UNIT 15   APP BASED COMMERCE

Structure

15.0   OBJECTIVES

After studying this unit, you should be able to:

- understand what is an App and its various types;

- describe various steps for App development;

- know about various App development frameworks;

- know about various types of App store;

- know about different Apps for various domains and segments;

- Explain and plan a framework for a business App.

15.1   INTRODUCTION

In the present time, with the rapid technological disruption, mobile phones have become an inevitable part of human life. Even though the primarily function of mobile phones is telecommunication but with the technological upfront they have made many things possible which were unimaginable earlier. Now the things have changed with the advent of smart phones, each person today owns his/her own mobile phone. Accessibility to smart phones has made our life easier in many ways. The main advantage of mobile phones are its portability, you can carry them in your pockets wherever you go. Smart phones introduced a new face to service sector with the invention of mobile apps. Mobile apps basically are applications designed to perform a specific task at the user's fingertip. The services that mobile apps and smart phone provide are plenty.

15.2   WHAT IS AN APP?

An app is short form of a term called "application," it is basically a type of software that can be installed and run on a computer, tablet, Smartphone or other electronic devices. An app is simply a piece of software that you can get access to and use through the internet. A mobile application, also referred to as a mobile app or simply an app, is a computer program or software application designed to run on a mobile device such as a phone, tablet, or watch.

Fig 15.1: App Icon in a Mobile or smart phone

Many apps are also available for mobile devices and even for TVs. We will discuss about it in a more elaborative manner in coming heads of the unit, some are useful for desktop and some are useful for Mobile.

15.2.1 Classification of Apps

Mobile applications may be classified by numerous methods. A common scheme is to distinguish native, hybrid, and web-based apps. A brief about all these is give below:

Fig 15.2: Native, Hybrid & Web Apps

1. **Native Apps:** Native apps are developed for their particular platform, taking full advantage of the software and the operating systems' features. These apps can directly access the hardware of the device such as the GPS, camera, microphone, etc. so they are faster in execution, which ultimately results in better user experience. All apps targeted toward a particular mobile platform are known as native apps. Therefore, an app intended for Apple device does not run in Android devices. As a result, most businesses develop apps for multiple platforms. While developing native apps, professionals incorporate best-in-class user interface modules. This accounts for better performance, consistency and good user experience. Users also benefit from wider access to application programming interfaces and make limitless use of all apps from the particular device. Further, they also switch over from one app to another effortlessly. The main purpose for creating such apps is to ensure best performance for a specific mobile operating system.

2. **Hybrid Apps:** The concept of the hybrid app is a mix of native and web-based apps. Apps developed using Apache Cordova, Xamarin, React Native, Sencha Touch and other similar technology fall into this category. These are made to support web and native technologies across multiple platforms. Moreover, these apps are easier and faster to develop. It involves use of single code base which works in multiple mobile operating systems. Despite such advantages, hybrid apps exhibit lower performance. Often, apps fail to bear the same look-and-feel in different mobile operating systems.

3. **Web-based Apps:** Web-based applications are a particular type of software that allows users to interact with a remote server through a web browser interface. It works on any browser whether it is chrome, opera or Samsung internet browser and the users are not obliged to download from the app store. These apps have seen a huge increase in popularity in recent years, replacing desktop applications and becoming a crucial instrument for small and large businesses around the world. A web-based app is coded in HTML5, CSS or JavaScript. Internet access is required for proper behavior and user-experience of this group of apps. These apps may capture minimum memory space in user devices compared to native and hybrid apps. Since all the personal databases are saved on the Internet servers, users can fetch their desired data from any device through the Internet.

15.2.2 Types of Apps

1. **Desktop Applications:** There are countless desktop applications, and they fall into several categories. Some are more full featured (like Microsoft Word), while others may only do one or two things (like a clock or calendar app). Below are just a few types of applications you might use.

   ● **Word processors:** A word processor allows to write a letter, design a flyer, and create many other types of documents. The most well-known word processor is Microsoft Word. We had elaborately discussed about this application software in our previous course (BCOS-184: Computer Application in Business) in an elaborative manner.

