WELCOME
Mobile Applications Testing

Mobile Ecosystem

Mobile World Statistics

Carriers/Service Providers

Network

Manufactures

Devices

Platforms/OS

Frameworks

API-Apps

Services

FRAMEWORKS : distinguishing features

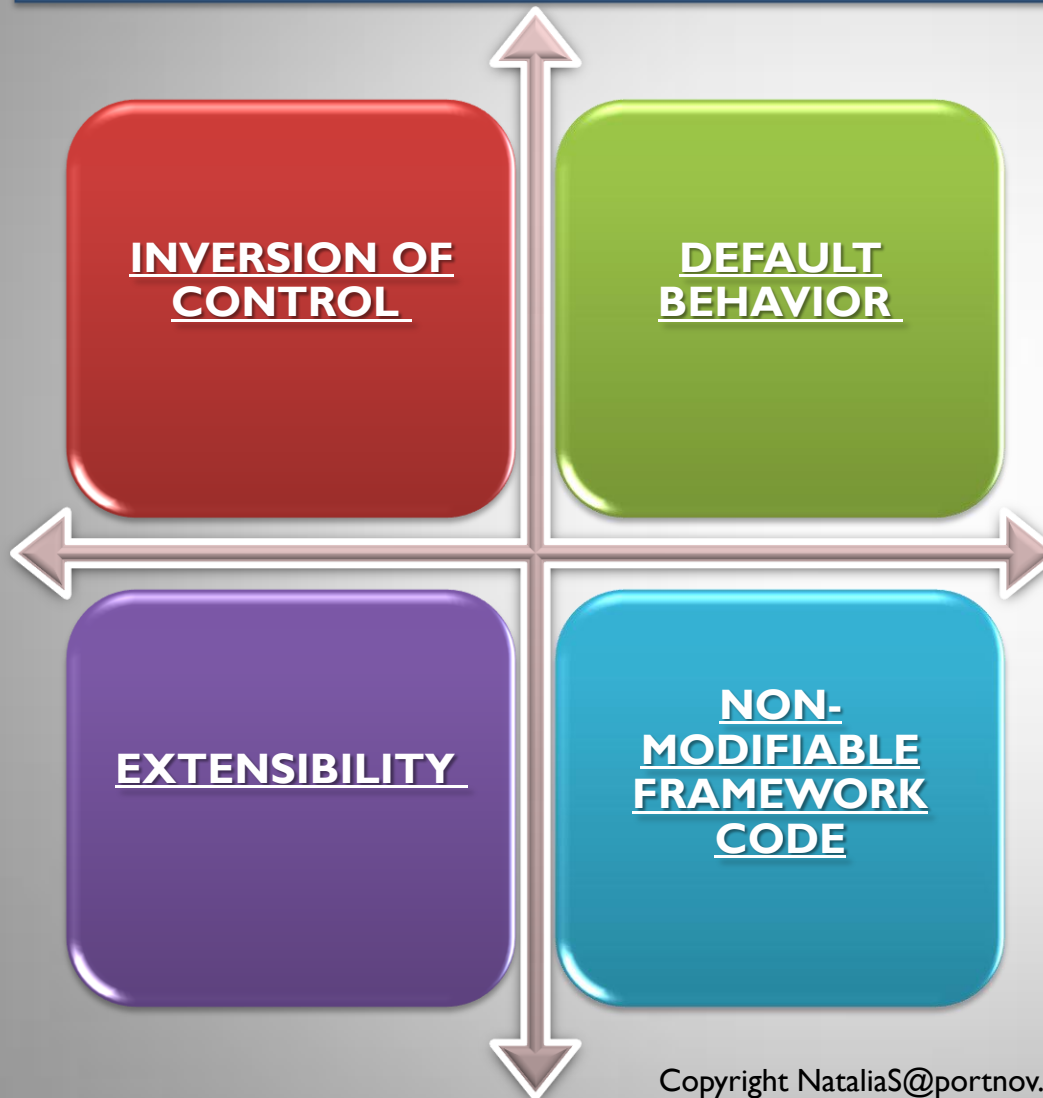## SOFTWARE FRAMEWORK

Sets of libraries or classes

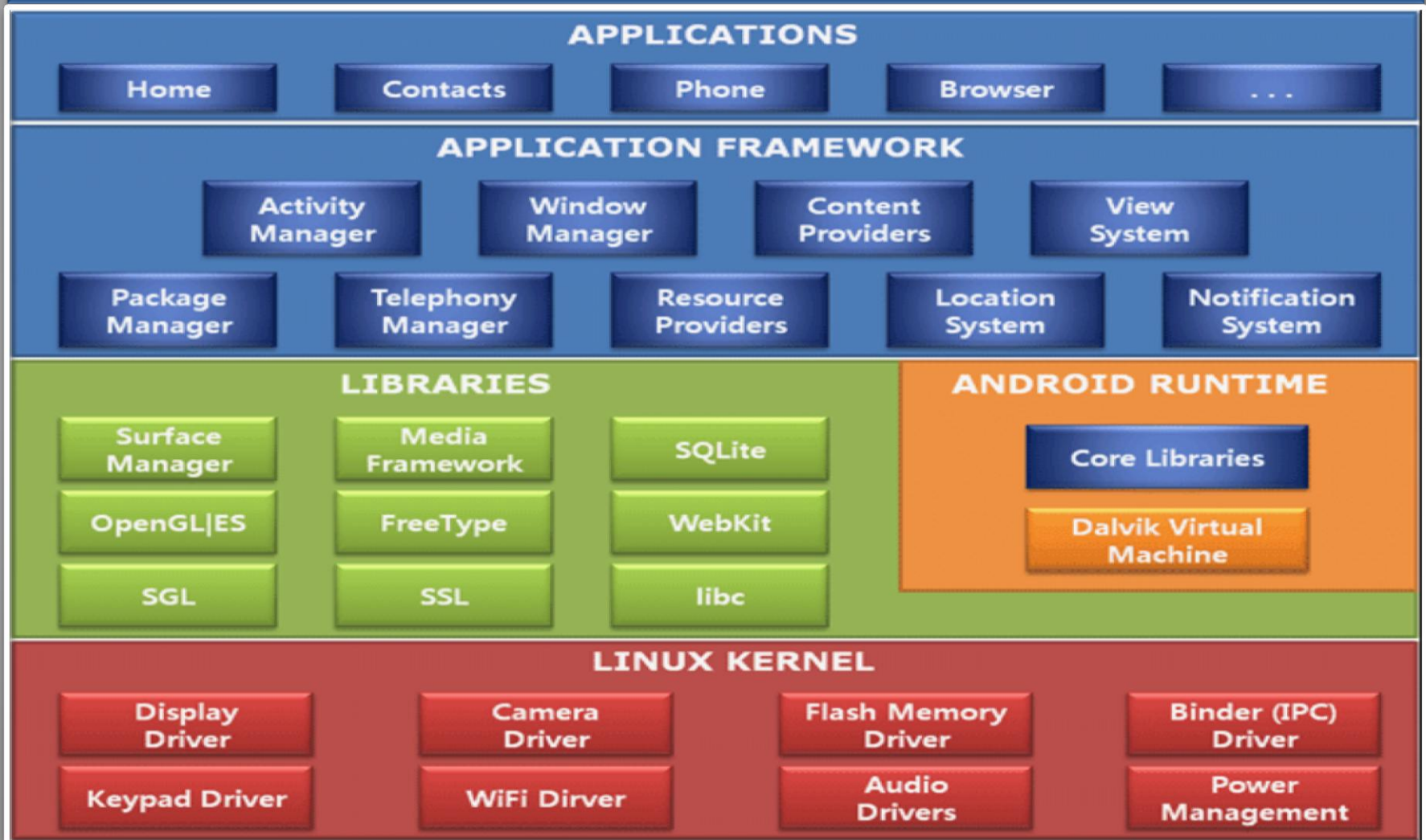| Built-in generic functionalities, Deals with standard low-level details	Reusable software environment	Working template application	Can be modified by writing additional code

FRAMEWORKS : distinguishing features

INVERSION OF CONTROL

DEFAULT BEHAVIOR

EXTENSIBILITY

NON-MODIFIABLE FRAMEWORK CODE

Platforms / OS :
ANDROID ARCHITECTURE

APPLICATIONS

| Home | Contacts | Phone | Browser | . . . |

APPLICATION FRAMEWORK

| Activity Manager | Window Manager | Content Providers | View System |

| Package Manager | Telephony Manager | Resource Providers | Location System | Notification System |

LIBRARIES

Surface Manager	Media Framework	SQLite
OpenGL|ES	FreeType	WebKit
SGL	SSL	libc

ANDROID RUNTIME

Core Libraries

Dalvik Virtual Machine

LINUX KERNEL

| Display Driver | Camera Driver | Flash Memory Driver | Binder (IPC) Driver |
| Keypad Driver | WiFi Dirver | Audio Drivers | Power Management |

Platforms / OS :
ANDROID ARCHITECTURE

Linux kernel
➢ This provides basic system functionality like process management, memory management, device management like camera, keypad, display etc.

