

# Mobile app architecture: components and factors

Today, due to the development of the mobile industry sector, companies have the opportunity to increase their businesses' value by implementing mobile applications. But until you get a successful application, it is important to focus from the beginning on its architecture. Building clearly defined mobile app architecture it's not an easy process, it heavily relies on a very meticulous plan, just like building a city. Due to this, you'll save time, stress, effort, money because ahead a well-designed app's architecture makes it easier for you to modify, test, and debug.

## ARCHITECTURE ...? WHAT IS THIS?

Being more explicit related to app architecture, we can define this as a roadmap and a detailed guide app of how the mobile app is supposed to be created. It consists of structural elements and interfaces, connections between selected elements, the general style of the program, and several layers, including:

Presentation Layer	Business Layer	Service Layer	Data Layer
contains UI elements along with the parts processing them.	consists of workflows, business entities, and components.	is made up of service interfaces and message types.	involves data utilities, data access components, and service agents.

Once you have decided to create an application, invest time and money in its architecture. Focus on its convenient functionality, rapidity, safety, and excellent structure. Firstly, start by checking key principles that a mobile app architecture should include:

1. **Efficiency.** The application performs the assigned tasks and performs the functions in any conditions. The system is efficient, reliable, and can handle all loads.
2. **Flexibility.** The solution you choose is easy to change and there are fewer mistakes. You can change one element, and this will not be fatal to other components.
3. **Extensibility.** You can add as many features as you like to your application if required.
4. **Scalability.** Development and addition time is reduced. A good architecture allows you to streamline development into multiple parallel threads.
5. **Testability.** You are able to test each component separately, to allow future consistency to diverse variables.
6. **Manageability.** You monitor the workability, functionality, security, and efficiency of the system.
7. **Reusability.** The elements and structure can be reused in other projects.

8. **Maintainability.** Due to market conditions and consumer behavior continuous changes, architecture should always have the capacity to be changed, corrected, modified, and improved.
9. **Comprehensibility.** The code should be understandable to as many people as possible. A lot of people are working on the application. A good architecture allows beginners to quickly understand a project.
10. **Performance.** Ensure quick response to users' intent/request during app usage. Therefore, we provide amazing customer satisfaction, without resorting to the app uninstalling and customer loss.
11. **Security.** The architecture should be maximum robust to fully secure and protect user data and data which is used by the app.

Then, based on the target audience, platforms it'll be deployed on, features and functionality, correctly choose the right type of your mobile application:

- **NATIVE APP**

is a program for iOS, Android, and other platforms. Native means the app is built for one platform.

- + efficiency due to compliance with all the requirements of the selected category of devices;
- + more secure;
- + has better performance as compared to a hybrid app;
- + interact with other native APIs;
  
- + doesn't depend on plugins and WebViews;
- + perform much faster as compared to a hybrid app;
- + quick access to new features;
- + better user engagement;
  
- two separate codebases and databases – one for Android and the other one for iOS;
- require installation;
- difficult to run SEO campaigns and strategies;
- costs (time/budget).

- **HYBRID APP**

a site optimized for use on a mobile device.

- + reduce development time and costs;
- + leverage cross-platform capabilities;

- + work on multiple platforms;
- + less time-consuming to create;
- + automatic updates;
- + easy maintenance;

- requires a constant Internet connection, because it is located on a separate server in the network.);
- limited user interface;
- depend on the browser's speed.

and:

- bandwidth scenarios;
- user interface;
- navigation methods;
- the device types:

<b>ANDROID APP ARCHITECTURE</b>	<b>iOS APP ARCHITECTURE</b>
<p>For the Android mobile architecture app, a good solution is the Clean Architecture because it makes your app more independent of frameworks, databases, layers, and more. In other words, your developers will not be tied to a specific framework or database. Also, we use, MVVM, MVP, MVI.</p> <p>Deciding architecture type, pay heed to android frameworks, libraries, app developing concepts, app components, and fragments to provide an ideal approach and an outstanding user experience.</p>	<p>For iOS, you may find suggestions from Apple to use the MVC (Model-View-Controller), MVVM architectural pattern for UIKit, but again, you need to understand and carefully analyze every detail to realize which kind of architecture will make the best version of your app.</p>

We at DAS Solutions design mobile applications using the following methods, depending on the project objectives:

### **MONOLITHIC ARCHITECTURE**

The necessary logic is stored on the server, and all the necessary information for the server is stored in the database. Such applications are very simple and require relatively little development time. But in the long run, applications are bound to change because they have to fit new platforms, gadgets, and operating systems.

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## **MICROSERVICES ARCHITECTURE**

This is typical for cloud-native applications, which are now popular due to the advantages that cloud environments provide for business. It is a method of building independently developed and distributed applications, each of which runs as one or more isolated processes.

For any changes, even the smallest, monolithic applications require rebuilding and deploying the entire monolith. Whereas microservices are broken down and placed independently of each other. This means that microservices offer a completely independent approach, with each individual component performing a different function for the entire system to work.

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## **SERVICE-ORIENTED ARCHITECTURE**

SOA is independent of the programming languages, platforms, or protocol specifications used for services developed. Also, an important aspect of SOA is high flexibility, which is achieved due to the ability to quickly adjust business logic – a change made to a business function will eventually affect all the necessary applications.

With the increasing complexity of applications, some modules are moved to separate hardware parts and services. Modules here sometimes hold their own databases and reside on separate devices. This has its pros and cons.

Such an architecture requires serious investments at the start, but with a competent approach, costs are reduced at subsequent stages of development. Service-oriented architecture is good for large companies.

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Before developing your mobile app architecture, consider some important factors and elements like:

### **✓ Device Types**

- Screen resolution;
- Screen size;
- CPU Features;
- Storage Space;
- Memory;
- Availability of the development framework.

### **✓ Bandwidth Scenarios**

- with an internet connection (3G, 5G);
- offline connection.

## ✓ **Navigation Methods**

- Stacked navigation bar;
- Navigation bar (top and bottom);
- Tag driver;
- Modular controller;
- Single view;
- Scroll view;
- Gesture-based navigation;
- Search-driven navigation.

## ✓ **User Interface (UI)**

### ✓ **Real-Time Updates vs Push Notifications**

It might look difficult to plan the architecture app, and it is we confirm, this is why we recommend to work with an expert software development company.

DAS's architects are experienced and qualified specialists who work in tandem with programmers, coming with advice to developers related to the app and giving instructions on how to create an app. At the same time, the architect is looking for compromises between customers, managers, developers.

We know how to create a fast and reliable architecture, providing a unique user experience. Designing mobile applications is our specialty. Contact us by email and let's speed up your mobile app architecture.