VAN HIEN UNIVERSITY
FACULTY OF INFORMATION TECHNOLOGY

MULTIPLATFORM PROGRAMMING

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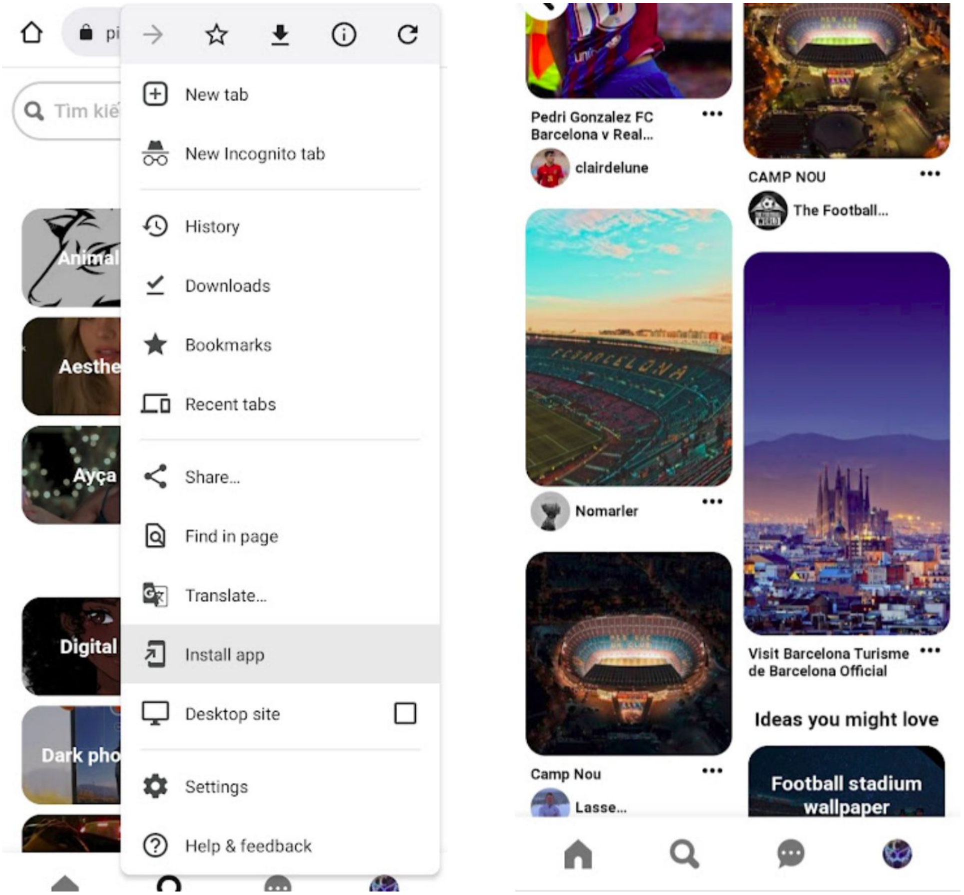
1. Introduction

1.1 What is multiplatform programming?

1. Introduction

1.1 What is multiplatform programming?

Pinterest has been using PWA.



1. Introduction

1.2 Benefits and Drawbacks

Benefits:

- Simplifying management.
- Lower cost.
- Consistency in UI/UX.
- Wider market reach.

