



The Future of Mobile Data

A framework for designing successful mobile data offerings



The mobile data consumption is rapidly growing. To capitalize on this market without compromising the consumer satisfaction, mobile operators should provide market specific solutions that fit their strategic positioning. This paper presents a framework based on global trends and market factors that can assist operators to launch new or improve already existing mobile data offerings.

Key words: Mobile data, Infrastructure, Mobile Growth factors, Mobile Network Operators, Offering solutions

Executive Summary

In order to satisfy the increasing demand in consumer expectations, regarding both reliability and speed of the mobile connections, mobile networks are constantly growing and becoming more technologically advanced. This growth has resulted in a significant increase in operational costs for running mobile networks. Therefore, Mobile Network Operators (MNOs) have to find new ways of maintaining the desired level of profitability without compromising the consumer satisfaction.

This paper develops successful offerings within mobile data industries. The analysis operates on three different levels: the global, the national and the conceptual level. **The global level** looks into important trends that will shape the industry in the near future, where the most relevant trends are: the rise of OTT services, tiered pricing and traffic offload.

The national level introduces six Mobile Growth factors: economic development, consumer behavior, network coverage, fixed line penetration, mobile network penetration and mobile phone penetration - where the last four constitute an infrastructural index. The analysis is conducted within three markets with different characteristics: USA, France and Egypt.

The conducted analysis indicates that consumer behavior is correlated with the economic state of the market. In more economically developed markets, consumers access mobile networks by means of many short sessions that are not data intensive, while consumers in less economically developed markets use fewer and longer sessions that are data intensive. The offerings should therefore be adapted after the specific consumer behavior within the markets.

The conceptual level utilizes the insights from the previous two levels in order to present a framework that can be applied to any properly analyzed market, and constitutes the primary outcome of the research. The framework is based on two steps: (1) a market analysis based on the consumer behavior and the infrastructural state, and (2) an analysis of the company's strategic positioning. It provides a number of insights and solutions associated with the company's offerings.

The presented solutions in the framework are connected to the global trends. In markets with high network coverage, OTT cooperation and tiered pricing are relevant in more economically developed markets and less economically developed markets respectively. In markets with low network coverage, tiered pricing should be applied. Where the fixed line penetration is higher than the penetration of mobile network, Wi-Fi offloading should be applied. Bundled offerings, with device diversification, should be offered in markets where the fixed line penetration is lower than the mobile network penetration.

The presented framework will allow management to properly analyze markets and design offerings that can increase profitability without decreasing consumer satisfaction.

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Introduction

In order to satisfy the increasing demand in consumer expectations, regarding both reliability and speed of the mobile connections, mobile networks are constantly growing and becoming more technologically advanced. At the same time, due to the high availability of numerous Over-The-Top (OTT) services - such as Netflix, Spotify or Skype - consumers and content providers expect an access to the high quality mobile networks. However, with the growth of data consumption and increasing bandwidth, the overall operational costs associated with running mobile networks significantly increased over the last few years. Therefore, MNOs have to find new ways of maintaining the desired level of profitability without compromising the consumer satisfaction.

The purpose of the following report is to define successful offerings within the mobile data industry. To achieve this, the paper aims to investigate the most prominent factors that mobile network operators should take into account while launching their offerings, in order to provide solutions which can be applied to markets with diverse economic and infrastructural conditions.

Area of research

The following research operates on three different levels. On a global level, it defines trends relevant to the industry. On a national level, it provides market specific insights and defines successful offerings. On a conceptual level, the insights from the previous two levels are utilized to form a framework based on market situation and company specific strategic positioning.

