Backend Development

Cruz Arredondo José David. UTT. January 4, 2023

Summary - **Backend development uses programming languages like Python, JavaScript, Ruby, Java, and frameworks tailored to these languages. It focuses on the unseen aspects of an application, ensuring it functions properly and supports the frontend user experience.**

I. INTRODUCTION

Back-end developers are the experts who build and maintain the mechanisms that process data and perform actions on websites. Unlike front-end developers, who control everything you can see on a website, back-end developers are involved in data storage, security, and other server-side functions that you cannot see.

Since the late 80s and 90s, the internet has transformed the way humans access information, and web development has continued to evolve. Its central importance to our digital world means web developers are in high demand. Fortunately, anyone can learn the technical skills needed to be front-end, back-end, or full-stack (both front- and back-end) developers.

II. CONCEPT

Back-end development means working on server-side software, which focuses on everything you can't see on a website. Back-end developers ensure the website performs correctly, focusing on databases, back-end logic, application programming interface (APIs), architecture, and servers. They use code that helps browsers communicate with databases, store, understand, and delete data.

On a team, back-end developers collaborate with front-end developers, product managers, principal architects, and website testers to build the structure of a website or mobile app. Back-end developers must be familiar with many kinds of tools and frameworks, including languages such as Python, Java, and Ruby. They make sure the back-end performs quickly and responsively to front-end user requests.

Backend development refers to the creation and maintenance of the server-side of web applications, software, or systems. It involves managing the behind-the-scenes functionality, databases, and server operations that enable the frontend (the part of the software that users interact with) to function properly. [1]

III. MAIN TASKS OF A BACKEND DEVELOPER

Back-end developers are required to have technical expertise, analytical thinking, and excellent collaboration skills. As a back-end web developer, you should be able to work independently to design the web infrastructure.

- **Build and maintain websites:** A back-end developer's main responsibility is to use various tools, frameworks, and languages to determine how best to develop intuitive, user-friendly prototypes and turn them into websites. This requires an understanding of cross-platform functionality and compatibility.

- **Write high-quality code:** To produce sustainable web applications, developers must write clean and easily maintainable code.

- **Perform quality assurance (QA) testing:** Create and oversee testing schedules to optimize user interface and experience, ensuring optimal display on various browsers and devices.

- **Assess efficiency and speed:** Once a website is up and running, and during updates and edits, developers need to assess its performance and scalability, adjusting code as necessary.

- **Troubleshoot and debug:** Be able to troubleshoot issues and resolve them, while communicating them to project managers, stakeholders, and QA teams.

- **Train and support:** Maintain workflows with client teams to ensure ongoing support, along with leading training and mentorship for junior developers.

IV. PROGRAMMING LANGUAGES MOST USED

In application development, the very first thing that one should do is select the backend programming language and determine how it affects the whole application development project.

- Programming languages

- Python
- PHP
- JavaScript
- Ruby
- Java
- C#

- Frameworks

- Laravel
- Django
- Spring
- Ruby on Rails
- Meteor
- Node.js

- Databases

- MongoDB
- MySQL
- Oracle

The choice of language often depends on factors like the specific project requirements, performance needs, team expertise, and the ecosystem of libraries and frameworks available for that language. Additionally, some languages have better support for certain types of applications or industries, influencing their adoption in backend development. [2]

## V. DIFFERENCES BETWEEN BACKEND AND FRONTEND

Front end and back end are broad terms that logically group the different technologies and software layers of any application. The front end focuses on the aspects that users can see. On the contrary, the back end is everything that makes the application work.

You can think of the front end as the body of a car and the back end as all the machinery inside. A carefully designed car will only perform optimally if the internal machinery is working properly. However, certain aspects of the exterior design also contribute to speed and performance. Likewise, the front end and back end of the application should be designed consistently for best results.

Full stack development aims to create responsive, efficient and functional applications. Front end and back end developers have different goals for creating the final application.

Front end developers aim to develop a positive user experience, optimize the application for accessibility and performance, and create responsive designs. Your main development goals are to ensure that the front end is easy to interact with, is well designed, and remains responsive across different platforms and devices.

Back-end developers create and subsequently maintain the server-side operations of an application. Its main development goals are to create a reliable architecture that performs the functions of the application accurately and efficiently. Its goal is to meet user requirements while meeting all security and cost considerations. [3]
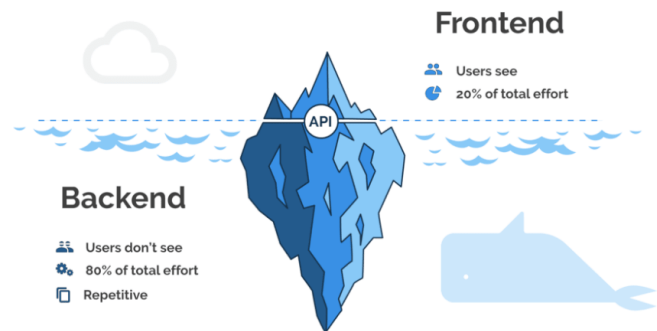
VI. CONCLUSION

In conclusion, everything that a backend developer can do is quite interesting, although generally they are not fully recognized in different areas because the first thing the public sees is the frontend.

Both the backend and the frontend are extremely important since it is the "brain" of a program or a web application, without it, no program, page or application would work.

VII. REFERENCES

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