M-Commerce

Chapter · November 2016

DOI: 10.1201/9781315207353-7

1 author:

Fadi Safieddine
University of East London
58 PUBLICATIONS **281** CITATIONS

SEE PROFILE

CHAPTER 7

M-Commerce

Dr. Fadi Safieddine

[1]*The American University of the Middle East, MIS Department, Business College, Egaila, Kuwait. Email: fadi.safiedinne@aum.edu.kw*

ABSTRACT

M-commerce, a process of selling and buying using mobile devices, is and will continue to grow for the foreseeable future. The technology has it characteristics and limitations, but great opportunities for businesses as sales growth and new business models continue to outpace other technologies. Apps supported by app stores have provided an environment of trust for consumers; yet Web based M-commerce remains dominant with evidence that physical shops are using M-commerce to fight back. Still, the real business prospect in M-commerce comes from the opportunities to develop new business models and integrating new technologies where innovations and creativity is highly rewarded.

7.1 INTRODUCTION

M-commerce, or Mobile Commerce, a term derived from the Electronic Commerce with the focus on the ability to buy, sell, advertise and perform business operations on the move. The technology allowing such process is constantly developing and changing. Initially linked to laptops, M-commerce is now predominately associated with smartphones and tablets. More recently businesses have been eying opportunities in M-commerce in wearable technologies such as smart watches and smart glasses. Therefore, the main criteria by which a process can be categorized as M-commerce is the ability to use wireless devices for business transactions while on the move.

7.2 CHARACTERISTICS AND LIMITATIONS

Mobile commerce has characteristics that make it significantly different to E-commerce using desktops and laptops:

- Mobile devices tend to have limited space: a typical smartphone or tablet would have less than 10% storage space compared to desktops and laptops.
- Mobile devices also have significantly smaller display screens to allow easier mobility. This means the design of websites, apps, and applications for M-commerce needs to take into consideration what are the essential requirements needed to fit into these limited displays.
- Mobile devices need to operate on battery for longer hours. This feature is essential if the device to be considered to be true mobile. Long and continuous use of the processing power of the mobile devices would drain the battery.
- Limited processing power and processing memory Random Access Memory (RAMs). Typical mobile devices are not equipped to perform extensive processing as traditional desktops and laptops. The processer is designed to self-cool without the need for a fan to keep the mobile devices both slim and reduce the use of the battery. Thus many traditional applications could not run efficiently on mobile devices.
- Internet traffic on mobile devices needs to consider that many mobile devices would be using mobile network. Both the devices and the network cannot handle extensive traffic although the new generations of tablets and smartphones have been designed to handle faster and better Internet traffic at speeds now reaching 5G or 100GB per second.
- The operating systems on mobile devices have been designed not to be large and reduce its extensive use of the processor and RAMs. This has come at a cost in reducing the tools and options that would have been otherwise available in typical desktop or laptop.
- Mobile devices come with extensive features not found traditionally in desktop or laptop devices. Features include: high-resolution cameras, Global Positioning Systems (GPS), Near Field Communication (NFC), SMS messages, calling, and access to extensive libraries for application downloads known as Apps.

7.3 APPS AND APP STORES

7.3.1 DEFINITION:

The term apps is used to describe small applications which users use to download on mobile devices from specific App Stores associated with the operating system or phone devices they have purchased. Traditionally, applications required large storage and the installation had to undergo

several stages and authorizations from the system administrations. Risks have traditionally been associated with application downloads, especially when downloaded from the Internet with trust in the source of these applications always a concern. App stores have come about to limit and create an environment of trust. Apps tend to be compact, requiring less Internet traffic, requiring less processing power, and checked by the App stores to be legitimate. App stores check Apps for any unauthorized contains such as viruses, spyware or codes allowing unauthorized access otherwise known as hacking. Applications that pass these checks get the App store certifications and are authorized to appear on the App store. The App Store certification allows that specific operating system to authorize the opening of the App without asking for further authorization of the user.