“MNOs have to find new ways of maintaining the desired level of profitability without compromising the consumer satisfaction”

The research operates on three different levels:

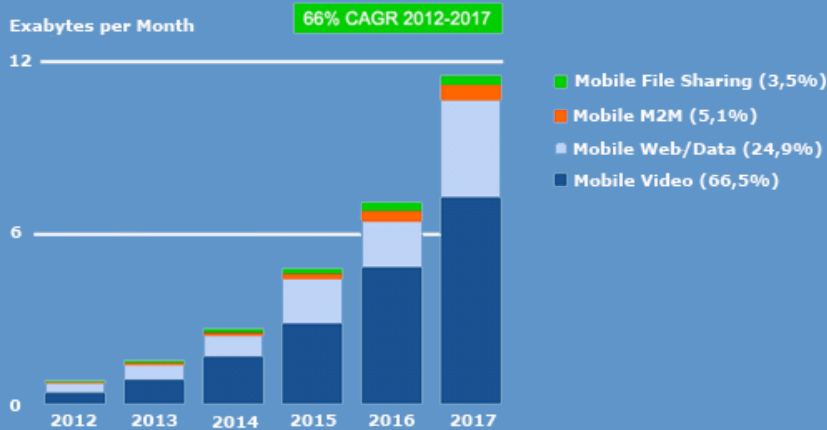
Global

National

Conceptual

Global level

The Continued Rise of OTT Services



75%

is the expected growth of mobile video from 2012 to 2017.

66%

of all data traffic will be generated via OTT services in 2017.

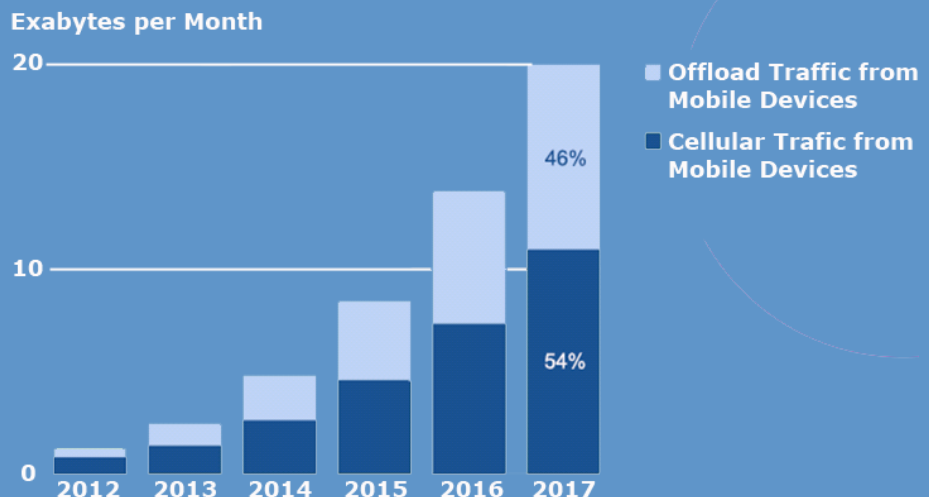
Traffic Offload from Mobile to Fixed Networks

1.5 Billion

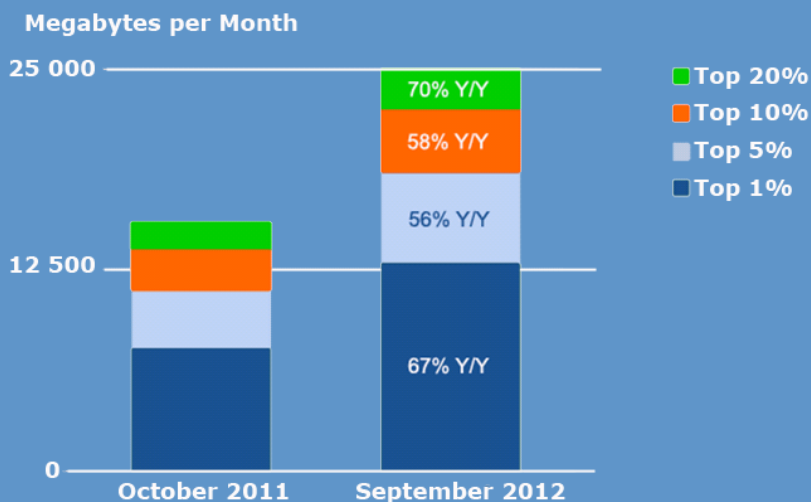
devices sold in 2012 are Wi-Fi connected.

