

Mobile Applications Development

Design and security

Course 4



MAD 4th Phase - *What exactly is an app?*

- “App” is the shorthand for “application”.
- In general, the term is now used to refer to software that runs on a mobile device (smartphone, tablet) even if sometimes it’s used in the case of PCs
- An app is a software developed with the purpose of making a task/tasks, easier and more streamlined.

MAD 4th Phase - *How much “general” is an app?*

- **1. Some apps are specific to a particular device**

Due to different programming languages used for different operating systems (iOS, Android, WP...) apps will only run on devices for which it is specifically written.

many devices ⇔ many versions

- **2. Other apps can run on multiple devices**

Web technologies and cross-platform frameworks make it possible to develop apps which can run on multiple and different device types.

So, we have:

1. **Mobile apps**, that can't run on any device, but, have full interactive capabilities and can run without an internet connection.
2. **Mobile websites**, that can run on any device, but, only with a browser and internet connection

1. **A mobile application** is a software application that works on a specific mobile device's operating system and is downloaded to the device to perform a specific task.
2. **A mobile website** is a site that is intended to be viewed using a mobile browser on the various display sizes of smartphones or tablets.

Development tools and languages:

1. Xcode, Android Studio, Xamarin Studio, Corona SDK... -> Java, Objective-C, C#, Lua...
2. HTML, CSS, JavaScript

MAD 4th Phase - *How much “general” is an app?*

Mobile/Native Apps

- Testing begins with app installation and launch
- Testing on some mobile devices requires access to a device ID
- Functionality and Usability need to be tested on multiple devices. Consider:
 - Operating System and version
 - Screen size
 - Custom themes
 - Interruptions
- Many native apps have access to additional APIs. Those connections need to be tested.

Mobile Web

- No installation required
- How does the site render in different browsers
 - iOS runs Safari
 - Android runs a stock browsers, but also supports Chrome, Dolphin, Opera Mini and third party browsers
 - Windows Phone runs IE
 - Blackberry runs a native browser, Opera Mini or Bolt
- Requires an internet connection,
- Connectivity varies by location
- Load time is extremely important to mobile web users (source):
 - 60% of users expect sites to load within **three seconds**
 - 74% of users will only wait **five seconds**

After these, we can conclude that, neither mobile/native apps or mobile web is going to win out any time soon. Even if in present days there is a mobile web invasion. So, it is important to know the features and issues of both.

The Future:

Mobile Web *Plus* Native Apps *Equal* Hybrid Apps

Examples of Hybrid Apps:

- **ESPN ScoreCenter:** The ESPN App gives you up-to-the-minute scores, news, and video highlights for the NFL, MLB, NBA, College Football, and more.
 - A native app with updated scores within the app
 - Directs users to a mobile website for further articles
- **Lotte Card:** an app for one of South Korea’s biggest credit card companies
 - 100 pages written in HTML and used across platforms
 - A smaller number of custom developed native pages
- **Bank of America**
 - A native app icon pushes users directly to the bank’s mobile site

Native Apps vs. Mobile Web vs. Hybrid Apps

	Device Access	Speed	Development Cost	App Store	Approval Process
Native	Full	Very Fast	Expensive	Available	Mandatory
Hybrid	Full	Native Speed as Necessary	Reasonable	Available	Low Overhead
Web	Partial	Fast	Reasonable	Not Available	None

Source: <http://www.scribd.com/doc/50805466/Native-Web-or-Hybrid-Mobile-App-Development>

MAD 4th Phase - *Does the app I am thinking about already exist?*

Before to think about an app, first, you must do some research about what has already been created.

- these places could be: iPhone Apps, Mac Apps, iPad, Apps for Android, Kindle Fire™ Apps, etc ...
or
- you can use a Search Engines (Google search): searches for the type of app you are looking for or problem you are trying to solve can be very valuable in finding already existing options.

Note: If a similar app already exists on market, you must consider whether your app distinguishes itself in a way which makes it a viable new entry in the market.

App design is a very important process, so important so that Apple has released ***The Human Interface Guidelines*** which describe the rules and principles to design user's interface.

(<https://developer.apple.com/library/ios/documentation/UserExperience/Conceptual/MobileHIG/>)

1. Name.

The app's name should:

- summarize its function.
- be easy to pronounce and spell;
- be memorable.
- stands apart from the names of competitors.
- be short enough to fit under the app's icon (about 11 characters for iOS).

2. Logo

Logos can be simple or complex, and include a logotype (text only), a logo mark (icon), or both.