Libraries
➢ It is this layer that enables the device to handle different types of data

Android Runtime
➢ The Android runtime also provides a set of core libraries which enable Android application developers to write Android applications using standard Java programming language

Application Framework
➢ The Application Framework layer provides many higher-level services to applications in the form of Java classes. Application developers are allowed to make use of these services in their applications.

Applications
➢ You will find all the Android application at the top layer. You will write your application to be installed on this layer only. Examples of such applications are Contacts Books, Browser, Games etc.

FRAMEWORKS
Example → ANDROID APP

Application Framework sits on top of native libraries, android runtime and Linux kernel.

This framework come pre-installed with high-level building blocks that developers can use to program applications.

RIGHT SIDE → the most important application framework components for our application and Android development in general.

Activity Manager	• **Manages the lifecycle of application**
Content Provider	• **Stores and retrieves data and makes it accessible to all applications**
View system	• **Handles GUI related Tasks**
Package Manager	• **Retrieves various info related to the currently installed app on a device**
Resource Manager	• **Provides access to non-code resources such as icons, etc**
Location Manager	• **Location-based and related services**
Notification Manager	• **Executes and Manages all Notifications, alerts, etc**

FRAMEWORKS
Example → Win CE and OS X

SF is a universal, reusable software platform used to develop applications, products and solutions.

SF include support programs, compilers, code libraries ,APIs and tool sets that bring together all the different components to enable development of a project or solution.

- Platform: Windows CEŽ
- OS: Windows Phone
- Framework: .NET

- Platform: OS Xž
- OS: iOS
- Framework: Cocoa Touch

FRAMEWORKS : CONCLUSION

SUMMARY

Soft development is about getting stuff done, not figuring out how to get it done.

Frameworks and libraries help the developers focus on creating rather than figuring stuff out.

Rather than reinventing the wheel, Developers can use a framework or library to delegate brunt, noncreative and repetitive work, freeing up their time and energy to create the actual website or application.

Mobile Ecosystem

Mobile World Statistics

Carriers/Service Providers

Network

Manufactures

Devices

Platforms/OS

Frameworks

API-Apps and other

Services

API-APP

Application Programming interface (API) is a set of functions, classes, libraries, or packages (a.k.a. frameworks)

API allowing developers access an application's services by using the programming languagesŽ

An API may include specifications for routines, data structures, object classes, and variables
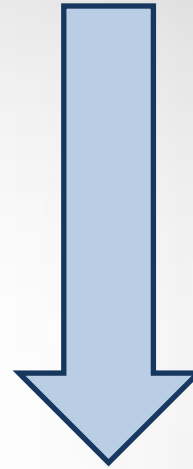
Generally speaking, API →specification of how some SW components should be interacting with one another other Tutorial : Click Here

API-APP

An **Application Program Interface (API)** is code that allows software programs to communicate with each other.

It defines the correct way to write a program that requests services from an operating system or other application.

APIs are implemented by function calls.

The API defines the correct way for a developer to write a program that requests services from an Operating System or other application.

API-APP : How they Work?

APIs are made up of two related elements.

The first is a specification that describes how information is exchanged between programs, done in the form of a request for processing and a return of the necessary data.

The second is a software interface written to that specification and published in some way for use.

The software that wants to access the features and capabilities of the API is said to call it, and the software that creates the API is said to publish it.

The three basic types of APIs

APIs take three basic forms: local, web-like and program-like. Here's a look at each type.

Local APIs

The original API, created to provide operating system or middleware services to application programs.

Web APIs

Designed to represent widely used resources like HTML pages and are accessed using a simple HTTP protocol. Often called REST APIs or RESTful APIs.

Program APIs

Based on RPC technology that makes a remote program component appear to be local to the rest of the software.
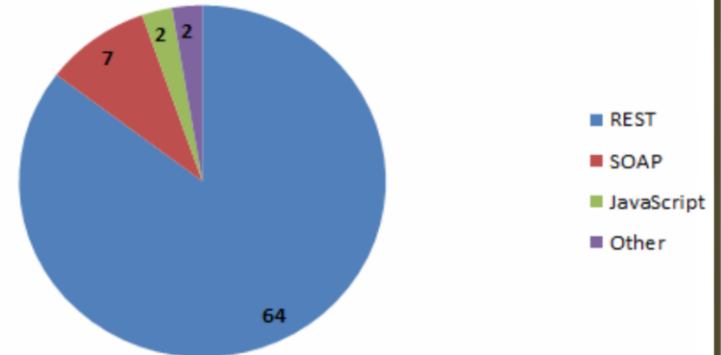
Local APIs are the original form, from which the name came.