   ● **Media players:** If you want to listen to MP3s or watch downloaded movies, you'll need to use a media player. Windows Media Player and iTunes are popular media players which are also covered in our previous unit 14 in a much more elaborative manner.

2. **Mobile Apps:** Desktop and laptop computers are not the only devices that can run applications. You can also download apps for mobile devices like smart phones and tablets. Here are a few examples of mobile apps.

   ● **Gmail:** Gmail is used to view and send emails from your mobile device. It's available for Android and iOS devices.

   ● **Instagram:** Instagram allows to quickly share photos with your friends and family. It is available for Android and iOS.

   ● **Duolingo:** With a combination of quizzes, games, and other activities, Duolingo app can help learn new languages. It is available for Android and iOS.

15.3 STEPS FOR APP DEVELOPMENT

Development of an app is a comprehensive task involving various steps, a brief of all the important steps which needs to be followed while developing any app is described below:

15.3.1 Defining Mobile App Objectives

To clearly set and define the objectives for which App is being made is an important part of the App making process. Following points are important to consider before App designing is defined -

- What is the main purpose of making App?

- What are the main features of App that will be useful for customers?

- How this App will be useful in solving problems of the customers?

Predefined App features are very useful in assessing the total development budget of the App. However, research indicates that app design should prioritize user involvement over proprietary offerings when it comes to prioritizing features.

15.3.2 Preliminary Design

Deciding about preliminary design is the first step of an app development, it is important to take time to design an app's fundamental structure. Before the next step, it is always advisable to spend enough time to design the App preliminary. The concept building for production of clear understanding of each and every small element of the app is important. This phase does not take much time for simple app design, but will take time in case of complex applications design.

15.3.3 Market Research

There might be several innovative apps to start various business projects, but before you move into design and development, it is always better to do research work in terms of market requirement. A small research project with the following questions can support the project much before planning and development work begins -

- What are marketing plans for this App?

- Who are target audience for this App?

- How do you want your customers to use your app?

- Which software platform and framework will be used to make it?

- Which mobile app development language will be used?

- Who are your competitors and what is their strategy? Do they have apps? If so, what features do they offer?

- What is overall app development budget?

- What is timeline for development? When will App be launched?

Details on research should also be shared with distribution, product creation and IT managers including the Software development team. Feedback from all departments concerned is necessary before the App development work begins. But the key issue behind evaluating the marketplace is to obtain a detailed understanding of why and how. How did you say that you would sell one million apps? You can answer the question quite clearly if you have done your market research. Wild assumptions find no place.

15.3.4   Market Analysis

A market analysis is a quantitative and qualitative assessment of a market. It looks into the size of the market both in volume and in value, the various customer segments and buying patterns, the competition, and the economic environment in terms of barriers to entry and regulation. The market for mobile apps is growing rapidly like never before. Due to the pandemic, the number of apps downloaded has increased a lot.

15.3.5   Collection of Users Feedback

After the App is ready, share it with friends and relatives and co-workers to get their feedback and modify the App accordingly. Following questions may be asked during this feedback -

- Is this app useful?

- Will this app be used?

- What is the tentative cost of this App?

- Is there anything which can be added to it to make it more useful?

Another essential aspect of market research is the discovery of existing applications in the same category to improve the novelty of the product and to make the new app better appreciated by the consumer. Apps performing any related role must be studied and evaluated to understand where the behaviours are wrong and what others are doing right.

15.3.6   Financial and Technical Feasibility

It is always necessary to check the financial and technical viability of the entire plan before developing app. It is required to verify whether this software can be developed and whether existing technology funding is available to develop this application.

Financial Feasibility: Financial analysis is an essential activity in order to achieve financial viability. It is important to understand App's fixed cost, to estimate profit from consumers. The financial plan should also cover publicity, advertisement and web hosting expenses. Rental fee for App Store should be included as well. A balanced financial plan must be established in advance

Technical Feasibility: Technical feasibility means checking the possibility if App can be developed by using the latest technology or not. It is important to check if organization is capable enough to use the latest technology or not. After the financial evaluations, there may be some technical questions to

answer as well. It is better to discover these aspects before investing significant time and money into a project. You might not be able to find definitive answers to every technical question, but if you do your homework you will at least be able to intelligently discuss technical concerns with the programmer/ expert selected/hired to ensure expected outcomes.

