**ASSIGNMENT**

1)Comparison of various enterprise application development technology stacks (development, engineering, deployment, monitoring).

Mobile Enterprise App Development: Introduction

Some common questions regarding software development stacks that we usually stumble upon are: Which technology stack should we use for mobile enterprise app development? How to choose the right technology stack that suits specific business needs? What are the essential components before selecting a particular enterprise technology stack over the other?

We decided to answer these questions in a detailed blog to help you understand the nitty-gritty when choosing the best tech stack for developing an enterprise-level application. Let’s get started!

**What Is A Technology Stack In Enterprise Application Development?**

An enterprise technology stack is essentially a set of software tools, programming languages, frameworks, databases, front-end tools, back-end tools, and applications connected via APIs. They come together for[**mobile enterprise app development**](https://markovate.com/enterprise-app-development) and build digital products like mobile, web apps, and websites. It is also called a solution stack.

Simply put, it is an ecosystem of data, programs, and tools combined to create and run a specific application or digital product. Tech stacks are typically composed of layers of components and/or servers used to build applications and solutions.

Before the popularity of SaaS products and services, technology stacks were relatively simple: Linux, Apache, MySQL, PHP (LAMP), a PHP-based web application development standard, and WAMP (Windows, Apache, MySQL, PHP for those who preferred Windows to Linux).

However, product teams and engineers now have access to a wealth of tools and software development stacks, especially for a progressive web app. That helps them build and maintain the perfect product for their market segment. For example, a company in the early stages still finding traction might choose low-cost, flexible options they can adjust later. At the same time, another might select technology that maximizes scalability to serve enterprise customers.

**Mobile Enterprise App Development: Technology Stack Components**

Any app has two main components: the client (front end) and the server (back end). There are layers for mobile enterprise app development. They are built on top of each other, creating a stack.

**Frontend Technology Stack:**

Frontend or client-side refers to everything users see on their screens and where they interact with the application. These are the three main front-end technologies:

* HTML (the markup language)
* CSS (the style-sheet)
* JavaScript (the scripting language)

**Backend Technology Stack:**

The backend or the server side is the one that is not visible to a user. But its programming languages create logic and functions as the backbone of websites and applications. The backend consists of frameworks that enable developers to save time. They provide their customers with vetted versions of commonly used features (user authentication, data access).

Now that we have covered the basics of technology stacks let’s move on to some popularly used technology stacks available for mobile enterprise app development.

## Mobile Enterprise App Development: How to Choose The Right Enterprise Solution

The important and the most sought-after question remains, ‘How to choose the best tech stack for your enterprise solution?’ Let us explain that in this section.

Depending on which set of frameworks suits your application requirements and needs, the choice of your tech stack can influence your project. Hence, your project is not a single deployment but a set of independent deployable components and services written in separate programming languages. To simplify the process of choosing the best tech stack for your enterprise software development, we have listed down some key factors to consider while selecting the tech stack for your next application:

### 1. The Type of Project

Your product or app development type also decides when you choose your tech stack. If the size of your project is small and has to be delivered in less time, the app development will include a simpler process and options available with built-in features and templates.

On the other hand, if it is a mid-sized or large project, you would require a combination of frameworks and technologies that work best, enabling seamless functioning and integration with enough time for development for various platforms.

### 2. Scalability

The possibilities of scalability of your app development project grow with an approach of feature enhancement and analysing feedback. Choosing the tech stacks built for testing, which allow several improvements, will be the best tech stack for you in terms of your enterprise product growth. This stage usually comes after an MVP launch and customer feedback. It enables analysing the gaps in features of the application and further helps in an increase in ROI.

In short, utilizing MVP allows scaling a product with upgraded features and functionality compared to a direct launch of the final product.

### 3. Expertise

Your development team’s expertise also influences the choice of the best tech stack for your enterprise applications. A development team is responsible for the decision-making, analysing, and deploying of your business’s best technology and frameworks. Thus, an expert team is equipped to deliver innovative solutions to counter issues in the app development process.

This will also allow you to follow a strategic development approach to ensure quality in each app development module.

### 4. Maintenance

While developing an application, it should be flexible to maintain and manage. For example, if the codes are lengthier, they will take longer to process and manage. Fixing bugs should be easier if your development process is strategic and easy to maintain. Hence, choosing the right tech stack should be easier to manage and maintain in the long run.

