for the project.

Figure 1.7: Material UI[5]
Description: Material UI is a React UI framework that provides pre-built components with a consistent design language based on Google's Material Design. It was used for the front-end of the project to create a modern and responsive user interface.

Figure 1.8: OpenAPI[9]
Description: OpenAPI is a specification for building APIs that allows for automated generation of documentation, client libraries, and server stubs. It was used to define the API endpoints for the project.

Figure 1.9: Sonar[13]
Description: Sonar is a platform for continuous code quality inspection that provides metrics, code analysis, and feedback on code quality. It was used to ensure code quality throughout the development process.

Figure 1.10: Swagger[14]
Description: DigitalOcean is a cloud infrastructure provider that offers a range of cloud-based services for deploying and scaling web applications. It provides a simple and cost-effective platform, with a user-friendly interface and strong community support. it was used for the deployment of the project

Figure 1.11: Digital Ocean[1]
Description: Swagger is a toolset for designing, documenting, and testing APIs. It provides a user-friendly interface for defining API endpoints and parameters, and generates interactive documentation for developers. It also includes testing tools for verifying API behavior.

1.5.2 Collaboration and Developement Tools

Figure 1.12: Visual Studio Code[15]
Description: Visual Studio Code (VScode) is a popular code editor that offers a wide range of features and extensions to enhance productivity and streamline development workflows. It supports multiple programming languages and provides features such as IntelliSense, debugging, version control, and more.

Figure 1.13: Github Desktop[4]
Description: Github Desktop is a user-friendly desktop client for Github that makes it easy to manage repositories, collaborate with team members, and perform basic Git operations such as committing, branching, and merging.

Figure 1.14: Github[3]
Description: Github is a web-based platform for version control and collaboration that enables developers to store and manage code repositories, track changes, collaborate with team members, and perform code reviews.

Figure 1.15: Slack [12]
Description: Slack is a popular team communication tool that allows teams to collaborate and communicate in real-time via channels, direct messages, and integrations with other tools. It offers features such as file sharing, video calls, and app integrations.

Figure 1.16: Figma [2]
Description: Figma is a web-based design and prototyping tool that enables teams to collaborate on designing user interfaces, graphics, and other visual elements. It offers features such as vector editing, collaboration tools, and real-time design feedback.

1.6 General Architecture

We will use a deployment diagram to illustrate the overall architecture of our project, which includes the MSC stack architecture.

1.6.1 Deployment Diagram

A deployment diagram is a UML diagram that offers a clear and concise way to illustrate the architecture of a system. It shows how the different software components are distributed across hardware and execution environments, as well as how they interact through middleware.
Our project's deployment diagram is displayed in the figure below, offering a comprehensive overview of our system's architecture.