15.3.7 Testing of App Prototype

This is an important stage in the lifecycle of app development. After completing the App with exciting graphics and text, it is important for the app to be thoroughly tested and corrected under a range of real-world scenarios. Link to your original records of design and planning and check all functions.

When checking the Software, take feedback from other users. Mobile online research tools can also be used to collect feedback and analysis in real time. Tests for image, graphics and user interface compatibility across the platform are also needed. When app provides the desired output in all scenarios including appearance and usability of the interface, it is time to make the final preparations to launch this mobile app.

15.3.8   Launchingt he App

The process of releasing an app in the market is extremely critical, as it is largely dependent on the success of this application. For branding and marketing the App, it is always advisable to hire a good marketing agency who will make efforts to launch the App in a very professional manner. Marketing is also one of the most critical activities to get involved at an early stage in the process. The Digital Marketing Team supports keyword analysis, important for SEO and App Store Optimism (ASO), both crucial to discovery. The next step is the submission of the mobile app for sale in different markets. Before starting this phase, high-quality screenshots of the application and promotional video and/or demo must be ready for better results.

In order to promote the app, a website would also be important. This is important for branding and recognition, as well as for searching and finding. Promotion of App should be done through organization's website and social media accounts, blogs etc. to target niche market, e mail campaigning can also be done. To increase awareness of the App to target audience, App Analytics of Google Analytics can also be used in the beginning.

15.3.9   Official Release

Up until this point, App's official release date should be the climax of app marketing efforts. Influential bloggers and journalists could write some papers and articles to apprise the people who showed interest in the App before the launch. There could also be a promotional e-mail drive to attract downloads and raise momentum. If the app is published, try keeping user of the app committed by announcing a special deal or promotion using push notifications so that users open the app. Consider having rewards for consumers to download App, such as a single discount, or free product or

service. App marketing has never been stopped and needs new technologies every day.

Build a simple collaborative feedback channel and respond to users' comments and concerns. Updating your customers quickly will work wonderful. Make sure you evaluate and track those KPIs that identify your marketing goals effectively.

15.4 MOBILE DEVELOPMENT FRAMEWORKS

Over the last few years, the number of smart phone users around the world has grown enormously. There are various types of Mobile Development Frameworks as discussed below:

15.4.1 Native mobile app development

The majority of mobile frames are for cross-platform construction. Generally, the development of a mobile app utilizes frameworks developed by the mobile platform company. We generally use the iOS SDK for iOS—the IDE, i.e., the development software pack. For the development of an Android app, Android SDK is the choice. The frameworks are in the SDKs, each of which has the programming languages. SWIFT or Goal-C are used for iOS and Kotlin or Java for Android.

Typically, native apps are fast. They are fully compliant with the hardware and native functions of the computer, such as camera, accelerometer, etc. They may be very costly, on the other hand. A business or company must concentrate on all major mobile platforms, especially Android and iOS. This means that a separate development team is required to develop an app for their business. It is necessary to maintain the app after deployment which makes the process of setup very expensive.

15.4.2 Cross-platform mobile app development

Mobile cross-platform frames are designed to build mobile applications on more than one platform. Most, if not all of the common cross-platform frames have support Android and iOS development. There are following frameworks as discussed in detail below with their respective advantages and disadvantages:

1. **Ionic:** Ionic is an Angular and Apache-Cordova cross-platform system. It helps you to build applications for more than one mobile platform. An application will work for both iOS and Android on the Ionic cross-platform system. Ionic apps have been created and are built like web apps using standard web technologies such as HTML, CSS and Angular. But Cordova, depending on it, makes it possible to use the native features of the unit. Various advantages and disadvantages of Ionic are discussed below:

Advantages

- As a company owner, you not only need to employ two sets of software developers, but you can use your current web development team to create a mobile app for your audience.

- It saves time and expense by using the Ionic production system.

- Ionic uses web technology, so working with them is easy.

Disadvantages

- In comparison to native apps, ionic apps are less effective.

- Ionic is not the best choice to create apps with high requirements for graphics processing.