1. Introduction

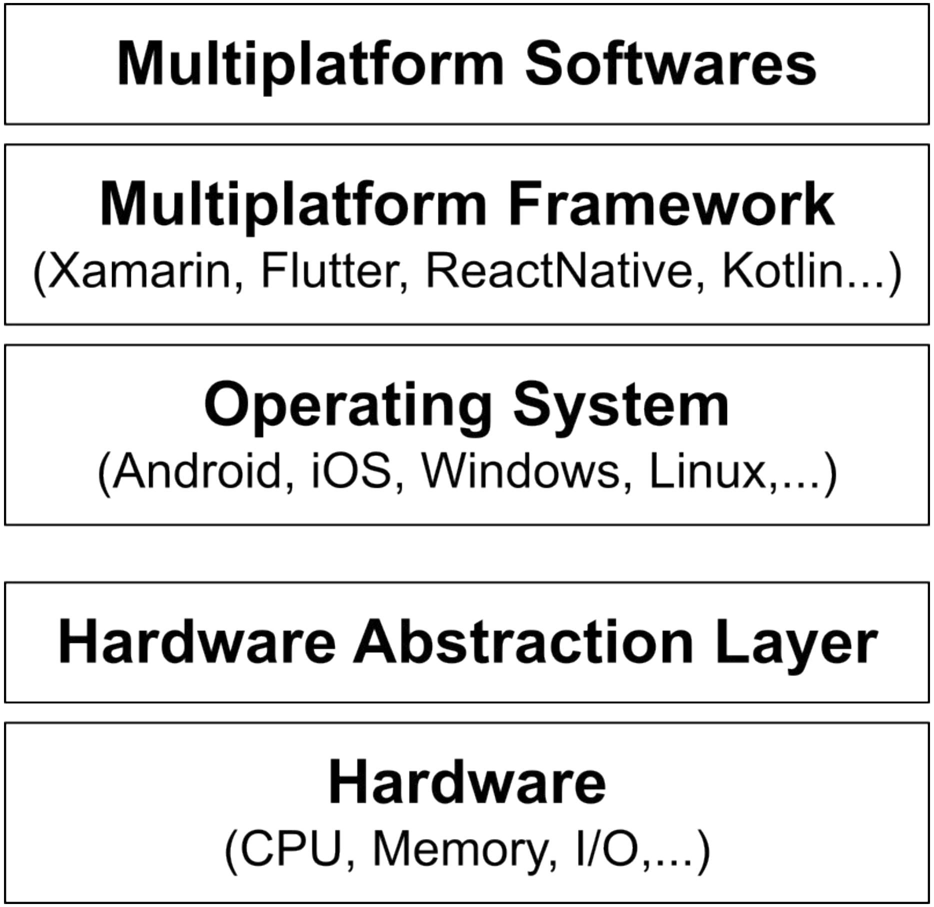
1.2 Benefits and Drawbacks

Drawbacks:

- Limited access to native features
- Performance challenges.
- Long wait for update integration.

2. Mult. Software Architecture

2.1 High-level Overview



Multiplatform Softwares

Multiplatform Framework
(Xamarin, Flutter, ReactNative, Kotlin...)

Operating System
(Android, iOS, Windows, Linux,...)

Hardware Abstraction Layer

Hardware
(CPU, Memory, I/O,...)

2. Mult. Software Architecture

2.2 Computing Platforms

2.2.1 Hardware & Software

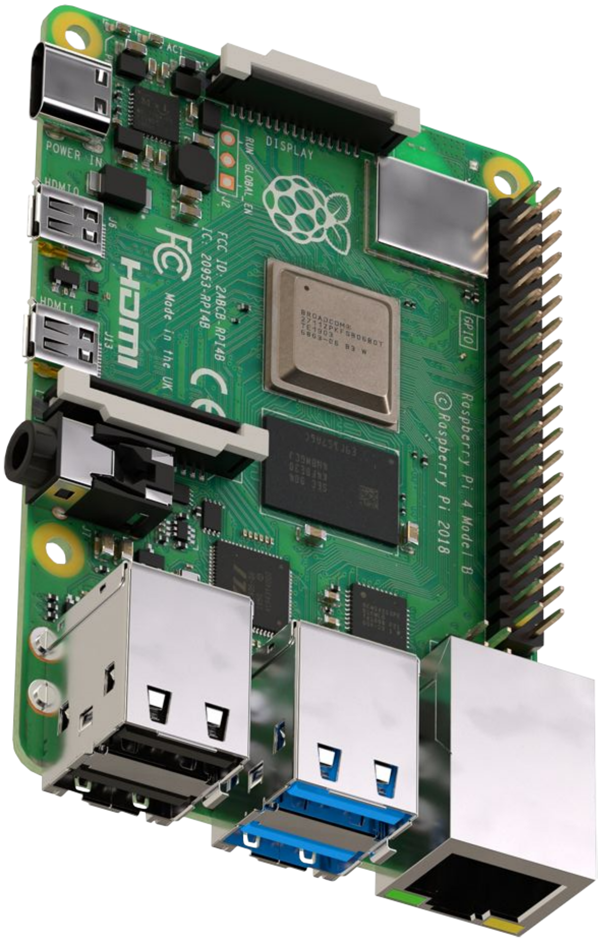
- Hardware has its own machine language and involves a type of processor.
- Operating system is built on a hardware platform.

2. Mult. Software Architecture

2.2 Computing Platforms

2.2.1 Hardware & Software

Raspberry Pi—an embedded system running Linux. It is a combination of hardware and software.