### 5. Cost of Development

The cost of your app development is also an important deciding factor when choosing a tech stack. While most tech stacks are available as open-source today but for enhanced functionalities and features, you have to buy the licensed version.

Analysing your budget and choosing the best tech stack accordingly is an important step. You should consider in-built features as well as premium features. Then compare them in terms of your project requirements and budget to choose the best tech stack available for your mobile enterprise app development.

## Conclusion

Finally, choosing the right software vendors and product development company is important if you are outsourcing app development. With the right tech stack, your product can be easier to build, easier to update, and can evolve in step with your customers’ needs.

As an [**enterprise app development**](https://markovate.com/enterprise-app-development) company, our team of experts follows a strategic approach to delivering robust apps tailored to particular project needs and requirements using modern and up-to-date technologies. We cover important elements from conceptualizing, ideation, evaluation, MVP development, features enhancement, product launch, and branding.

With enterprises build highly scalable, high-performant apps that add value to the business. A team of specialists will manage mobile app development for you. Our experts strategically analyse your project information and assist you in determining the best tech stack, new feature priority, product development, branding, etc.

If you have more questions about choosing a tech stack for your app development, let us know your project information to get expert assistance.

2)Security architecture and best practices in enterprise application programming.

# **Data Security**

Data is the value of any business in the modern world. Securing data is critical to the success of any company. We can identify 3 main aspects of data security in enterprise software systems.

* Securing data at rest
* Securing data in transit
* Data privacy

## Securing data at rest

Business-critical data is typically stored in a database or a file system. To prevent anyone else from accessing this data, we can use techniques such as encryption to secure data at rest. In encryption, we transform the content to a form that is unreadable without a secret key to decrypt the content. Another technique used to secure data at rest is tokenization in which the actual data is represented as a token that is unusable without context. As an example, you can represent a credit card number with a token so that other people cannot recognize the credit card number other than the system which is capable of detokenizing the data. Additionally, the database system or the file server can be protected with advanced security measures such as strong authentication.

## Securing data in transit

The data stored in the storage systems need to be retrieved by the user via the applications or systems. Usually, data transmits through the network and we need to prevent network-based attacks such as man-in-the-middle attacks. The solution for securing data in transit is to use transport layers security protocols such as SSL and TLS for the communication of data from the data store to the consumer. By implementing a proper secure key and certificate management system, we can implement transport layer security and encrypt the data while in transit.

## Data privacy

Another critical aspect of data security is privacy. What this means is that the data that we collect from the users (e.g. customers, partners) needs to be used according to the data privacy laws applicable to the specific region that these users are pertaining to. As an example, for European countries, there is a data protection law called GDPR (General Data Protection Regulation) which all organizations need to follow when dealing with data related to users from that region.

# Application security

Enterprise software systems consist of 10s, 100s, or even 1000s of different applications that are developed by entirely different vendors including in-house development teams. The users who access these applications need to be provided with the best possible user experience without compromising security. To achieve that level of security for applications, we can follow the approaches mentioned below.

* Build a strong identity foundation
* Adhere to security best practices and automate them
* Follow zero-trust architecture for application security
* Prepare for security events

## Build a strong identity foundation

A typical enterprise may have applications that involve interactions with different types of users including

* Customers
* Employees
* Partners

We need to implement proper security measures depending on the category of users. There are different types of security approaches that we can follow based on these user profiles. Some common aspects are

* Business to Customer (B2C)
* Business to Employee (B2E)
* Business to Business (B2B)

It is important to implement the proper security measures on the applications depending on these use cases.

Another key aspect here is to understand the requirements for authentication, authorization, and user management within the enterprise and adhere to standard methodologies to implement these aspects so that you don’t need to worry about vendor locking or technical debt in the future.

## Follow zero-trust architecture

The security teams recommend using the “zero-trust architecture” where no system is considered trustworthy when communicating with another system for enterprise applications. It eliminates the implicit trust that was there in the trusted subsystems model and continuously validates every interaction within the system. It uses the mantra of “never trust, always verify” in communication between systems in an enterprise. There are 3 main principles of zero-trust architecture that need to be considered when implementing it. Those are: 1) All entities are untrusted by default

2) Least privilege access is enforced 3) Comprehensive security monitoring is implemented