2. **Xamarin:** In 2016, Microsoft purchased and opened Xamarin from its owners. Xamarin is a C#-based cross-platform architecture that takes a particular approach for designing cross-platform applications. Unlike hybrid frameworks, which use web technologies, it compiles the individual platforms into native code. Various advantages and disadvantages of Xamarin are discussed below:

Advantages

- Apps that are built using Xamarin have little or no difference as compared to native app output.
- Xamarin helps to create rich UI experiences.
- Xamarin will only share about 90 percent of the codebase for all platforms for you to build the user interface separately for each platform.
- A standard UI can be built across all Xamarin Forms platforms.

Disadvantages

- Xamarin implementations are typically very wide. A simple Android app "Hello World" could take around 16mb.
- Xamarin developers do need some knowledge of their mother tongues. For iOS and Kotlin/Java for Android, Swift/Objective-C.
- While Xamarin itself is free, IDE used for production can be very costly for businesses.
- The incorporation of third-party libraries into Xamarin is often a concern. Although Xamarin tools and libraries provide complete support for native technologies, Xamarin may not be provided by a vendor.

3. **React Native:** React Native is a Facebook mobile platform for the development of mobile applications. It is developed on JavaScript and ReactJS. Contrary to hybrid applications, React Native also uses online technology internally. The web views are not included. It uses actual components of Android or iOS to create user interfaces. It has XML like JSX (Javascript-XML) for the creation of the user interface. React Native then calls for the platform-specific native rendering APIs, i.e. Rendering the programme on the screen with Swift and Java. Various advantages and disadvantages of React native are discussed below:

Advantages

- Respond Native's creation of software saves time. It has a "Hot Reload" feature which lets you view code changes on the phone right away.

- Like Ionic, a new group of developers is not needed to be employed. With React Native, web developers can easily migrate to mobile applications.

- Several ready-made components can be used for production.

- React native-built applications are fast and comparable in compiling them to native code, with native app results.

Disadvantages

- The output is not like that of native apps, as with other cross platform apps. No issue with easy applications. However, applications that require advanced features would develop problems.

- Apps developed with React Native may have memory management problems due to their Javascript history.

- Apart from the React Native team ready-made parts, third-party vendors exist. But the components that they create most frequently appear to be inferior. There are a lot of bugs and malfunctions sometimes.

4. **Flutter:** Flutter is a Google-developed mobile user interface to create a beautiful and interactive interface that takes another approach to cross-platform creation. Unlike hybrid apps that make use of web views, or React Native apps that use native components, Flutter apps fully compile to native code. This native ARM-code compilation means that there is no layer between the system and the CPU that makes apps that are entirely native to Flutter. Flutter can do this by using its own graphics engine called Skia, a popular Google-owned 2D graphics engine. Flutter is developed with a Dart programming language that is object oriented. Various advantages and disadvantages of flutter are discussed below:

Advantages

- Flutter apps are very fast at about 60 fps (frames per second). There are even measurements by some developers in Germany of 120 fps.

- As usual, a single codebase means time and money is saved.

- As with React Native above, Flutter also gives ability to see changes made in code, the instance which is made on mobile hardware, emulator or simulator. This also makes debugging the app much easier.

- Flutter is open source. So is Dart and its graphics engine- Skia.

Disadvantage

- Developers have to learn a new language as Flutter doesn't make use of any previously known language. Although Dart is fairly easy to pick up and this isn't really an issue.

- Games and apps that require a lot of device-specific functions are better off not developed with flutter.

There are many items that rely on knowing the right structure to use. The best choice is to create a game or app that needs a significant number of device-specific functions. However, if your mobile app is reasonably simple, cross-platforming is the best choice because it saves time and money.