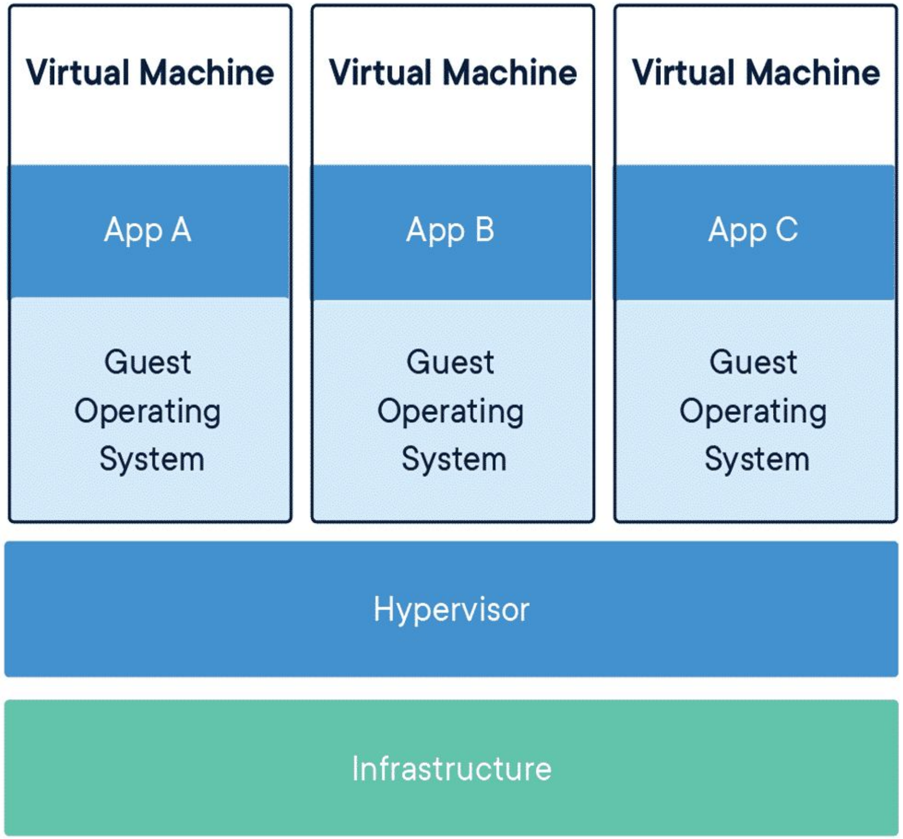


2. Mult. Software Architecture

2.2 Computing Platforms

2.2.2 Virtual Machine

VM includes a full copy of an OS, and necessary things to run software in it.