There has been incidents, however, were computer viruses and hackers have been successful in getting unauthorized codes through legitimate App store apps [1], [2]. However, these incidents remain significantly rare.

Some of the most popular App stores are Apple App Store, Google Play Store, Samsung Apps Store, and Windows Store.

7.3.2 CATEGORIES OF APPS:

Apps are categorized by what they provide in digital services.

- Game Apps are games using mobile devices in which user interacts with the device in response to graphics on the screen. It may come as a surprise to many people that while Game Apps represent the biggest category of Apps; overall Game Apps represent less than 23% of the most popular Apps.
- Business Apps are second most popular and represent apps created by businesses to sell, buy, advertise, and maintain business operations. Examples of business apps would be supermarkets, shops and stores, restaurant chains, estate agents, suppliers' apps, companies providing comparison services, and more.
- Educational Apps represent around 10% and include academic tools such as dictionaries, translators, language learning, programming, calculators, word processors, spreadsheets, schooling, kids educational apps, academic establishment apps associated with schools and universities.
- Lifestyle apps include clothing apps, make up apps, food and cooking apps, dieting apps, dating apps, time management apps, and more.
- Entertainment Apps would include movies, TV, videos, podcast, digital radio and more. Traditionally, the process involved making a payment to acquire the entertainment package and the user would have access unlimited access to a copy. A recent trend is a move from buying to streaming. Streaming involves watching or listening to that

content only once or for a short period of time. This is the same business model associated with renting movies. Big names are found here like YouTube, Netflex, and Sony.

- The remaining categories are: Utilities for managing the running of mobile devices; Travel for flights, hotels, car rentals, and more; Books for digital reading; Health and fitness; Music for buying or streaming; Productivity for personal and business; Food and Drinks; Sports; Photo and Video recording and editing; Finance which includes banking, credit card, and financial management; News; Referencing; Social Media; Medical; and finally Navigation.

Below is a breakdown of the most popular apps in the Apple App store as reported by Statista website [3] for 2015.