Comparison among all these four is given below:

Table 15.1: Comparative Analysis of Mobile Development Frameworks

Basis	React Native	Ionic	Xamarin	Flutter
Developers	Facebook	Drifty	Microsoft	Google
Language	JavaScript	TypeScript	C#	Dart
Performance	Close to native	Moderate	Moderate	Amazing controller
Code resusability	90%	98%	98%	50-90%
Testing	Mobile device or emulator	Any browser	Mobile device or emulator, test cloud	Mobile device or emulator
GUI	Uses native UI controller	HTML, CSS	Uses native UI controllers	Use Proprietary widgets and deliver UI
Apps	Airbnb, Discord, Instagram	MarketWatch, Pacifica, JustWatch	Olo, Stroyo, Apx	KlasterMe, PostMuse Reflectly

Check Your Progress A

1. **Fill in the blanks with appropriate words:**

   i) ………………. is an essential activity in order to achieve financial viability.

   ii) ………………. means to check if App can be developed by using the latest technology or not.

   iii) For the development of an ………………. app, Android SDK is the IDE of choice.

   iv) ………………. frames are designed to build mobile applications on more than one platform.

   v) ………………. is an Angular and Apache-Cordova cross-platform system.

2. **State whether the following are true or false.**

   i) Feasibility problem relates to whether a mobile device app is more suitable than a web application.

   ii) Native apps are fast.

   iii) In comparison with native apps, ionic apps are more effective.

   iv) While Xamarin itself is free, IDE used for production can be very costly for businesses.

   v) React native-built applications are fast and comparable in compiling them to native code, with native app results.

3. What are the advantages of Flutter Apps?

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4. What do you mean by React Native?

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15.5   App Store

Apps were in the beginning planned for efficiency assistance such as email, calendar, and contact databases, but the public demand for apps caused rapid expansion into other areas such as mobile games, factory automation, GPS and location-based services, order-tracking, and ticket purchases, so that there are currently millions of apps accessible. Apps are in general downloaded from application distribution platforms which are operated by the owner of the mobile operating system, known as App stores. Most popular types of APP stores are such as Google Play Store and IOS App Store (iOS), explained in detail below:

Types of APP Store

1.Google Play Store: Google Play Store, in the past known as Android Market, is a digital distribution service operated and developed by Google. It provides as the official app store for certified devices running on the Android operating system, allowing users to browse and download applications developed with the Android software development kit (SDK) and published through Google. Google Play also serves as a digital media store, offering music, books, movies, and television programs.

Fig 15.3: Google Play Store

The services integrated in Google Play are Google Play Books, Google Play Games, and in earlier times included Google Play Music before being discontinued in favor of YouTube Music and Google Podcasts in December

2020, Google Play Newsstand before it was phased out in November 2018, and Google Play Movies & TV before being renamed to Google TV in September 2020.

Google states in its Developer Policy Center that "Google Play supports a diversity of monetization strategies to benefit developers and users, including paid distribution, in-app products, subscriptions, and ad-based models", and requires developers to comply with the policies in order to "ensure the best user experience". It requires that developers charging for apps and downloads through Google Play must exercise Google Play's payment system. In-app purchases unlocking additional app functionality must also use the Google Play payment system, except in cases where the purchase "is exclusively for physical products" or "is for digital content that may be added outside of the app itself (e.g. songs that can be played on other music players)

Find & download apps or digital content

a) On your device, open Google Play Store. or visit the Google Play store on a web browser.
b) Search or browse for content.
c) Select an item.
d) Select Install and pay item's price.
e) Follow the on-screen instructions to complete the transaction and get the content.

2. **iOS App Store (iOS):** The IoS App Store is a digital distribution platform, developed and maintained by Apple Inc., for mobile apps on its iOS & iPadOS operating systems. The store allows users to browse and download apps developed with Apple's iOS Software Development Kit. The Apple Store app provides a more delicate way to shop for the most up-to-date Apple products and accessories.

Fig 15.4: iOS App Store

How to get the App Store on iOS?

1. Launch Settings app on your iOS device.
2. Now, tap on Screen Time.
3. Now Content & Privacy Restriction.
4. Next, you have to enter your Restrictions passcode.
5. Now tap on iTunes & App Store Purchases.
6. Click on Installing Apps.
7. Now, make sure the switch next to Installing Apps is ON. If in case, it is Off turn it On.