46%

of total mobile data traffic will be offloaded in 2017.



The Impact of Tiered Pricing: Shake-Up at the Top



Constraining the data usage for the top

1%

while increasing the data usage for the top

20%

Global Trends

The following trends are global mobile data drivers that management of MNOs should take into consideration when tailoring mobile data offerings in the present and for the future. Several trends have been analyzed in regards of relevance and importance for the case, resulting in an isolation of eight trends that are to be considered as important - with three of key importance. These three trends are mentioned in this part whilst the other five are briefly mentioned in the appendix.

The Continued Rise of OTT Services

OTT Services such as YouTube, Skype and Netflix are on the constant rise (ACG Research 2012; Pelson 2012). As these services stream content consisting of video and/or audio, they require vast amounts of data and error-free transmission in order to work properly. They are also marketed in a way where the service is supposed to be available everywhere and on all kind of devices. Needless to say, the trend puts huge pressure on MNOs in regards of delivering mobile data. Mobile Voice over IP (VoIP) services, such as Skype, are also reducing the need for “regular” phone calls. The race for market share from a global perspective is still in an initial phase.

Due to the much higher bitrates than in other types of mobile content types, mobile video services will generate a huge portion of the overall traffic growth through 2017. According to Cisco (2013), mobile video will grow at a Compound Annual Growth Rate (CAGR) of 75% between 2012 and 2017, which makes it the highest growth rate of any mobile application category.

Another traffic-wise classification includes the division between the mobile cloud traffic and mobile non-cloud traffic. Since many Internet video applications can be classified as cloud applications, mobile cloud traffic will be subjected to the growth curves similar to video. Cloud-based applications and OTT services allow to overcome numerous limitations of mobile devices. As more data can nowadays be stored and processed on servers, there is no need to carry as much data on physical means of storage or to perform all the operations on the device. Thus, thanks to OTT services and cloud-based applications, mobile

75%

is the expected growth of mobile video from 2012 to 2017.

66%

of all mobile data traffic will be generated via video services in 2017.

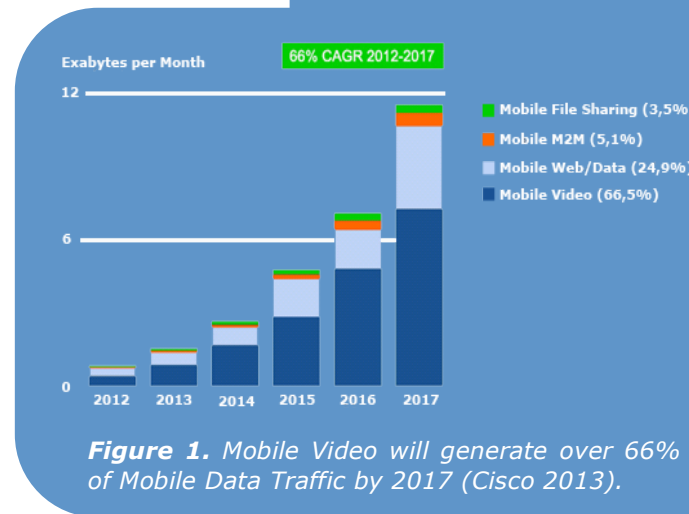


Figure 1. Mobile Video will generate over 66% of Mobile Data Traffic by 2017 (Cisco 2013).

devices can be turned into proper media consumption devices despite their hardware limitations.