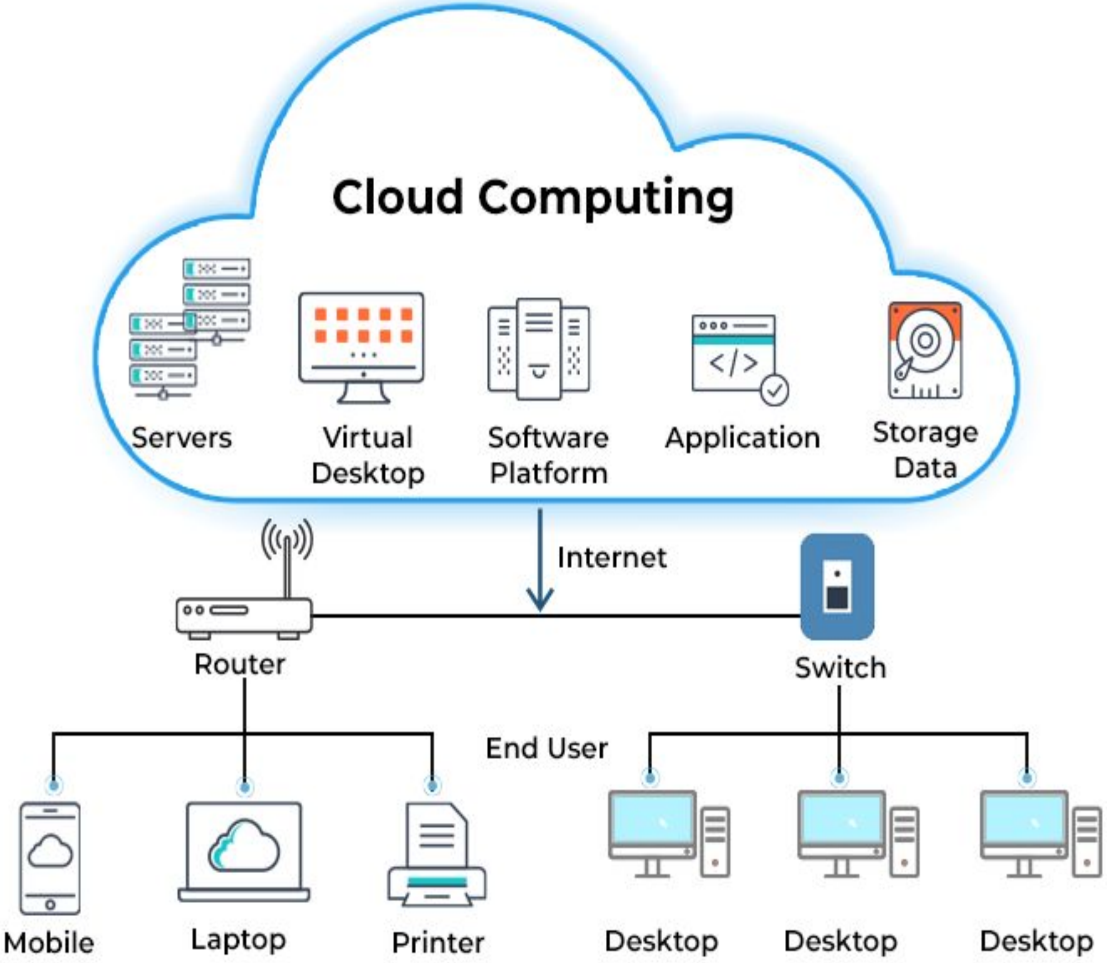


2. Mult. Software Architecture

2.2 Computing Platforms

2.2.3 Cloud

Cloud computing plays a central role in many applications.

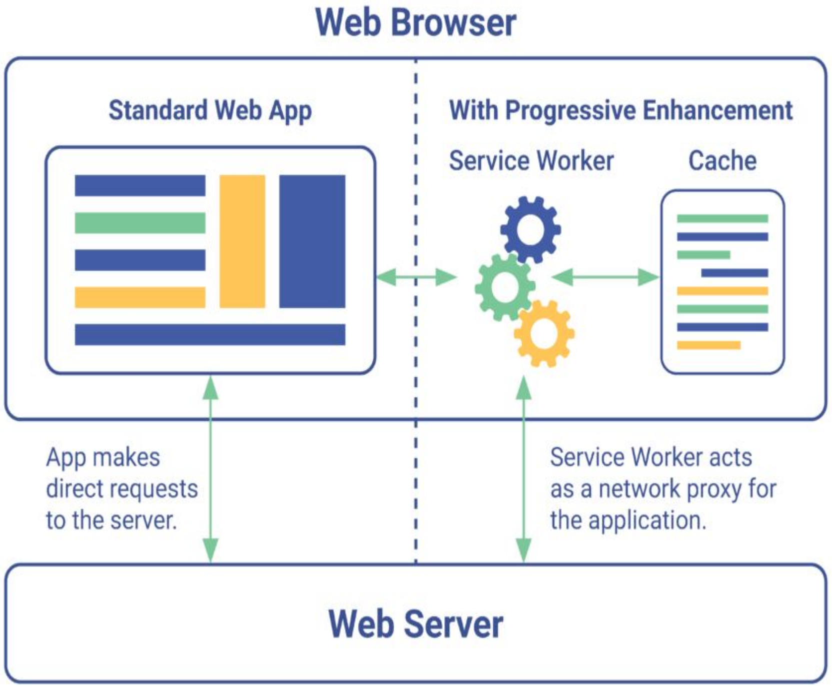


2. Mult. Software Architecture

2.3 A Few Implementations

2.3.1 Progressive Web Applications

PWAs transform a website into something like a native app.