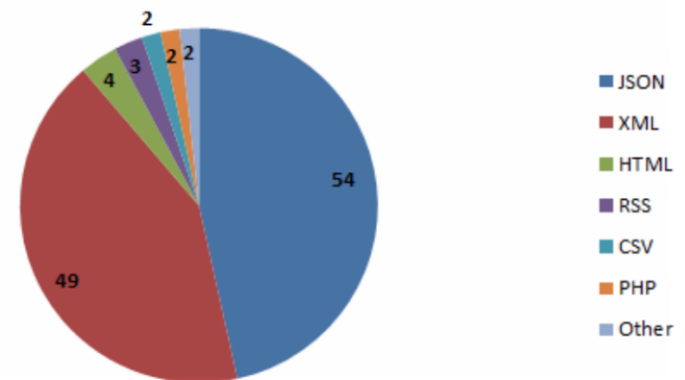*They offer OS or middleware services to application programs.*

Example :

Microsoft's .NET APIs, the TAPI (Telephony API) for voice applications, and database access APIs

Protocols Used in Local APIs

- REST
- SOAP
- JavaScript
- Other

7   2   2   64

Data Formats Used in Local APIs

- JSON
- XML
- HTML
- RSS
- CSV
- PHP
- Other

2   4   3   2   2   54   49

API-APP Basic Types

APIs take three basic forms:

Web APIs are designed to represent widely used resources like HTML pages and are accessed using a simple HTTP protocol.

Any web URL activates a web API.

Web APIs are often called REST (representational state transfer) or RESTful because the publisher of REST interfaces doesn't save any data internally between requests.

As such, requests from many users can be intermingled as they would be on the internet.


Desktop browser

Connected TV app

Smartphone app

Web Pages

Cross-device web site

Partner program

Web APIs

Tablet app

Connected Device program

API-APP Basic Types

APIs take three basic forms:

Program APIs *are based on* **remote procedure call (RPC)** *technology that makes a remote program component appear to be local to the rest of the software.*

Service oriented architecture (SOA) APIs, such as Microsoft's WS-series of APIs, are program APIs.
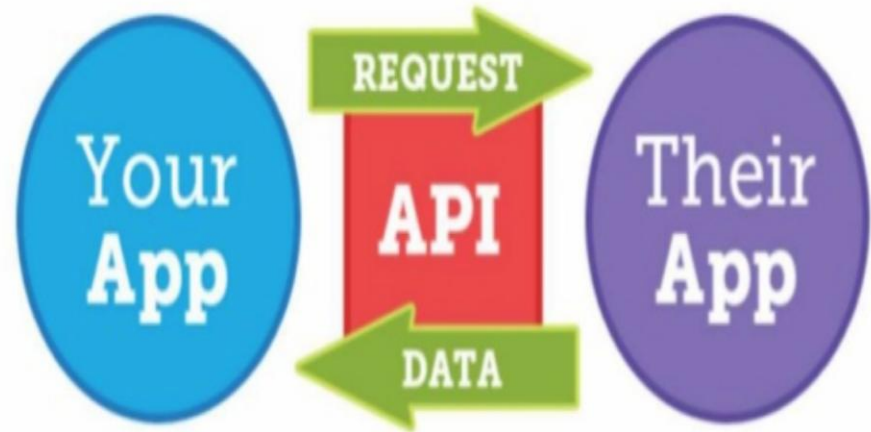
API-APPS : EXAMPLES
The following list contains several examples of popular APIs:

Google Maps API: Google Maps APIs lets developers embed Google Maps on webpages using a JavaScript or FlashInterface

YouTube APIs: YouTube API: Google's APIs lets developers integrate YouTube videos and functionality into websites or applications

Flickr API: The Flickr API is used by developers to access the Flick photo sharing community datThe Flickr API consists of a set of callable methods, and some API endpoints

Twitter APIs: Twitter offers two APIs. The REST API and Search API

Amazon Product Advertising API: Amazon's Product Advertising API gives developers access to product selection and discovery

UserEngage : Engagement tool, marketing automation platform that tracts you visitors