Traffic offload from Mobile Networks to Fixed Networks

One way to tackle the increasing use of mobile data is to offload the traffic from the mobile networks to fixed networks through Wi-Fi (Cisco 2013; Ericsson 2012; Hetting 2013). As the usage of Wi-Fi connected devices continues to grow, this drives increasing penetration for Wi-Fi as well (Ericsson 2012). The number of Wi-Fi connected devices sold in 2012 alone exceeded 1,5 billion, which is nearly twice the number of devices sold in 2011 (Hetting 2013). It should be also of great interest for MNOs to further increase the Wi-Fi penetration in order to be able to provide satisfying mobile data connections. Both because of the pressure on GSM and LTE, but also because of the much better quality of connection in comparison to GSM. It is also more costly to build and maintain GSM and LTE stations than implementing Wi-Fi (Hetting 2013).

Globally, 33% of total mobile data traffic was offloaded onto fixed networks through Wi-Fi or femtocell in 2012. This could be translated into a monthly offload of 429 petabytes. This is projected to increase to a monthly offload of 21 exabytes of data traffic by 2017 which can be translated into a mobile offload rate of 46%. Without Wi-Fi and femtocell offload, mobile data traffic would grow at a CAGR of 74% between 2012 and 2017, instead of the projected CAGR of 66%. (Cisco 2013)

Another interesting aspect is the concept of Hotspot 2.0, which is about making a usable system for Wi-Fi roaming, just as easily as cellular roaming (Hetting 2013). This is already in the making across continents, but raises issues such as increased power-consumption, and privacy and legality when it comes to connecting to new Wi-Fi networks in an automated fashion (Ibid).

1.5 Billion

devices sold in 2012 were Wi-Fi compatible.

46%

of total mobile data traffic will be offloaded in 2017.

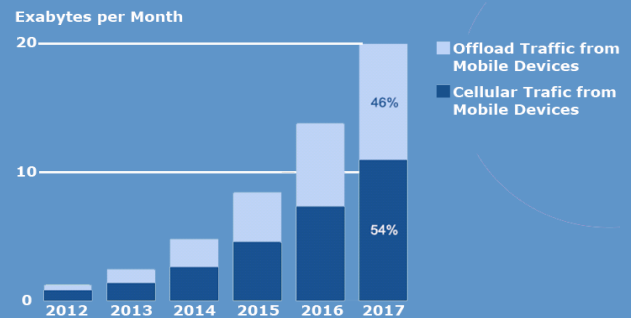


Figure 2. 46% of Total Mobile Data Traffic will be Offloaded in 2017 (Cisco 2013).

The Impact of Tiered Pricing – Shake-Up at the Top

According to a 3-year long study carried out by Cisco (2013), the percentage of tiered plans increased from 4 to 55%, while unlimited plans dropped from 81 to 45%. However, this has not constrained the usage patterns. From 2011 to 2012, average use per device on a tiered plan increased from 425 MB per month to 922 MB per month (rate of 117%). At the same time, usage per device on unlimited plans grew at a slower rate from 738 MB per month to 1.3 GB per month (71% rate).

The findings indicate that the tiered plans are effective. They are designed to constrain the heaviest data users and their introduction still results in a general increase in consumption of mobile traffic due to the increased consumption of services such as YouTube, Facebook or Netflix. Unlimited plans, that used to be more popular a few years ago, promoted the adoption of mobile applications and increased the usage of mobile broadband.

Interesting to note is that the top 1% of mobile data users has decreased their share of the total amount of data traffic from 52% in the beginning of the study, to 16% by the end (Figure 3). The top 20% of mobile data users also went down from 79 to 71% of the monthly traffic. The usage of the top 20% is however growing more rapidly than the top 1%, resulting in an overall growth of the mobile traffic while constraining the top 1% of users (Figure 4). The Proportion of mobile data users generating more than 2 GB:s per month has increased significantly throughout 2011 and 2012, reaching 18% of users in the end of 2012 (see appendix, Figure 28).