Must be clear and high quality at a small size.

3. Icons

ICON \neq LOGO.

- The icon is the graphic that will identify an app on market and on user's devices.
- More, the icon is that the user tap every time they want to start an app. So, it is the first thing that user will see in an app and thus will work as a reminder of an application's functionalities.
- ! It is proven that users tend to click and download the most creative, unique and attractive icons. It is clear that the app icon is crucial and must be able to get attention.



3. Icons (continued)

-apps' icons must have specific sizes in order to be displayed correctly on all devices (Table 1).

App Type	Size for iPhone5/ iPod touch (5th generation)	Size for high-resolution iPhone/iPod touch	Size for iPhone/iPod touch	Size for iPad	Size for high-resolution iPad	Size for Android tablet	Size for Android smartphone	Size for Windows 7	Size for Windows 8	Size for BlackBerry 10
App icon (required for all apps)	114 x 114	114 x 114	57 x 57	72 x 72	144 x 144	96 x 96	48 x 48	62 x 62	99 x 99	86 x 86
App icon for the store	1024 x 1024	1024 x 1024	512 x 512	512 x 512	1024 x 1024	512 x 512	512 x 512	300 x 300	300 x 300	480 x 480

Table 1. Icons size criteria

(<https://developer.apple.com/library/ios/documentation/UserExperience/Conceptual/MobileHIG/IconMatrix.html>)

Gold rule: Less is more.

Avoid cramming several images into a single icon.

Ideal: one thing to represent whole app

3. Icons *(continued)*

- Must avoid using style, images and colours that may create confusion with other apps on the stores.
- A satisfying user experience depends on the consistency existing between app's icon and app's internal design.
- Focus on contrast rather than colours.
- Avoid using coloured fonts if you have a lot of content.
- An icon is a graphical representation of a word **SO** avoid to use text. If however must be, avoid using greek text, wavy lines and many letters.
- Avoid using photos/pictures.
- Avoid transparency, because only clearly visible icons encourage tapping (it is also a recommendation of apps' stores).
- *Attention!* When iOS displays an icon, automatically adds: Rounded corners and Drop shadow.

4. Splash Screen

- The *splash screen* also known as *splash image* or *launch image* is the full-screen image that appears while an app is loading after being opened.
- Even if, it is visible for a short time, it helps users to get a first impression of the app.
- The splash screen should be mostly visual and display minimal text.
- It is an opportunity to incorporate branding. The splash image can be used as an opportunity to provide:
 - a design introduction of your app
 - an about window
 - a space to showcase branding elements
- The splash image must be consistent with what users are expected to find inside the app. More, store guidelines often recommend using a splash image very similar to the app's home page.

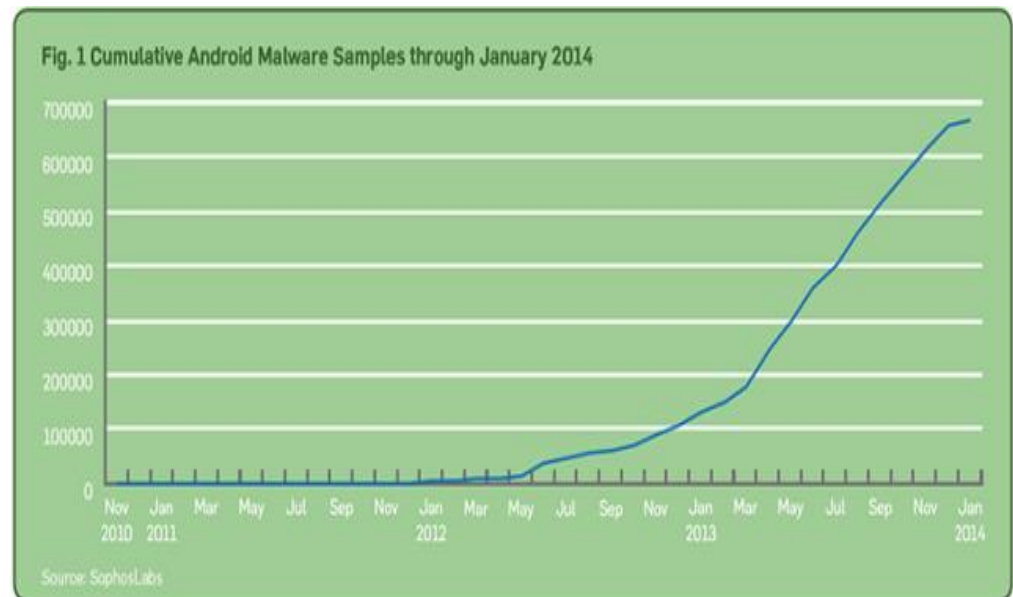
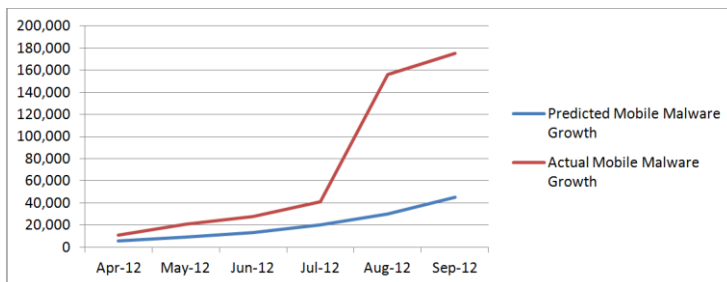
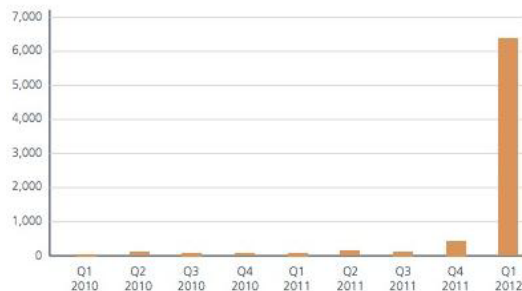
5. User Interface (UI) and Content Design