Mobile Ecosystem

Mobile World Statistics

Carriers/Service Providers

Network

Manufactures

Devices

Platforms/OS

Frameworks

API-APP

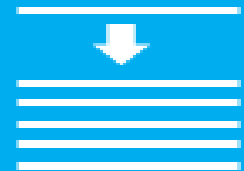**Services**

SERVICES

SERVICES : Mobile Banking, Payments

Mobile banking can be done

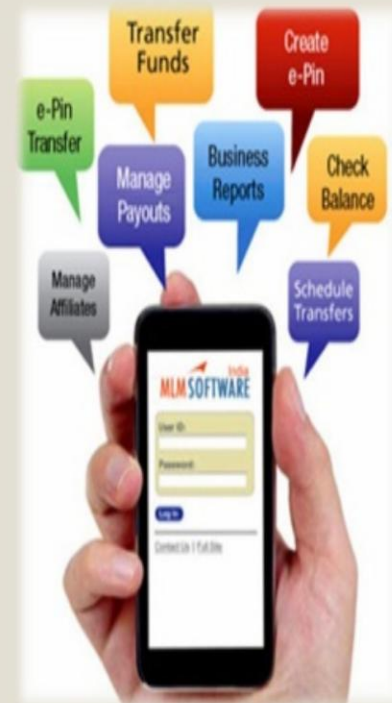| by accessing bank's web page through the web browser on your mobile phone, | via text messaging | by using an application downloaded to your mobile phone |

Mobile Banking Services

○ Account information

○ Transaction

○ Investments

○ Support

○ Content services

SERVICES :
Location Based Services (LBS)

LBS include services are to identify a location of a person or object, such as discovering the nearest banking cash machine or the whereabouts of a friend or employee.

LBS include parcel tracking and vehicle tracking services.

LBS can include mobile commerce when taking the form of coupons or advertising directed at customers based on their current location.

They include personalized weather services and even location-based games.

SERVICES :
Location Based Services (LBS)

Location Based Services

Maps & Navigation	Tracking Services	Information Services	Application
• Maps • Routing • Assisted Navigation	• Friends & Family Finder • Traffic • Vehicle Tracking	• Yellow Pages (Local Search) • City Guides • User Generated Content (UGC)	• Social Networking • Context Advertising