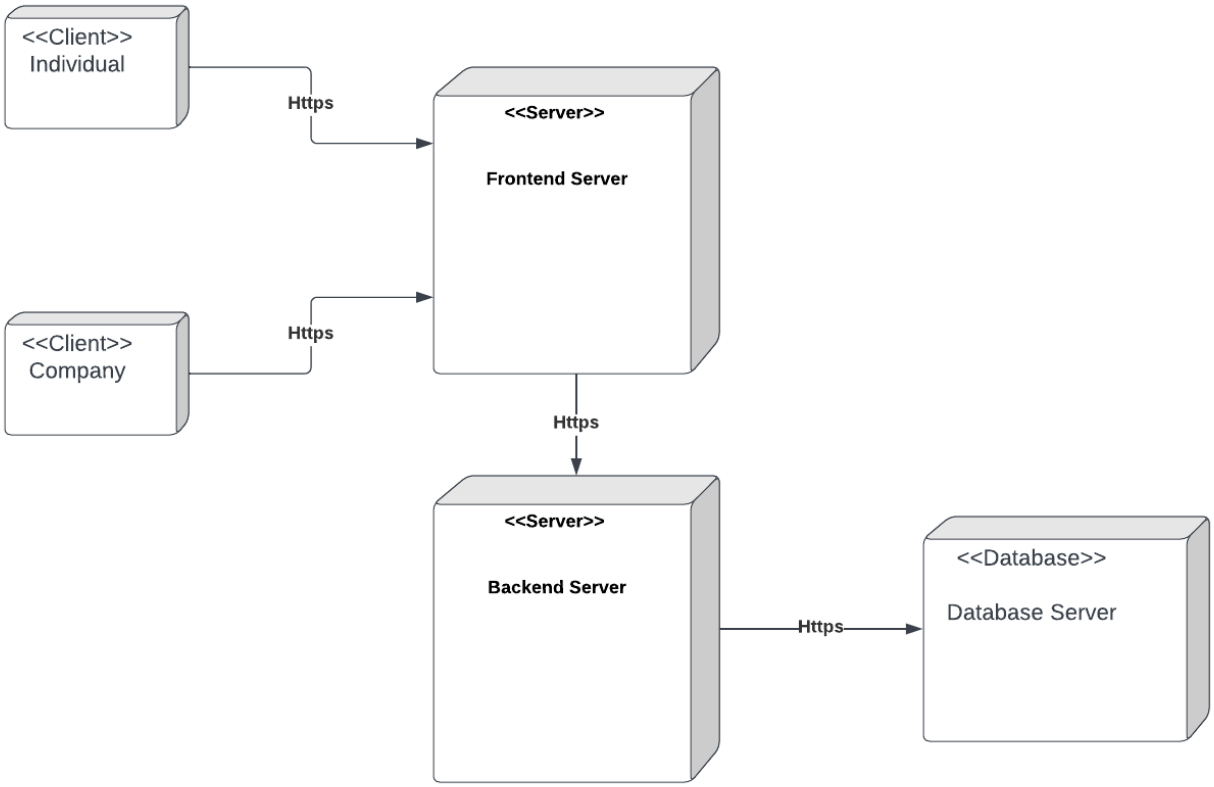

Figure 1.17: Deployment Diagram

1.6.2 MSC Stack Architecture

MSC, or Model-Service-Controller, is a variation of the traditional Model-View-Controller (MVC) architecture commonly used in web application development. In MSC, the View component is replaced by a Service component that encapsulates the business logic of the application. This approach promotes greater separation of concerns and can lead to a more modular and scalable application architecture.

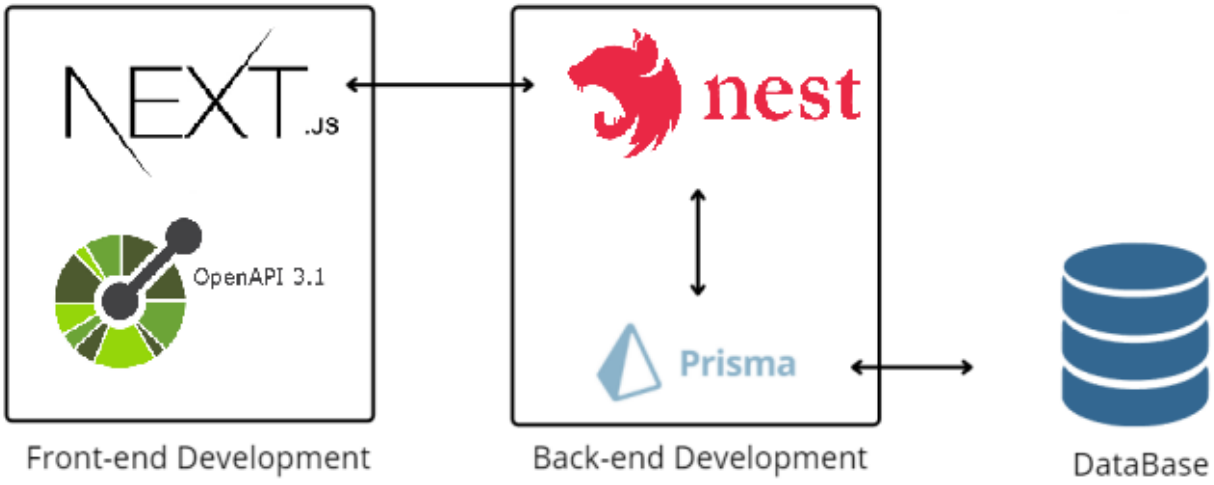

Figure 1.18: MSC Diagram

1.6.3 CI Architecture

Continuous Integration (CI) is a software development practice that involves frequently integrating and testing code changes to catch bugs and ensure that the software remains functional and stable throughout the development process. CI involves automating the build, test, and deployment process of software, allowing developers to quickly identify and fix issues as they arise. By integrating code changes frequently, CI helps to prevent integration problems that can occur when multiple developers work on the same codebase. This results in faster development cycles, higher quality software, and more efficient use of resources. the following figure represents our CI process.