- Details of the UI will depend on the target device and its operating system.
- Also, keep in mind who target audience is: different generations have different preconceptions of what makes a technology cool and easy to use are radically different. More, another mistake is not knowing what content is useful to each generation in part.
- Forcing registration is another frequent mistake.
- A common and big mistake consist in too many features into only one app. Often, many of these features are unused. The main is to simplify the users' life ie focusing their attention on those few things that really matter.
- Good layout and design allow a user to easily complete tasks. If a button is placed in the perceived 'wrong' place, users will get frustrated and might look for an alternative product/app.

MAD 4th Phase – Mobile Security Issues

No application can ever be 100% secure from threats, but as developers, these are questions that you should always be asking yourself when it comes to security testing for mobile apps:

- **Confidentiality:** Does your app keep your private data private?
- **Integrity:** Can the data from your app be trusted and verified?
- **Authentication:** Does your app verify you are who you say you are?
- **Authorization:** Does your application properly limit user privileges?
- **Availability:** Can an attacker take the app offline?
- **Non-Repudiation:** Does your app keep records of events?



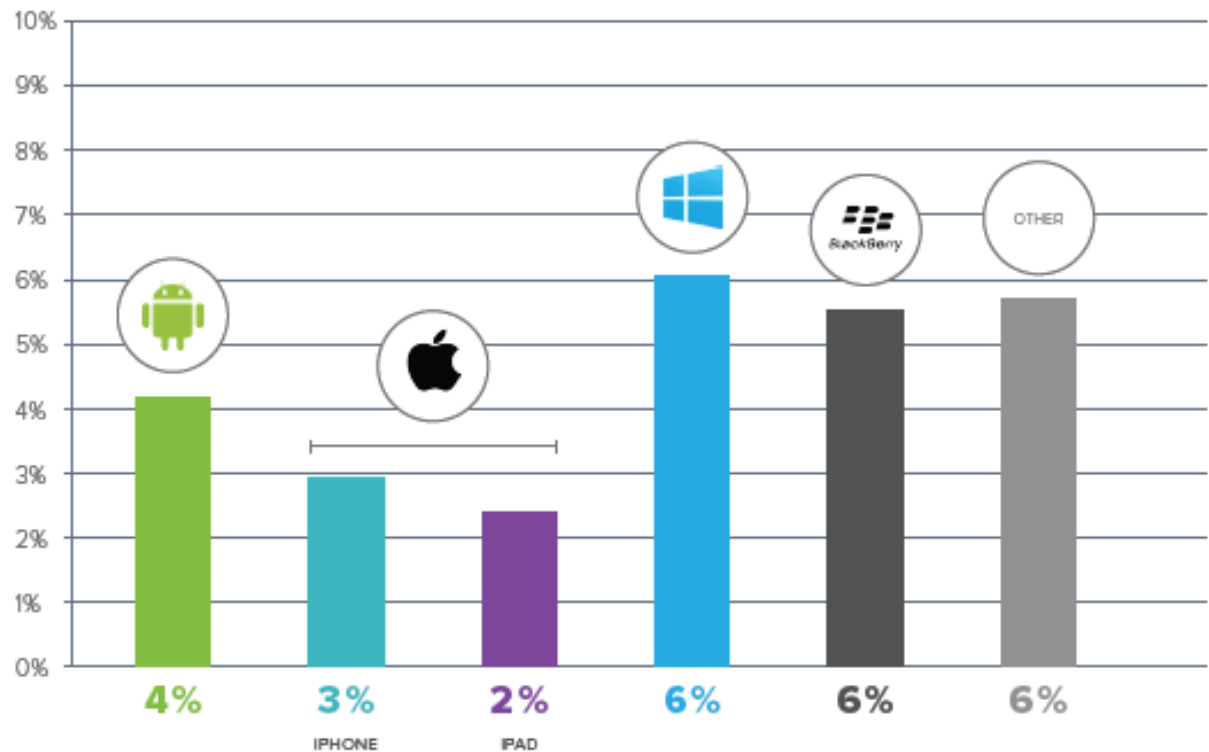
THE FRAUD RISK OF MOBILE

IOVATION 2014

Percentage of High-Risk Mobile Transactions by Operating system

Identity theft, account takeover and stolen credit cards are all serious threats when you do business online. Any Internet-enabled device can be an instrument of fraud in the wrong hands. That's why real-time insight, into the history and current connections of a customer through all of their devices, is critical to assessing risk with a high degree of certainty. Device Identification and reputation provide actionable, relevant data to protect your business whether a device is mobile or not.

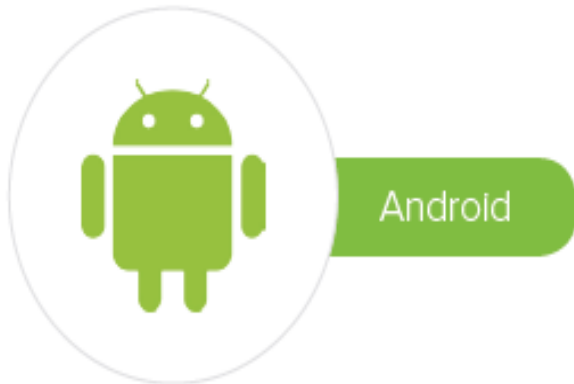
Our customers put fraud strategy into action with business rules that can reduce review queues. No two businesses are the same. What might be considered low risk by one company may be high risk for another. The power to customize business rules creates fraud solutions targeted to the unique needs of each company. This chart defines risk as a combination of mobile transactions that have either been denied or flagged for review.