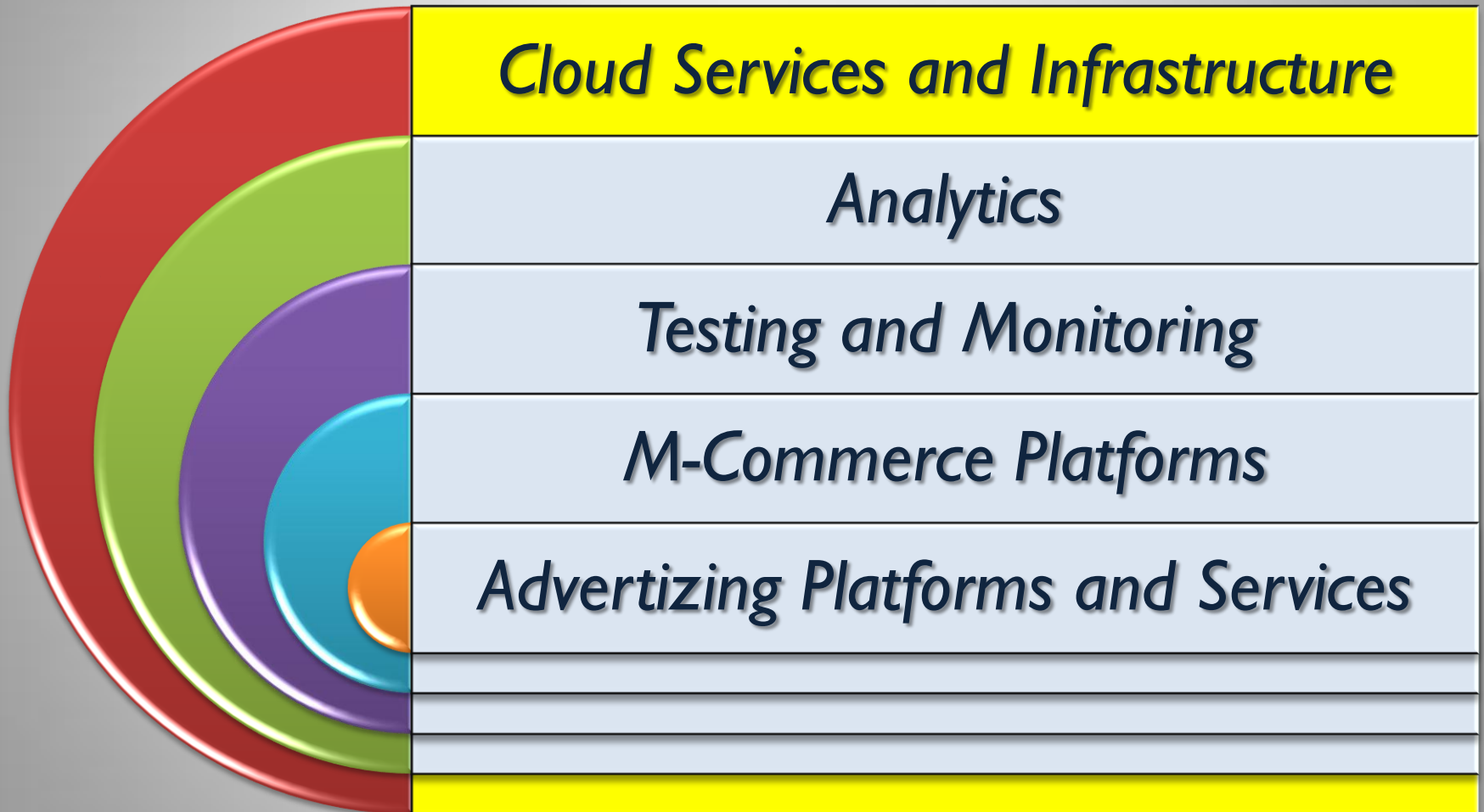Copyright Telecom Circle

SERVICES

Cloud Services and Infrastructure

Analytics

Testing and Monitoring

M-Commerce Platforms

Advertizing Platforms and Services

SERVICES :
Cloud Services and Infrastructure

WHAT IS THAT ?

The **Mobile Cloud** is Internet-based data, applications and related S**ervices** accessed through Smart Phones, Laptop Computers, Tablets and other portable devices.

According to the survey, mobile cloud computing is emerging as one of the most important branches of cloud computing, and is still in its infancy. Therefore it's highly relevant to clarify the confusion that has arisen around mobile cloud computing.

SERVICES :
Cloud Services and Infrastructure

A mobile cloud should be able to sync a wide variety of data and content, between any source and device.

Even with fast 4G networks, there will still be pockets of non-networked areas and times when devices are offline, and people will still want access to their data and content.

Furthermore, for a good user experience, it is necessary for many apps to access local device

Dropbox

icloud

SERVICES :

Cloud Services and Infrastructure : Summary

An important aspect of a mobile cloud platform is the ability to remotely manage devices over the air, in terms of provisioning devices, performing diagnostics, updating software and settings, and remotely locking devices and erasing data for security reasons.

These functions are typically found today with higher end SmartPhones such as BlackBerries and iPhones, but they are increasingly becoming expected with other types of portable devices.