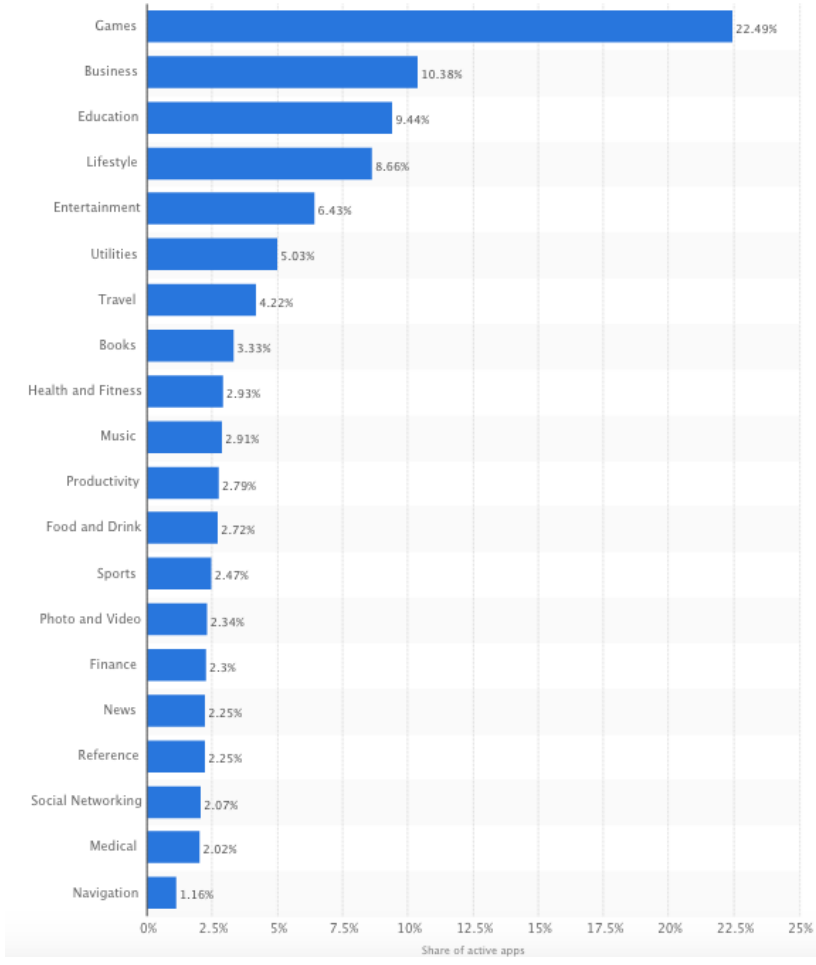

FIGURE 7.1 Most popular Apple App Store categories in December 2015, by share of available apps [3].

7.3.3 APP M-COMMERCE MODEL:

While some apps require an upfront payment to purchase them, the majority of apps are available for download free of charge. In-app purchases are, however, on the increase and are behind a significant portion of the sales reported by App stores. In-app purchases have two

popular options: subscriptions or digital purchases. After the free download of the app, the user finds some of the most essential or interesting features are locked. To unlock these features they would need to subscribe. Subscriptions could be either unlimited, set number of days or set number of uses. For example some dating apps would restrict user from contacting more than ten users a day or News app that only allows access to breaking news headlines for subscribed users. Some game apps have also used the subscription features but with limited success. The most popular means of payments for Game Apps are via digital purchases whereby to be able to win, get advantage tool, continue to play or the avatar the user is playing looks good the player would needs to pay. The business model for digital in-app purchases is very similar to arcade machines where to continue playing the user has to 'insert a coin'. This proved to be successful in highly competitive games. In-app purchase have also been utilized in all the app categorized listed earlier. Giving users the chance to try the application or try some of the useful features proved to be an inducing technique to encourage users to make digital purchases.

7.4 M-COMMERCE BUSINESS MODELS

While in E-commerce there are variety of business models involving combinations of Business, Consumers, and Government, in M-Commerce only four combinations are deemed significant enough. While Business to Consumer (B2C) remains the most predominant model, we will also explain three important models: G2C, B2B, and C2C. Other models will be summarized, as their impact and existence remains very limited.

- **Government to Consumer (G2C)** M-Commerce is growing in presence. Nowadays governments are keenly aware of the expanded use of mobile use and several governments have moved several of their services and payments to accommodate such model. Some of the G2C models that have been adopted include council tax, service payments, traffic penalty payments, and tax calculators.
- **Business to Business (B2B)** M-commerce is also slowly expanding as business move to capitalize on existing and new supply chain management systems that connects them better to their business partners. Dedicated apps are designed to partly replace some of the Web features that would accelerate order processing, track delivery, and keep business partners informed of their latest news, services, and products.
- **Consumer to Consumer (C2C)** represents a significant portion of M-commerce as more independent consumers are able to sell to each other using Mobile devices. Here traditional models in E-commerce copied into apps have proven to be as successful. Auction apps and consumer selling outlets such as ebay, gumtree, Graiglist, and even

some social media apps such as Instagram have been use to facilitate C2C M-commerce.

- **Business to Consumer (B2C)** represent by far the most significant portion of successful M-commerce models. Businesses selling to Consumers via M-commerce has also introduced rather new areas of business which may have not been possible traditionally online. Having apps that sell goods would represent the traditional E-commerce model in the form of an app. However, M-commerce introduced a rather surprising explosion of digital goods that were traditionally not as successful on desktops. M-commerce has open new prospects in games, music, videos, productivity, entertaining, and educational apps bring in new business models. Opportunities to utilize a rather very different device that has much higher communication value to consumers. Also a device that has a much higher portability as an entertaining and socializing tool that laptops and desktops. Business to Consumer apps are also able to make use of integrated cameras, GPS, and instance notification (or push messages) which otherwise would not have been possible before – See Uber Case Study.