TOP 5 FRAUDS BY DEVICE TYPE

Device reputation uncovers relationships between accounts and devices across all businesses within Iovation's multi-industry, global network of nearly 2 billion devices and 17 million confirmed instances of fraud and abuse.

This in-depth insight into previous fraud activity is extremely useful in weighing the risk of a transaction. It also reveals associations between devices and accounts that were previously hidden.



1. CREDIT CARD FRAUD
2. INAPPROPRIATE CONTENT
3. PROMOTION ABUSE
4. SPAM
5. ACCOUNT TAKEOVER



1. CREDIT CARD FRAUD
2. SPAM
3. TRUE IDENTITY THEFT
4. INAPPROPRIATE CONTENT
5. ACCOUNT TAKEOVER



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WHERE DOES MOBILE FRAUD LIVE?

Mobile application usage has clearly taken the lead over mobile web in the United States, garnering 86 percent* of the average mobile consumer's time. The majority of that time is spent on games and social networks.

It's interesting that Iovation's data shows high-risk transaction percentages are still greater on mobile web than mobile applications. When we compare Android and iOS mobile application transactions, Android is four times more likely to have high-risk transactions. This seems to support the industry consensus that iOS is a safer environment than Android, although no mobile device is completely risk-free.



MOBILE WEB 0.41%

MOBILE APPS 0.32%



MOBILE WEB 0.28%

MOBILE APPS 0.08%

The the exponential growth of the number of mobile applications requires apps to be accessible and contextual for users in all regions and markets ie apps that “*feel local*”. Further are a few of issues related to apps localization:

- **Dates** – Is the date January 1 or 1 January?
- **Characters** – Different languages have different set of characters
- **Postal codes** – In some countries postal codes contain letters, in others no.
- **Phone numbers** – Different formats for different countries
- **Written direction** – Some languages are written left to right, others right to left
- **Currency conversion** – Especially important for internet retailers
- **Tax calculation** – VAT and other taxes

Ta-Ta for now!