SERVICES

Cloud Services and Infrastructure

Analytics

Testing and Monitoring

M-Commerce Platforms

Advertizing Platforms and Services
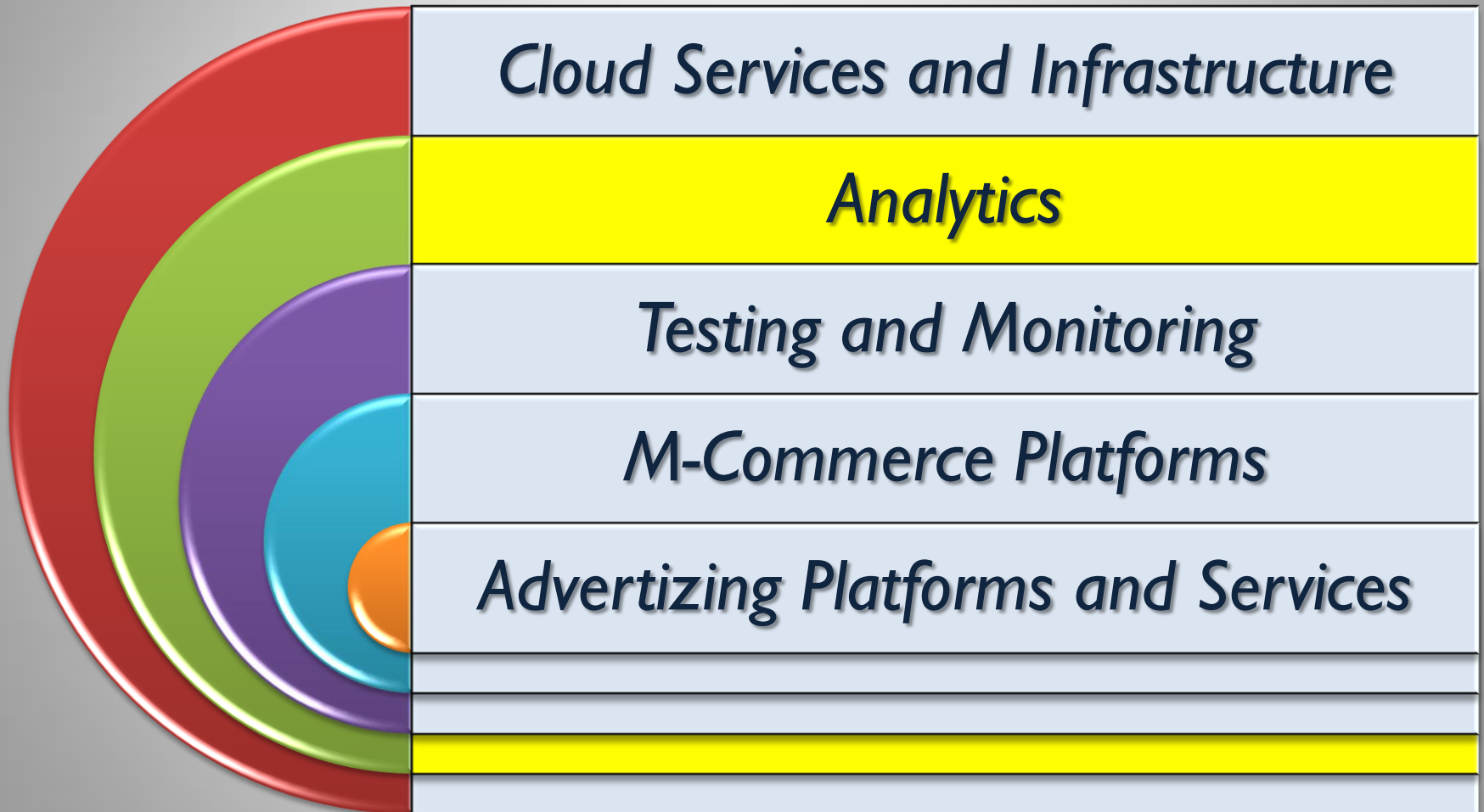
SERVICES :
Analytics

WHAT IS THAT ?

It could be separated in these categories

Mobile **ANALYTICS** involves measuring and analyzing data generated by mobile platforms and properties, such as mobile sites and mobile applications

It tracks, measures and understands how mobile users are interacting with mobile sites and mobile apps.

app analytics

digital analytics

web analytics

SERVICES :
Analytics

app analytics → *App analytics, or mobile app analytics, is the measurement and analysis of data generated when users interact with your mobile applications*

digital analytics → *Digital analytics encompasses the collection, measurement, analysis, visualization and interpretation of digital data illustrating user behavior on websites, mobile sites and mobile applications.*

web analytics → *Web analytics groups together the measurement, collection, analysis and presentation of data from the Internet in order to understand and optimize how websites are used.*