Web Browser
Standard Web App
With Progressive Enhancement
Service Worker
Cache
App makes direct requests to the server.
Service Worker acts as a network proxy for the application.
Web Server

2. Mult. Software Architecture

2.3 A Few Implementations

2.3.2 Scripts and Interpreted Languages

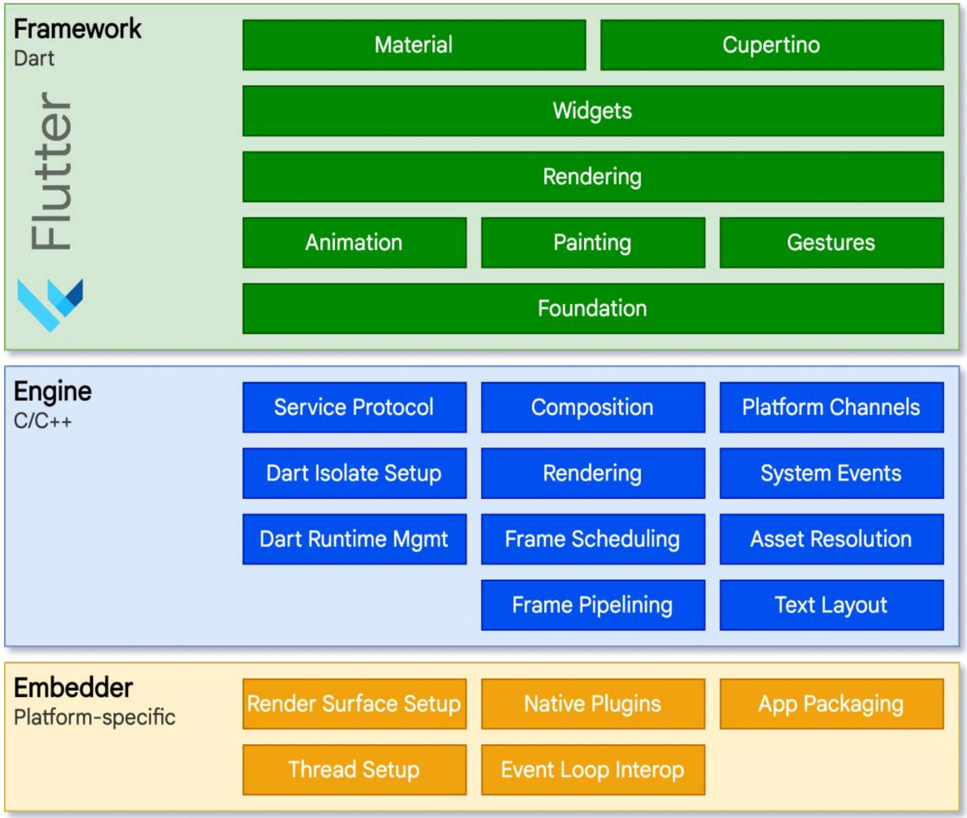
Interpreted languages are compiled at execution time to match the platform they are executed on (e.g., Python, Perl).

2. Mult. Software Architecture

2.4 Some Mult. Development Tools

2.4.1 Flutter

Flutter engine is mostly written in C++ and supports the primitives necessary to write multiplatform app.



Framework
Dart

Material | Cupertino
Widgets
Rendering
Animation | Painting | Gestures
Foundation

Engine
C/C++

Service Protocol | Composition | Platform Channels
Dart Isolate Setup | Rendering | System Events
Dart Runtime Mgmt | Frame Scheduling | Asset Resolution
Frame Pipelining | Text Layout

Embedder
Platform-specific

Render Surface Setup | Native Plugins | App Packaging
Thread Setup | Event Loop Interop

2. Mult. Software Architecture

2.4 Some Mult. Development Tools

2.4.2 Kotlin

Kotlin is a kind of Java with some added features.

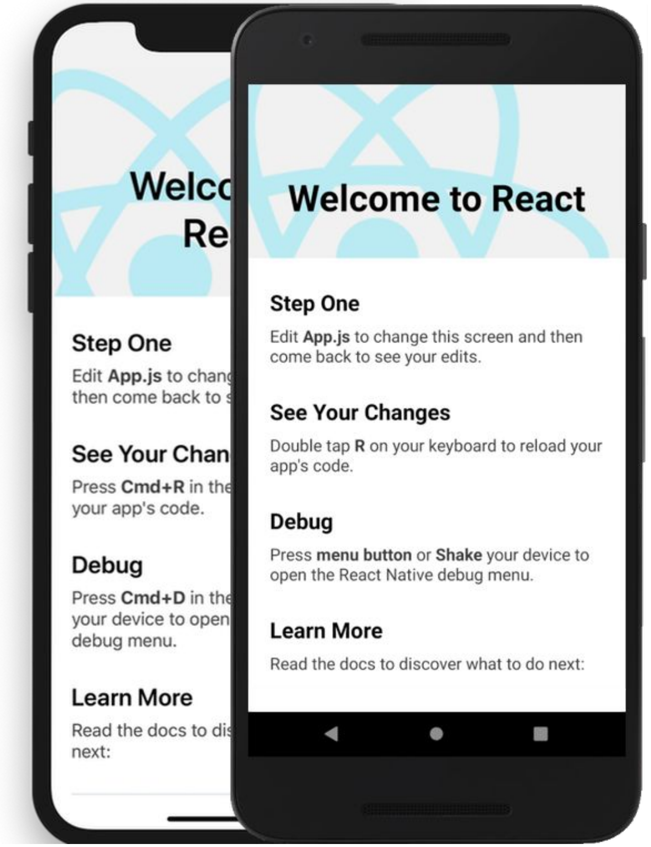
It targets the JVM, JS, and native code.