Uber Business Model:

Uber is an example of a highly profitable M-commerce business model that has built its success around mobile communications and mobile devices.

The smartphone app, which is free to download, provides on-demand transport service to users by connecting mobile users to taxi drivers. Taxi drivers register onto the service and they are required to have valid permits as well as their own cars. Users use their mobile phones, the built in GPS and Internet connection to locate nearby taxi drivers. Taxi drivers would be using an iPhone mobile device provided by Uber with GPS and Internet connection to let Uber know their availability and location. Upon a request arriving, the system would direct the nearest (or cheapest) service to the user so there is value to users to use Uber. Uber gets 20% of all the fares that can only be paid using the passenger's credit card.

UBER

FIGURE 7.2 UBER Logo [4]

This service is available in nearly 300 cities across 55 countries [5]. Despite only starting in 2009, the company value is estimated to be as much as $62.5 Billion [6].

Key to the success of the Uber App is having user-friendly app, fast responsive servers, utilization of the mobile device, having no competition and thus developing their brand and image. However, the

company has had to battle several high court cases regarding its service and impact it has had on established taxi services as well as high profile cases regarding the company's vetting procedure when enrolling taxi drivers.

Uber took advantage of free market economy and was not afraid to disrupt other business models. Provided efficient service that customers' value.

Uber also represents a unique case as there is some debate as to which M-commerce model it fits into. At first instance, Uber appears to be Consumer to Consumer model (C2C) since the taxi drivers are also consumers of Uber Service by being charged 20% of the fair. This matches in some aspect what Ebay does when it charges the seller for selling items via its app or website. However, Uber also vets and checks drivers before they are enrolled, and there has been suggestion that it actually acts as an employer. Thus they should be liable to national insurance tax, employer tax, and local tax usually expected to be paid by local businesses. If this is so, then Uber becomes Business to Consumer model (B2C). This has been already the debate of several court cases where local authorities and business have sued Uber for tax evasion, unfair competition, and in some occasion responsibility of negligence by their vetted drives [7].

7.5 BUSINESS OPPORTUNITIES IN M-COMMERCE

Business Opportunities in M-Commerce are expending as the demand on portable and mobile computing continues to grow beyond the market of smartphones to wearable technologies with implants predicted shortly after. We will start by presenting where the opportunities are still growing and where new opportunities are expected.

- **Digital goods:** Digital goods are still a growing market in M-commence represented by sale of Apps. Games, sold through the App stores, represent the biggest portion of digital goods sold for M-commerce. The Wall Street Journal reports that Apple App Store recorded $20 Billion for 2015 [8]. Other digital goods included here were explained in the 'Categories of Apps' sections include: Entertainment, Music, Books and more.

- **Digital Services:** A growing market of providing services that generates sales from social media advertising, communication apps, and call over network. Skype, for instance, while provides free video calls and voice of network calls, they charge for calls to landlines. Other services have proven to help retain customers and attract new customers are business apps such as M-banking, Grocery Sales,

Auction apps, and business directories. It should be noted that convenience plays a key role here. Some of the successful digital service apps have capitalized on making the service convenient to customers, example Uber. Commodities, clothing and grocery sales, are having limited success.

The following are technologies presenting new business opportunities to M-commerce.

- **Tablet market:** This represents a key change in M-commerce. For long the limited screen size presented a limitation for many users when buying or selling online. For many users, there simply not enough space on a smartphone to view and cross reference prices. So when shopping for commodities of high value, users tend to resort to desktops and laptops. Tablets with larger screen sizes are, however, partly resolving this problem and may well be presenting new opportunities not identified before. Tablets could contribute to the growth in sales in productivity apps, product/service comparison apps, commodities sales apps, and many applications that traditionally would have been only available for desktop and laptop users.