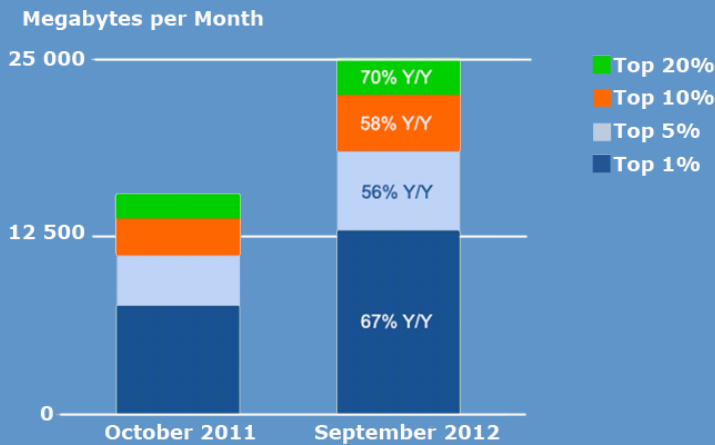


Figure 4. Top 20% growing at a faster rate of 70% year-to-year (Cisco 2013).

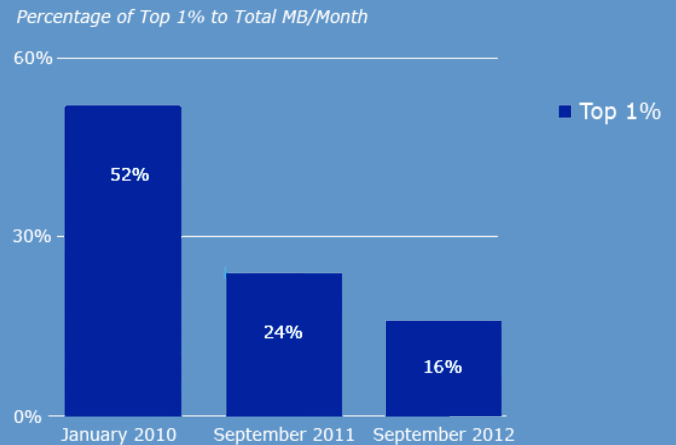


Figure 3. Top 1% generates 52% of monthly data traffic in Jan 2010, compared to 16% in Sept 2012 (Cisco 2013).

Trend contribution

The global trends described above will be taken into account when creating the solutions in the conceptual framework presented later in the report. As mentioned in the introduction, they are considered to shape the future of mobile data usage, hence their importance for the tailoring of offerings.

It is also important to recognize that these trends are interrelated - one affects and relates to the other. Therefore, evaluation of a single trend, without taking into account the remaining ones, can prove to be challenging. This can be, however, viewed as an opportunity, as it is possible to spot patterns that apply to the majority of trends. A key pattern that the trends illustrate is that mobile data will increase in both size and modes of usage and that, consequently, it is important for the MNOs to find new ways of coping with these changes. This can be achieved by both finding new innovative pricing strategies for offerings as well as offloading users from the mobile networks.

“It is also important to recognize that these trends are interrelated - one affects and relates to the other”

