

General Introduction

Today's world is all about digital technology, and it's changing how businesses work everywhere. Companies are using these new digital ways to do their jobs better and faster. This change is really important because it helps businesses stay competitive and meet what their customers want. With digital tools, companies are becoming more efficient, like managing their data better and making smarter decisions.

In Tunisia, the Human Resources (HR) departments in many companies are just starting to use these digital tools. For a long time, HR work meant a lot of paperwork and manual tasks. But now, some companies are starting to use digital tools for things like keeping track of employee information. These tools make HR jobs easier and more organized, but there's still a lot more that can be done. Especially in recruitment – the way companies find and hire new people – there's a big chance to make things better with digital tools.

Right now, hiring people can be a slow process. HR teams often have to look through lots of CVs by hand and talk to people in person. But digital tools can make this much quicker and more accurate. They can help sort through CVs to find the right people and let companies do interviews online.

In this context of digital transformation, our project finds its purpose, aiming to modernize and enhance the HR processes at BeeCoders. We are tasked with developing a web-based HR platform to automate and streamline the recruitment process, utilizing React.js for the frontend and Node.js for the backend. This technology choice ensures a responsive and efficient user experience. The platform introduces innovative functionalities for submitting job applications, filtering CVs based on specific criteria, and conducting online interviews or tests. By leveraging advanced web technologies, including robust database management and dynamic user interfaces, the project aims to make the recruitment process not only more efficient but also better adapted to the evolving needs in HR management. Incorporating these cutting-edge technologies, the project marks a significant step towards digitizing HR processes at BeeCoders, aligning with global trends while addressing the unique requirements of the Tunisian work environment.

1.1 Presentation of the Hosting Organization: BeeCoders

1.1.1 Overview of BeeCoders

BeeCoders, established in 2020, is a leading enterprise in web and mobile development, IT consulting, and e-learning. Known for its innovative and quality-driven approach, BeeCoders specializes in creating unique digital products and solutions.

1.1.2 Core Business and Expertise

BeeCoders excels in developing custom digital products including websites, mobile apps, and software. The agency extends its expertise to IT consulting, helping businesses enhance their IT performance, and offers practical online training for those aspiring to build a career in IT.

1.1.3 Company Achievements

BeeCoders' track record is highlighted by its impressive portfolio:

- **232 Happy Clients**
- **521 Projects Completed**
- **1463 Hours of Support**

1.1.4 Mission and Values

BeeCoders is committed to delivering flexible, high-quality solutions and comprehensive support. The company values:

- **Flexibility:** Adapting to project requirements to ensure optimal development conditions.
- **Quality:** Aligning product development with modern technology and client specifications.
- **Support:** Offering effective e-learning and IT consulting to assist businesses and individuals in keeping pace with technological advancements.

1.1.5 Services Offered

BeeCoders' service portfolio includes:

- **Custom Solution Development:** Creating mobile apps, online stores, and custom websites.
- **IT Consulting:** Providing detailed diagnostics and solutions for digital strategy optimization.
- **E-Learning Programs:** Offering practical, coach-assisted online learning for rapid skill acquisition.

1.1.6 Expert Team

The backbone of **BeeCoders** is its dynamic and skilled team. Notably, Ahmed Neffati, a seasoned iOS Developer specializing in SWIFT for iOS and Kotlin and Java for Android, brings a wealth of expertise in mobile development. Jihed Ben Gharbia, a Java/Java EE engineer, leverages his passion for new technologies and his academic background from the Faculty of Sciences of Bizerte. Ahmed Yahmed, an autodidact video editor and UI designer, completes the team with his creative and competitive edge in multimedia. This team embodies the innovative spirit and technical prowess of BeeCoders.

1.1.7 IT Technical Partnerships

Working with reliable market partners, BeeCoders ensures enhanced service capacity and establishes itself as a dependable player in the IT industry.

1.2 General Context of the Project

1.2.1 Study of the Existing System

At BeeCoders, the current HR process, particularly for recruitment, is predominantly manual. Job and internship applications are received via email and processed by HR personnel. This involves manually reviewing each application, sorting CVs, and identifying suitable candidates for various positions. Due to the lack of automated tools or software, this process is time-consuming, often leading to a backlog of applications. Furthermore, the manual handling of applications increases the risk of human error, potentially overlooking qualified candidates or mismanaging applicant data.

1.2.2 Limitations of the Existing System

The primary inefficiency in BeeCoders' current HR system is the high time cost associated with processing applications. HR staff spend a significant amount of time manually sorting through CVs to find the right candidates for each job opening. This not only slows down the recruitment cycle but also impacts the overall productivity of the HR department. Another major limitation is the challenge in filtering CVs accurately for specific job requirements. For example, identifying candidates with specific skills like mobile programming requires going through each CV individually, which is inefficient and prone to errors. These limitations highlight the need for an automated, more efficient system that can handle these tasks with greater accuracy and speed.