- **Retailers fighting back:** Physical stores are continuously looking for ways to support online sales in a way that would give them advantage over virtual stores. Same-day shipping or delivery means customers are getting the benefits of physical store while buying online. In-store pickups or online reservation, is another example on how m-commerce is mixing online and offline worlds. Customers pay for an item, knowing that they can drive by and pick it up. This gives them faster shopping and assurance of finding what they came for. Store location information is another advantage that retailers are using to attract users ensuring they are picked up by apps such as Google Maps. Retailers are using geo-fencing, or providing offers and reminders to people who are nearby, to attract customers. Starbucks did this through its app and Apple passbook. Paypal introduced mobile store payment whereby users open the Paypal app with GPS indicating nearby stores that accept Paypal mobile store payment along with promotions and offers.

- **Cloud Computing:** The ability rent software and even hardware services over the Internet is providing opportunities for business and users to benefit from it. B2B and B2C cloud computing services include software rental otherwise known as Software as a Service (SaaS); storage and back up facilities otherwise known as Infrastructure as a Service (IaaS). For businesses already using cloud computing, being able to use Mobile services to do business on the

more or get remote access to these applications presents an important business opportunity. Noted here that several app stores provide their own Cloud Computing storage and back up facilities with the first few Giga bites free but additional space at a cost. Also several apps have started witnessing opportunities in including cloud-computing services to back up images, communications, and documents.

- **Wearable technologies:** Wearable technologies are defined as computers we can wear. Recent successes include smart watches and smart bands. Additionally, with limited successes there have been smart glasses, smart necklaces, smart shoes and even smart rings. Developers are finding ways to allow these devices to communicate with smart phone thus introducing new markets for M-commerce in the form of specialized apps. For example with smart watches and smart bands, and array of health and lifestyle apps have been designed to utilize GPS, Internet access and communication needs of users to allow personalized health advice, workout routine, which include detailed suggests and targets.

- **Virtual Reality headsets:** Virtual Reality headsets allow users to interact with world that is virtual yet appears realistic. Unlikely technology to be features in M-commerce, however many headsets and mobile companies use smartphones to delivery virtual reality and with that new opportunities for businesses. Virtual reality games, tours, product reviews, news reporting, training apps, educational apps, advertising, and more. Even Virtual reality headsets with built-in devices are expected to have app store access and thus present new M-commerce opportunities.

- **Self-drive cars:** Whether it is Apple, Google, or Mercedes; self-driving cars will bring along wireless connectivity to the Internet and with it will be a new era not only for driving but also for M-commerce. New business ideas that are able to attract driving customers will have significant advantage in areas of digital goods, digital services, sales and advertising are yet to be explored.

- **Airlines:** Internet access on airplanes and use of tablets as entertainment displays are already a reality for many airlines. Business opportunities here are under utilized in form of communication tools, digital goods, onboard sales, and duty free sales at destination airports, as well as advertising. The future will likely witness economy air passengers getting access to some entertainment, yet additional or more premium entertainment available as pay-per-view.

- **Others:** Smart Televisions, Smart fridges, Smart cameras, and the

Internet of things are yet to open new M-commerce opportunities that are to be discovered.

7.6 MOBILE WEB COMMERCE FOR RETAILERS:

Despite the vast sales reported by App stores, mobile Web commerce continues to outpace mobile app for M-commerce. In fact, according to Forrester Survey report [9] on consumer behavior in the US showed consumers prefer using retailers Web applications via their mobile phones as opposed to the retailers' apps. This includes locating stores, reading reviews, comparing prices, purchases, product availability, and learning about promotions. In fact, the only categories where consumers used retailers apps more than the website are using store-loyalty cards and paying for products to be collected from the store. Thus suggesting that only loyal customers are the ones who tend to use businesses' apps.

7.7 SUCCESS FACTORS IN M-COMMERCE

Some key success factors for business M-commerce models remain essentially similar to success factors in E-commerce websites although M-commerce still has its own challenges.