2. Mult. Software Architecture

2.4 Some Mult. Development Tools

2.4.3 React Native

The application written in React will render using real mobile UI components.



Welco
Re

Step One

Edit **App.js** to chang
then come back to s

See Your Chan

Press **Cmd+R** in the
your app's code.

Debug

Press **Cmd+D** in the
your device to open
debug menu.

Learn More

Read the docs to dis
next:

Welcome to React

Step One

Edit **App.js** to change this screen and then come back to see your edits.

See Your Changes

Double tap **R** on your keyboard to reload your app's code.

Debug

Press **menu button** or **Shake** your device to open the React Native debug menu.

Learn More

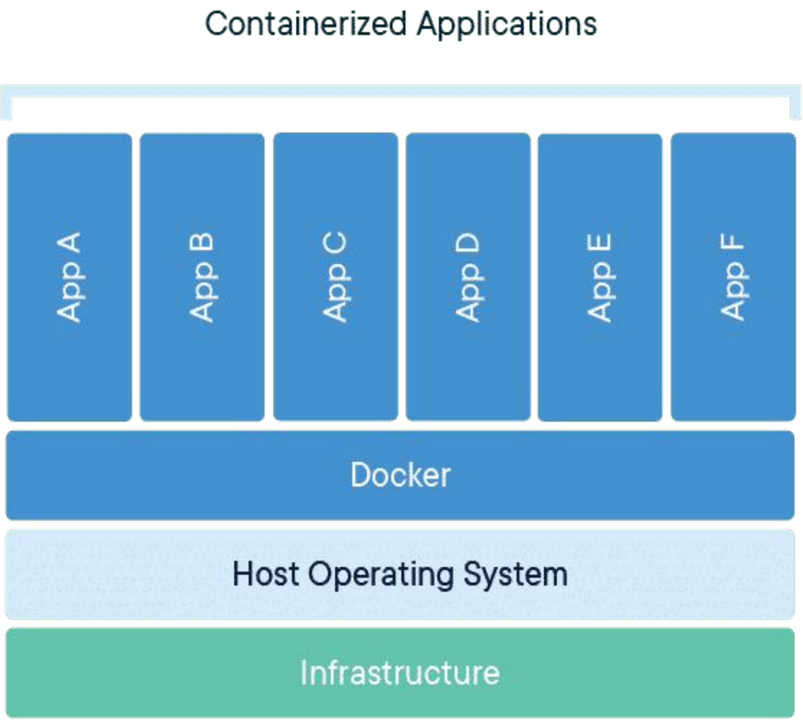
Read the docs to discover what to do next:

2. Mult. Software Architecture

2.4 Some Mult. Development Tools

2.4.4 Docker

Containers can run on the same machine, each running as isolated processes.



3. MS Adoption & Its Future

3.1 Background

Software was only compatible with certain kinds of hardware and operating systems.

3. MS Adoption & Its Future

3.2 The Current Landscape

Multiplatform softwares have become more widely available with the rise of desktop and mobile platforms.

3. MS Adoption & Its Future

3.3 The Trends

- Smoother and Lighter app.
- More consistent with various device.

CONCLUSIONS

- Maintaining one codebase and deploying it to multiple platforms.
- Saves time & labor & budget, but not suitable for sophisticated software.
- Many technologies and frameworks to choose.
- Worth considering because it simplifies the development process.

DISCUSSIONS

- Stably handling OS update?
- Multiplatform software market size?
- Users’ satisfaction?

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