SERVICES :
Analytics TOOLS

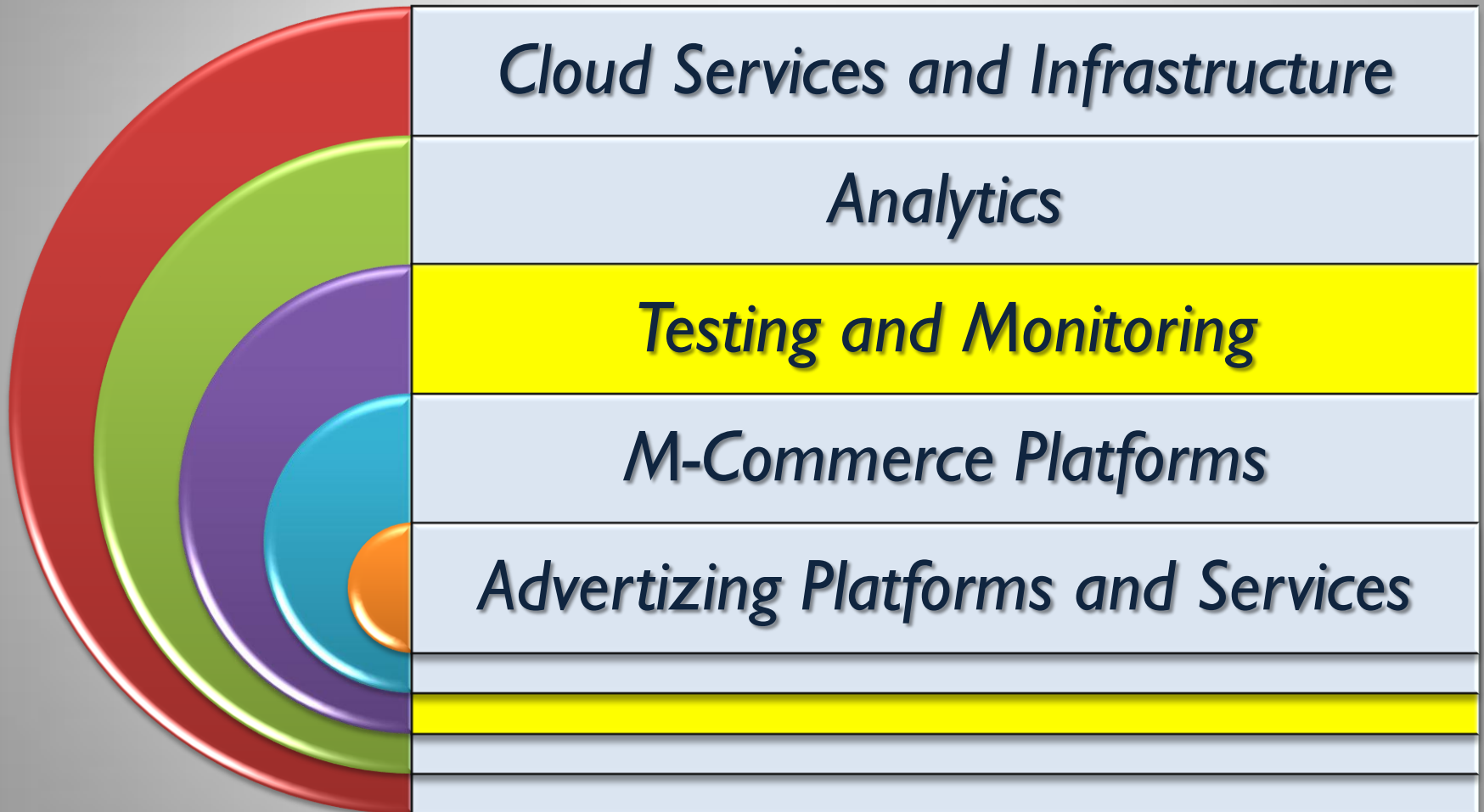- http://www.bluecloudsolutions.com/blog/app-analytics-tools-developers/

Check this link to learn more about TOOLS

"Insights from Google Analytics for Mobile Apps resulted in a 39% increase in store traffic and a more than 5x increase in game tutorial completion."

Mike McCarthy, Senior Brand & Community Manager, Certain Affinity

FLURRY**MEASURES**
INDUSTRY LEADING MOBILE ANALYTICS – FOR FREE

FLURRY FOR ADVERTISERS
FLURRY FOR PUBLISHERS
FLURRY ANALYTICS

Apsalar Attribution
Collect and Measure In-App Customer Actions

Get the mobile app attribution data you need to profile customers and identify sales opportunities. Assess ROI performance for all your marketing partners. Why settle for an partial view of the market that excludes important publishers when Apsalar can provide a 360 view, including comprehensive Facebook attribution. Collect and measure customer acquisition and re-engagement actions. Understand every customer event to bring each person into perfect focus.

SERVICES

Cloud Services and Infrastructure

Analytics

Testing and Monitoring

M-Commerce Platforms

Advertizing Platforms and Services

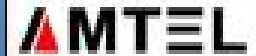# SERVICES :
Testing and Monitoring

With limited resources and a need for quality assurance, mobile application testing can be an intimidating task.

Mobile app testing and monitoring provides companies with a way to discover and address the issues that affect mobile app performance, adoption and user retention.

The ability for customers to seamlessly access web-based services at any time, from any location, and on any mobile device is a key revenue enabler.

Keynote

AMTEL

airwatch
by vmware

ManageEngine
Powering IT ahead

SOTI

SERVICES :
Testing and Monitoring : HOMEWORK

- **Perfecto Mobile** is a global provider of cloud-based testing, automation and monitoring solutions for **mobile** applications and websites utilizing a wide selection of REAL and emulated **mobile** devices.

- Please use this link to get familiar with this tool :

- https://www.youtube.com/user/PerfectoMobile

- **Keynote DeviceAnywhere**, now known as Keynote Mobile Testing, is a solution made by Keynote Systems, Inc. that provides a service for planning, testing and monitoring the functionality, usability, performance and availability of mobile apps and websites

- Please use this link to get familiar with this tool :

- https://www.youtube.com/watch?v=rtvz9yrw95Y