- **Trust in the source:**

  The source of such applications is important. The app stores rigorous checks may seem quite daunting for new app developers but this is essential part of the trust that users will have in their app. Another supportive element of going through app stores is that they act as financial cybermediary in almost all the transactions. Financial cybermediary is the definition given to companies that facilitate online financial transactions such as Paypal. However, in the world of M-commerce, Paypal is facing increasing challenges in dominating the M-commerce market. Under the app store payment model, users do not pay directly the developers of these apps. Instead, for small operational fee deducted from the seller, the transactions are authorized by the App store. This provides trust in the security of the sale offering one the most important key success factors for many M-commerce businesses and app developers. While this has been great feature to many, it has not been the case for some well established business that would have preferred the transactions to go directly through them directly. For Amazon, as an example, this process created additional cost for sale of digital books for users using Kindle via Apple iTune Store or Google Play Store. At the time of writing this chapter, Amazon required iPad and iPhone users to pay for digital books on the Amazon website first before getting access to the books via the Apple device. A not so practical approach for many digital books readers.

- **Value for Effort (VfE) versus Value for Money (VfM):**

Success factor in M-commerce apps has to factor in Value for Effort, Value for Money, or combination of both. Value for Effort (VfE) could be described as providing convenience to the users. Where an app can replace tedious or time-consuming process, this presented a key success factor. Several examples of business apps fall into this category including Banking Apps that allow faster access to banking details and performing banking transactions on the move. Increasingly, users prefer using an app to calling or going online via websites for orders and services. Apps such as Just Eat™ and Hungry House™ are such Apps allowing quick and easy way to order takeaway food based on the GPS location of the user and reviews of previous customers.

Value for Money (VfM) apps represent much of the success factors that E-commerce websites have done for nearly a decade. Where an app can provide users a better value for purchases of products or services, this became a key success factor for that business model. Companies have struggled to sell high end products at better value via M-commerce and this remains a market to explore.

The majority of successful M-commerce apps have come about as mixture of VfE and VfM. Taxi ordering app (Uber), Auction app (Ebay), Books, Music and Films are all examples of M-commerce attracting customers using a mixture of both VfE and VfM.

In fact one of the key reason many websites failed initially to capitalize on the expansion of M-Commerce is that they assumed the same E-commerce models would work for M-commerce. Travel, grocery, clothing, computing, insurance, and many other products and services have not successfully broken into the M-commerce market due in part for not providing anything significantly different to their website. Storage and screen limitations, along with slower speed and processing have rendered many of these apps only to be used when far from laptops or desktops.

7.8 RISKS ASSOCIATED WITH M-COMMERCE

Since smartphones, tablets, and what will come later in form of wearable technologies are in essence processing computers connected to the Internet that provide mobility, it is then no surprise that almost all the traditional risks associated with computers and E-commerce reappeared in M-commerce. However, some risk aspects have been amplified by the mere nature of the technology and its mobility. So while viruses, worms, spam, phishing, pharming, and snooping are computer crimes that have reappeared in smartphone, the three major risks associated with M-Commerce has come from Hacking, Privacy, and Identify Fraud.

From an M-business and M-commerce point of view, hacking has

been a key risk challenge. Businesses need to keep their app light and servers fast to provide faster responsiveness while maintaining encrypted communications, firewalls and anti-viruses, a challenge proven to be both difficult and costly.

Invasion of privacy is yet another risk associated with M-commerce, specifically since the mobility that comes with the devices presents a risk for users and companies where sensitive data could be abused or lost all together. While some companies have resorted to ensuring business tablets and mobile phones are fitted with apps that enable them to remotely wipe the device memory out to protect such details from falling into wrong hands, the cost of lost data is somewhat harder to quantify. Other aspect of privacy comes from spyware and concerns companies or governments tracking users and their communications.

Finally, identify theft for businesses and individuals are rather amplified where a device falls into the hands of criminals allowing access to personal details, banking information, and contacts giving a rather unprecedented amount of information for abuse all in one place.

7.9 SOFTWARE OF M-COMMERCE:

Building an app requires planning, analysis, design, development, testing, and implementation and is very much similar to developing any software application. However, there are two ways to building a business app: software coding or platform builders, with each way having its own benefits and limitations.