National level

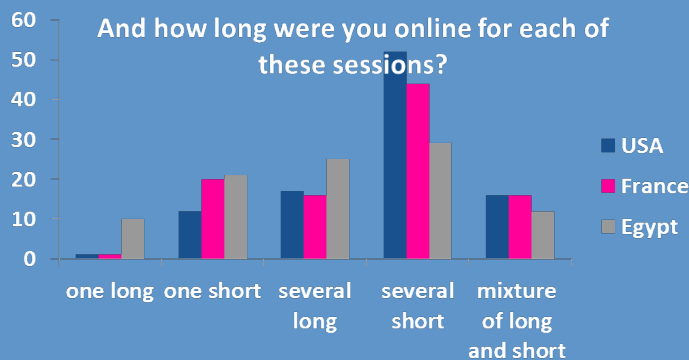
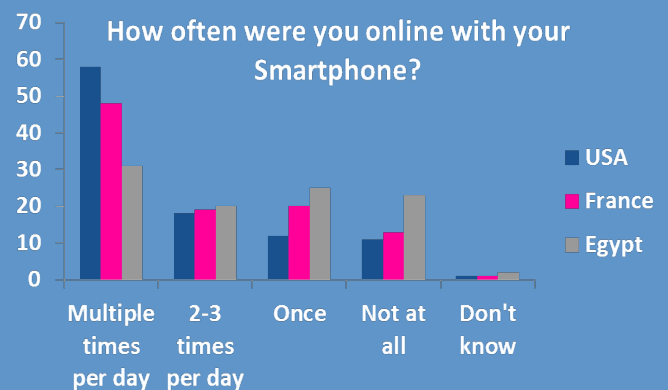
	Multiple	Unlimited	Prepaid	Others
USA	X	X	X	X
France		X	X	
Egypt		X	X	X

Unlimited offerings are offered by all operators on all three markets.

In both France and Egypt, blocked subscription plans exist.

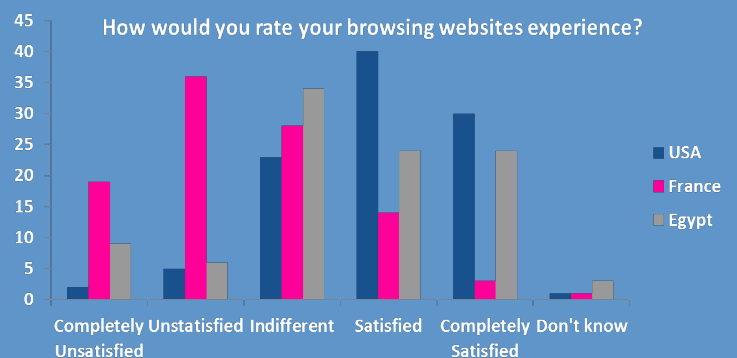
USA is the only market where multiple device offerings exist.

More economically developed markets' consumers are frequently online but their activities require less data.



Less economically developed markets' consumers are less frequently online but their activities require more data.

There is no correlation between network infrastructure level and satisfaction. But there is a clear pattern between expected infrastructure and satisfaction.



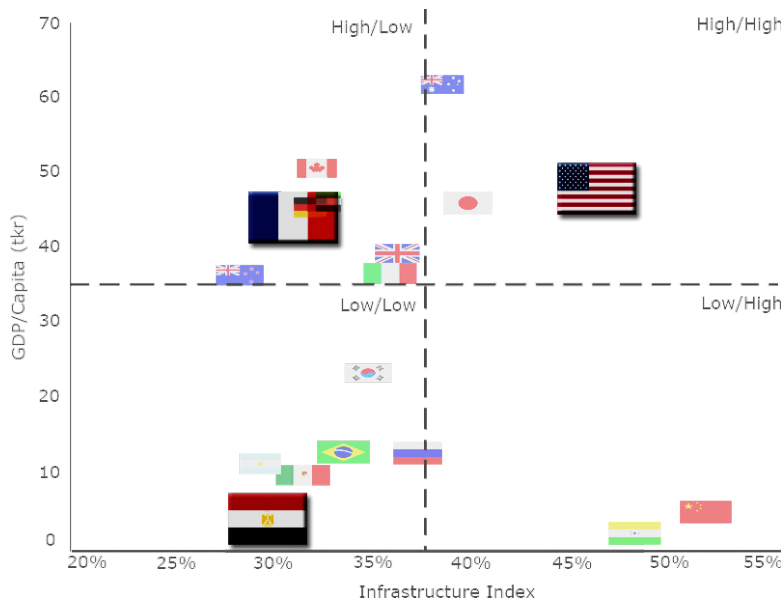
National analysis

The narrowing of the research area is mainly data driven and originates from six factors behind mobile growth. These factors have been defined in consultation with experts in the research area (Markendahl 2013). The defined Mobile Growth Factors are: economic situation on the market, network coverage, fixed line penetration, mobile broadband penetration, mobile phone penetration and consumer behavior.