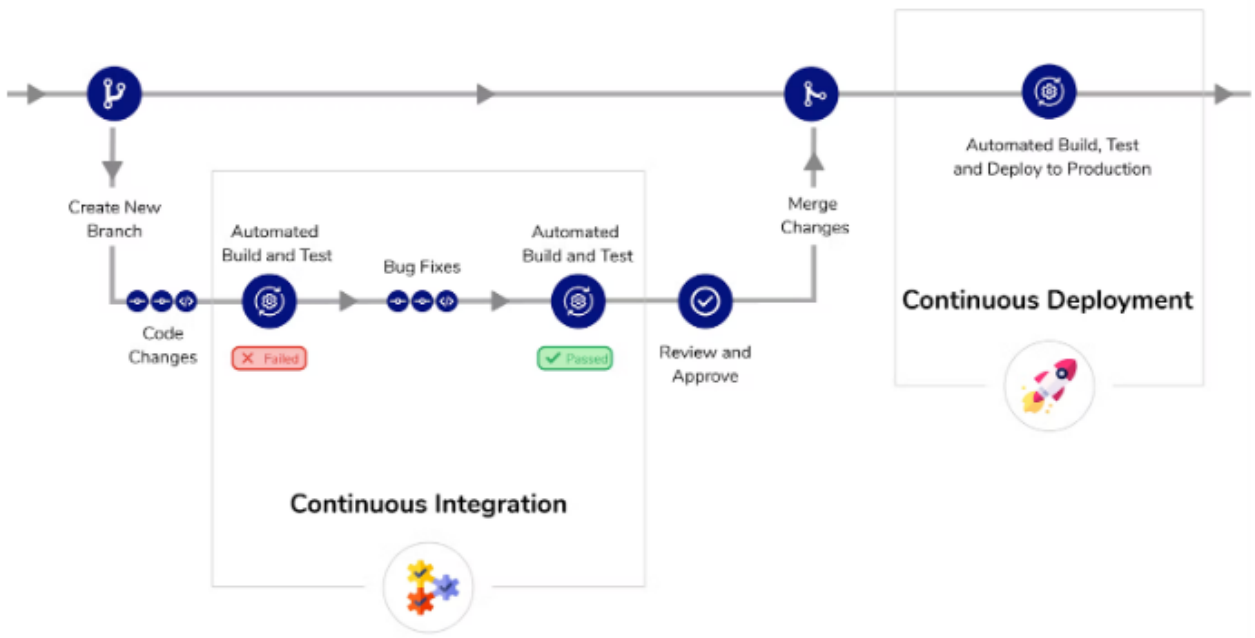

Figure 1.19: CI Diagram

1.7 Conclusion

This chapter outlines the overall framework of the internship program, and serves as a segue to the subsequent phase of needs specification and planning.

Netography

[1] *Digital Ocean*. URL: https://www.digitalocean.com/.

[2] *Figma*. URL: https://www.figma.com//.

[3] *Github*. URL: https://github.com/.

[4] *Github Desktop*. URL: https://desktop.github.com/.

[5] *Material UI*. URL: https://mui.com/.

[6] *MySQL*. URL: https://www.mysql.com/.

[7] *NestJS*. URL: https://nestjs.com/.

[8] *NextJS*. URL: https://nextjs.org/.

[9] *OpenAPO*. URL: https://www.openapis.org/.

[10] *Prisma ORM*. URL: https://www.prisma.io/.

[11] *Scrum*. URL: https://www.journaldunet.fr/web-tech/guide-de-l-entreprise-digitale/1443834-scrum-guide-de-la-methode-agile-star/.

[12] *Slack*. URL: https://slack.com/.

[13] *Sonarcloud*. URL: https://www.sonarsource.com/.

[14] *Swagger*. URL: https://swagger.io/.

[15] *Visual Studio Code*. URL: https://code.visualstudio.com/.