1.2.3 Proposed Solution

The proposed solution is a web-based HR platform that aims to transform the current manual recruitment process into an automated, efficient system. One key feature will be an advanced CV filtering functionality. For instance, if the HR manager needs to find candidates with Angular experience, the system will automatically filter and present profiles containing the word "Angular" in their CVs. This not only saves time but also ensures a more accurate match of candidate skills to job requirements. Other features of the platform will include a user-friendly portal for job application submission, online tests or quizzes for initial candidate assessment, and a streamlined process for scheduling and conducting interviews. The expected impact of this solution includes faster recruitment cycles, a better fit of candidates to job roles, and an overall improvement in the efficiency of the HR process at BeeCoders. By leveraging modern web technologies like React.js and Node.js, the platform will not only address the current limitations but also set a new standard in digital HR management.

1.3 Adopted Project Management Method

To realize and succeed in a project, it is important to follow a suitable methodology. It is a tool that helps us accomplish our project step by step, from planning to implementation, with a focus on efficiency and profitability.

Choosing a methodology to conduct a project allows all stakeholders to work effectively together, following clearly defined rules.

1.3.1 Definition of the Agile methodology

The Agile methodology have become a reference in project management, particularly in the field of software development. It offers many advantages such as its flexibility. It allows to adjust to changes in priorities or needs during the project even late in development. Indeed, these methods focus on collaboration and customer satisfaction. This allows for greater responsiveness and efficiency in the delivery of projects, to collaborate daily between customers and developers. It does make the job more efficient due to all those advantages.

1.3.2 Comparison of the Agile Methodology

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As we have said the Agile Methodology has been one of the important parts to make the project more efficient. There are many different methods so we will try to identify the differences between some of the top known agile development methods such as:

- Scrum
- Scrumban
- Kanban
- Extreme programming (XP)
- Feature-Driven Development (FDD)

Method	Advantages	Disadvantages
Scrum	<ul style="list-style-type: none"> - Motivation to finish the sprint. - All team members have the access to project progress. - The focus on quality. - Easy to reorganize. 	<ul style="list-style-type: none"> - Losing the track of the project - Not clear defining each role. No big picture of the project.
Scrumban	<ul style="list-style-type: none"> - Good for splitting projects into small chunks. - Everyone from the team has a view of progress. - Easier to spot bottlenecks. 	<ul style="list-style-type: none"> - Poor in documenting and pitfalls. - Not working in remote teams. - If issues are not documented rightly, possibility for repeating the same issues.
Kanban	<ul style="list-style-type: none"> - View of progress status (completed, in progress, in testing). - Possibility of limiting tasks Easy to track the duration of the tasks. - Continuous deliveries 	<ul style="list-style-type: none"> - Easy to misinterpret the information about the task. - No time frame. - Possible delays in every phase
XP	<ul style="list-style-type: none"> - Simple codes, easy to improve. - The whole cycle of XP is visible. - Constant testing makes the process more agile. - Uplifting the talent of teams. 	<ul style="list-style-type: none"> - More attention to code and less to design. - Not working in remote working teams. - If issues are not documented rightly, possibility for repeating the same issues.
FDD	<ul style="list-style-type: none"> - Clear picture of project scope - User-centric approach - Works good with long projects and large teams. - Decreased need for meetings. 	<ul style="list-style-type: none"> - Doesn't work good with small projects. - Dependence on lead developers. - No written documentation to the clients

1.3.3 Comparison of the Agile Methodology

The Scrum Agile framework is one of the best-known agile methods in the IT fields. Scrum uses an iterative and incremental approach and structure the project into sprints for a short period of time, most of the time the sprints last from two to four weeks. Scrum teams are based on defined roles (Product Owner, Scrum Master, developer team) and these roles ensure that the work is collaborative and well-organized. For our final project, we decided to adopt the Scrum agile method because of its many characteristics and advantages that correspond to the project we are carrying out.

a. Scrum Roles

Scrum defines three roles which are:

The Product Owner usually keeps in touch with the Product Managers and other stakeholders outside the team, S/He is responsible for the product of the project team and may have the following responsibilities:

- Managing the product backlog by prioritizing work
- Defining the product vision for the team
- Communicating with external stakeholders (customer, product manager) and translating their needs to the teams.
- Ensuring that the team is focused on the product needs by communicating and reviewing their progress.

The Scrum Master is responsible for ensuring that the Scrum team works as efficiently as possible in accordance with the Scrum values. S/He ensures that the team follows the plan, leads meetings and solves problems that the team may face. S/He is both a leader and a behind-the-scenes support, so we cannot define her/his tasks as they differ from organization to organization, from team to team, but the scrum master may have the following responsibilities:

- Leading the daily scrum meetings (also known as daily stand-ups).
- Leading sprint planning meetings.
- Managing obstacles that the team may face.