15.6 APPS FOR VARIOUS DOMAINS & SEGMENTS

There are various types of Apps developed and confined to various domains, a brief about all that is explained below:

1. **Augmented and Virtual Reality App:** Virtual reality apps are one of the most popular apps developed in the segment. Many of the VR based app are most popular among users few examples of such apps are Pokemon Go, Google Map etc. Pokemon Go with its augmented reality mode broke the app market and became viral. The well-known social application with Google Maps became top app from last many years as the number of users of this application is constantly growing. Another VR app worth mentioning is Just a Line, an experimental app that allows you to make simple drawings using your phone in augmented reality, film a short video, and share it with your friends. Mobile virtual reality or VR has never been that affordable. Anyone who has a smartphone can purchase a cardboard VR headset to get the experience of VR apps available for download in app stores or to watch 360-degree videos on Youtube.

2. **Artificial Intelligence Apps:** Artificial Intelligence is more than just an assistant, it learns from user behaviour, it is integrated into chatbots and thus leverages user experience in-app. AI can not only make your app smarter but also saves money. No doubt everyone who has a smart phone has at least heard of Siri or Google Assistant or similar AI apps that aim to make our life easier by searching for information using voice commands.

Fig 15.5: Artificial Intelligence

3. **Retail Shopping Apps:** These days retail shoppers are not lacking behind in competition. They have also started leveraging benefits of new technology by developing their online apps. Nowadays a shop doesn't have to be big to start taking benefits from creating its mobile app. The advantage of having a mobile application for even a small business is that it increases brand recognition and brings the e-

commerce user experience to a whole new level, it helps to build customer loyalty, to collect feedback as well as simply stand out from the crowd. For example, Max, FBB and Reliance Trends have made their omni channel presence.

4. **Restaurants and Food Delivery Apps:** More and more people prefer to check the place and its menu before actually going there. Restaurant and food apps encourage clients' interaction, develop loyalty, and increase brand recognition.

Fig 15.6: Food Delivery Apps

In 2020, the top food app became Uber Eats with its sales system, built-in navigation, and online payments. Another popular app in the food sector turned out to be Domino's Pizza app that helps you to place your order using AI and track your pizza location on the map and also allows pre orders and thus saves waiting time.

5. **Mobile Wallets, Banking and Finance Apps:** In coming years, the number of financial apps users is going to reach in billions. On average users check their bank account and make some transfers using apps every day. Mobile wallets, and other popular online payment trends in the last years, is a great option for those who do not want to carry the plastic debit and credit cards but rather just take their smart phone whenever they go out. Android users can install Google Pay while people who prefer iOS can use Apple Pay. The online payment apps provide great ease and convenience to the users. Also have some add on benefits such as cash back, discounts etc. which is found to be more lucrative.

6. **Video Streaming Apps**: Video Streaming are one of the most popular apps especially in the adolescent segment. Gone are the days when people used to wait for going to the theatre to watch any movie. A huge upsurge was noticed in the times of COVID especially in the entertainment industry. Most of the movies were launched on these platforms giving viewers a wide access with no extra cost.

Fig 15.7: Netflix

Netflix, the leading TV show broadcasting service, was ahead in annual consumer spending in 2020, while YouTube was number one in time spent. YouTube Kids aimed at children aged 4 and up, meant to protect them from inappropriate content, also remained among leaders in some countries. The video streaming service for gamers Twitch was in the top five apps by time spent in countries such as the US, Canada, Australia, to name a few.

Check Your Progress B

1. What do you understand by Google play store?

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2. How to get the App Store on iOS?

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3. What is augmented reality or virtual reality based apps?

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4. State some of the popular examples of retail shopping apps.

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15.7 LET US SUM UP

An app is short form of a term called "application," it is basically a type of software that can be installed and run on a computer, tablet, Smartphone or other electronic devices. An app is simply a piece of software that you can get access to and use through the internet. Many apps are also available for mobile devices and even some TVs. Mobile applications may be classified by numerous methods. A common scheme is to distinguish native, hybrid, and web-based apps. Native apps are developed for their particular platform, taking full advantage of the software and the operating systems' features. Web-based applications are a particular type of software that allows users to

interact with a remote server through a web browser interface. The concept of the hybrid app is a mix of native and web-based apps. Then there are few popular desktop applications such as word processor and media players and mobile apps such as Gmail, Instagram, duolingo etc.