Software coding of apps could be done using the specific app store recommended language and library, this is usually termed as native app. Android stores welcome Java or C# coding while Apple store require apps to run on iOS or X OS using integrated development environment called Xcode. Both native app languages give developers access to library of codes that result in apps that have faster performance and higher reliability. Naturally, native apps tend to be more expensive to build and a business may need to build several apps to match each app store or mobile devices' need. However, having apps that go through the App stores provide trust and assurance of quality for users.

Coding apps could be done using HTML5. HTML being the language to build websites thus these apps are termed as a Web apps. The developers using HTML5 are able to run these apps from all app stores but this comes at a cost. The reliability of the performance will depend on the Internet connection and while the designers can install many of the app features in case the user

decides to use the app where there is no Internet, the speed and reliability of such app is not as reliable as native apps.

Platform app builders are now flourishing market for small to medium size businesses providing platform to design business apps with predefined pull-and-drop features. Provided a business is seeking a presence with some standard selling features, these platforms would also provide faster approval process to apps stores. The success, thereafter, falls on that business to target its customers to use such platform as oppose to vising in person, using the website or calling. Example of app development platforms are: AppMakr, AppMachine, Appy Pie, Good Barber, and Appery.io.

7.10 CONCLUSION:

The world of M-commerce has and will continue to capitalize on the convenience as the technology gets more powerful and devices become more portable. Exciting developments in artificial intelligence and quantum computing promises a decade or more of great innovation. And if the last two decades have shown us anything, combining innovation and creativity into new business models are behind some of the biggest successes we see today.

KEYWORDS

- **M-commerce**
- **E-commerce**
- **App**
- **Apps store**
- **Web Mobile**
- **Mobile Technology**

REFERENCES

1. Felt A.P., Finifter M., Chin E., Hanna S., and Wagner D. A survey of mobile malware in the wild. SPSM '11 Proceedings of the 1st ACM workshop on Security and privacy in smartphones and mobile devices, 3-14.

2. Sanz B., Santos I., Laorden C., Ugarte-Pedrero X., Bringas P.G., and Álvarez G. PUMA: Permission Usage to Detect Malware in Android. International Joint Conference CISIS'12-ICEUTE´12-SOCO´12 Special Sessions. Volume 189 of the series Advances in Intelligent Systems and Computing pp 289-298.

3. Statista, (December, 2015) Most popular Apple App Store categories in December 2015, by share of available apps. Downloaded from the Internet on14th January 2016 at http://www.statista.com/statistics/270291/popular-categories-in-the-app-store/ Statista,

4. Wikimedia (2016|) UBER Logo. Download from the Internet on 12th of March 2016. https://commons.wikimedia.org/wiki/File:Uber_logo.svg

5. "Cities across the world." Uber.com. Retrieved May 26, 2015. https://www.uber.com/cities/

6. Newcomer, E. (3 December 2015). "Uber Raises Funding at $62.5 Billion Valuation – The ride-hailing company is said to seek $2.1 billion in a new funding round." Bloomberg News. Retrieved 3 December 2015.

7. Wikipedia (n.d) "Legal status of Uber's service". Download from the Internet on 12th of March 2016. https://en.wikipedia.org/wiki/Legal_status_of_Uber%27s_service

8. Wakabayashi, D. (Jan, 2016), Apple's App Store Sales Hit $20 Billion, Signs of Slower Growth Emerge. The Wall Street Journal (online). Download from the Internet on 11th of March 2016 at http://www.wsj.com/articles/apples-app-store-sales-hit-20-billion-signs-of-slower-growth-emerge-1452087004

9. Forrester Consulting (August 2015) "The state of Mobile Apps for Retailers". Download from Internet 13th of April 2016 at: http://www.retailmenot.com/corp/static/filer_public/78/9c/789c947a-fe7c-46ce-908a-790352326761/stateofmobileappsforretailers.pdf