The development team consists of professionals who perform all the practical tasks. This means that the development team members may be software engineers, designers, writers, data analysts or any other role needed to achieve the sprint goals.

They usually work together to define the objectives and plans for achieving the sprint goals. Most of the time members of the development team do not have the same partial responsibilities because they do not have the same profile. For example, you may have a front-end engineer or a UX designer who can update your website but others such as a writer cannot, and vice versa. However, the development team may have common tasks:

- Assisting with sprint planning and goal setting.
- Contributing to expertise in programming, designing and product improvement.
- Using data to find best practice in development.

b. Scrum Artefacts

Scrum is accompanied by the creation of three essential artefacts which are the three pillars of the project:

The Product Backlog:

This is a list containing all the information requested from the customer, the user. The items on this list are organized by the product owner according to their priority. From most important to least important. This phase answers these two questions: Why this project is conducted and what the main purposes of this project are.

The Sprint Log:

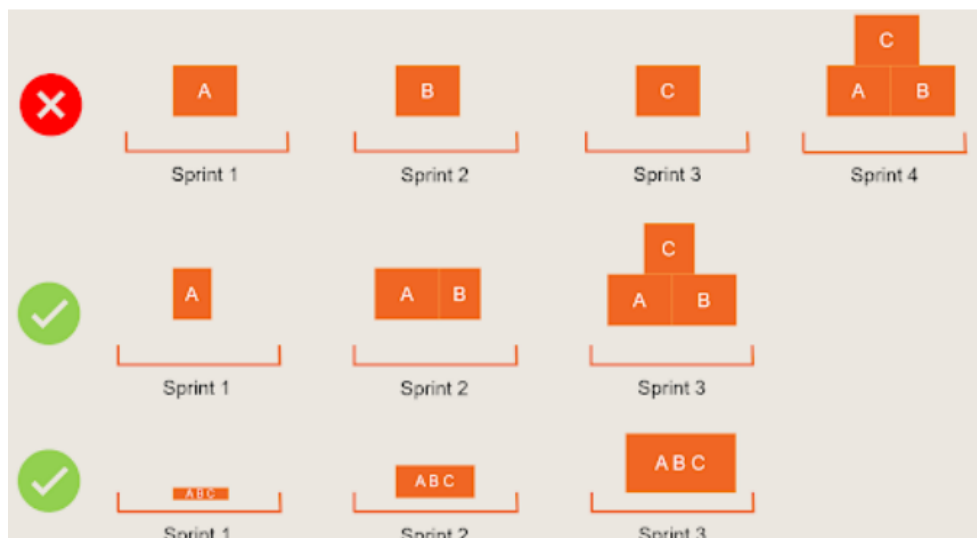
This artefact will contain all the user stories and bugs to be fixed that were agreed during the sprint planning. Each user story can be divided into different tasks during the development phase. All sprints have a start date and an end date. A sprint lasts three to four weeks. The sprint backlog contains at least the following three categories (to do, in progress, completed).

The Product Increments:

This is the most important artefact for the agile culture. During each sprint, the development team completes a product increment. The sum of the product increments allows progress towards the product goals.

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c. Scrum formal inspection

Scrum offers four formal opportunities for inspection and adaptation:

Sprint planning:

Carried out by the entire Scrum team, this is a supervised meeting that is triggered at the beginning of each sprint. They review the product backlog; the team determines the overall objective of the sprint and prioritizes the items to be worked on.

Daily Scrum:

Once everything is settled and the team begins working on the sprint, team members meet in the same location each day for about 15 minutes to share a brief update on their individual progress and discuss what they plan to do in the coming day.

Sprint Review:

After completing the sprint, the team should meet to review how it went. This is a very important part of the scrum inspection. Developers share feedback on their tasks and a demo of the product can be shown to highlight new features. The product owner validates the work of the sprint and updates the backlog for the next cycle.

Sprint Retrospective:

When it comes to adapting to Scrum, the sprint retrospective is a key event. Here team members reflect on how to improve their overall process. They identify the obstacles they have encountered previously and discuss how to adapt and overcome these problems in future sprints.

1.4 Conclusion

This project marks a significant step in the digital transformation of HR processes at BeeCoders, showcasing the potential of modern web technologies in enhancing recruitment efficiency. By integrating advanced features like CV filtering and online interviewing into our web-based HR platform, we not only address current inefficiencies but also pave the way for future innovations in HR management. Embracing Agile methodologies, particularly Scrum, has been instrumental in achieving a flexible, user-centric development approach, aligning with BeeCoders' commitment to innovation and excellence.