Development of an app is a comprehensive task involving various steps, which needs to be followed while developing any app such as, defining mobile app objectives, preliminary design, market research, market analysis, collection of users feedback and information about competitors, financial and technical feasibility, testing of app prototype, launching the app, official release.

Over the last few years, the number of smart phone users around the world has grown to the trillions. Many companies are now focused on developing mobile apps for their consumers with a website. There are various types of Mobile Development Frameworks such as, Native mobile app development-typically, native apps are fast. They are fully compliant with the hardware and native functions of the computer, such as camera, accelerometer, etc. Cross-platform mobile app development: these are designed to build mobile applications on more than one platform. The most popular cross platform development frameworks are Ionic, Xamarin, React Native, Flutter.

Apps were in the beginning planned for efficiency assistance but the public demand for apps caused rapid expansion into other areas. Apps in general are downloaded from application distribution platforms which are operated by the owner of the mobile operating system, known as App stores. Most popular types of APP stores are such as Google Play Store, which is a digital distribution service operated and developed by Google and IOS App Store (iOS), which is a digital distribution platform, developed and maintained by Apple Inc., for mobile apps on its iOS & iPadOS operating systems.

There are various types of Apps developed and confined to various domains such as Augmented and Virtual Reality Apps, Artificial Intelligence Apps, Retail Shopping Apps, Restaurants and Food Delivery Apps, Mobile Wallets, Banking and Finance Apps, Video Streaming Apps.

15.8   KEYWORDS

App: An app is short form of a term called "application," it is basically a type of software that can be installed and run on a computer, tablet, Smartphone or other electronic devices.

Flutter: Flutter is a Google-developed mobile user interface to create a beautiful and interactive interface that takes another approach to cross-platform creation. Unlike hybrid apps that make use of web views, or React Native apps that use native components, Flutter apps fully compile to native code.

Google Play Store: Google Play Store, in the past known as Android Market, is a digital distribution service operated and developed by Google. It provides as the official app store for certified devices running on the Android operating system.

Hybrid Apps: The concept of the hybrid app is a mix of native and web-based apps. Apps developed using Apache Cordova, Xamarin, React Native, Sencha Touch and other similar technology fall into this category.

Ionic cross-platform system: Ionic is an Angular and Apache-Cordova cross-platform system. It helps you to build applications for more than one mobile platform. An application will work for both iOS and Android on the Ionic cross-platform system.

iOS App Store: The iOS App Store is a digital distribution platform, developed and maintained by Apple Inc., for mobile apps on its iOS & iPadOS operating systems. The store allows users to browse and download apps developed with Apple's iOS Software Development Kit.

Native Apps: Native apps are developed for their particular platform, taking full advantage of the software and the operating systems' features. These apps can directly access the hardware of the device such as the GPS, camera, microphone, etc.

React Native: React Native is a Facebook mobile platform for the development of mobile applications. It is developed on JavaScript and ReactJS. Contrary to hybrid applications, React Native also uses online technology internally. The web views are not included.

Technical Feasibility: Technical feasibility means to check if App can be developed by using the latest technology or not. It's important to check if organization is capable enough to use the latest technology or not.

Web-based Apps: Web-based applications are a particular type of software that allows users to interact with a remote server through a web browser interface.

15.9   ANSWERS TO CHECK YOUR PROGRESS

Check Your Progress A

1. (i) Financial analysis   (ii) Technical feasibility   (iii) Android   (iv) Mobile cross-platform   (v) Ionic

2. (i) True   (ii) False   (iii) False   (iv) True   (v) True

15.10   TERMINAL QUESTIONS

1.   What are the three broad classifications of an app?

2.   What are the various types of desktop and mobile apps?

3.   What are the activities required for concept building?

4.   Describe the various steps of an App development process.

5.   What do you mean by financial and technical feasibility of the plan?

6.   What are the two types of mobile development frameworks?

7.   What is an app store? What are its various types?

8. What is an ionic cross-platform system? State its advantages and disadvantages.

9. What is Flutter? State its advantages and disadvantages.

10. State the differences among React native, Ionic, Xamarin and Flutter.

11. What are different types of apps in various domains and segments?

Note	These questions are helpful to understand this unit. Do efforts for writing the answer of these questions but do not send your answer to university. It is only for your practice.

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