As the economic situation on the market is a general factor, not only concerning the mobile industry but the country in general, the impact on this factor from changes in the industry is limited. This factor is therefore static in relation to the industry. The factor is measured by the use of GDP/capita, with data from the World Bank, to eliminate the impact of country size.

The network coverage and the different types of penetration (fixed line, mobile infrastructure and mobile phone) are combined to one variable for analysis: infrastructure. The data is collected from MasterCard Worldwide, where their index for infrastructure is adjusted to only include factors relevant to the industry (MasterCard 2012). The factors included in this modified index measures the infrastructure of the mobile phone industry by looking at factors such as mobile phone penetration, network coverage, mobile phone subscriptions and annual investments in the telecom industry.

The two variables mentioned above are used as the basis of market selection through an economic state/infrastructure matrix, where GDP/Capita is applied to the y-axis and the infrastructure index is applied to the x-axis. The consumer behavior will then be discussed in order to explore how the factor influences offering success within a market.



The chosen markets for further analysis are:

USA

France

Egypt

Figure 5. Country position based on GDP/capita and infrastructure index (MasterCard 2012; WorldBank 2012).

The chosen markets for further analysis are: USA, France and Egypt. These markets are selected as they have different positions when it comes to the relationship between the two variables. Egypt has both a low GDP/Capita and a less developed infrastructure. France has a high GDP/Capita but has a low level of infrastructural development in relation to their economic development. USA scores high on both variables. By choosing these three markets with different constellations of the two variables, the underlying factors for successful offerings can be put in relation to the consumer behavior and the global trends. Within these markets, a numbers of different operators offer different subscription plans. The most prominent operators, defined as the three largest when it comes to market share, and their offerings are discussed below.

Country characteristics

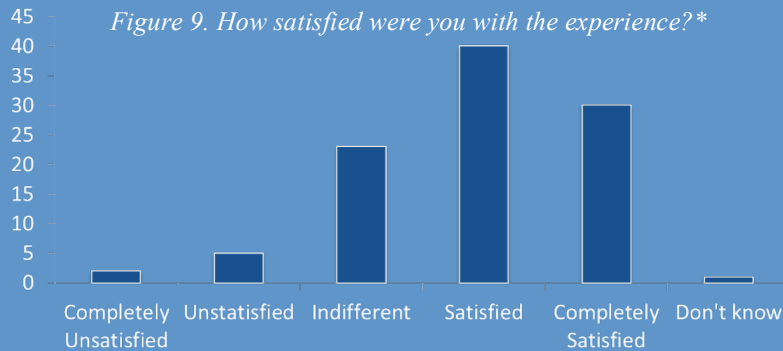
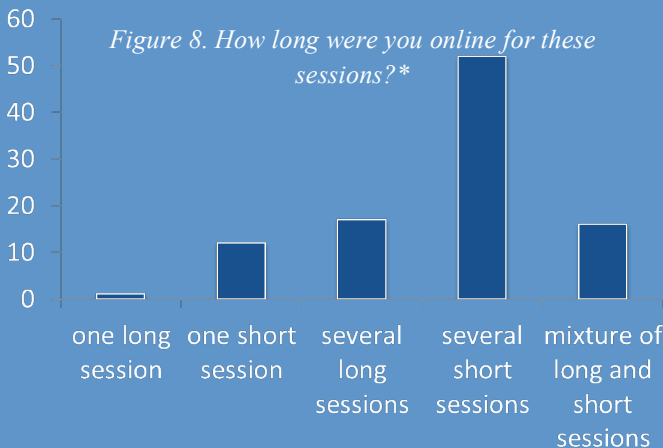
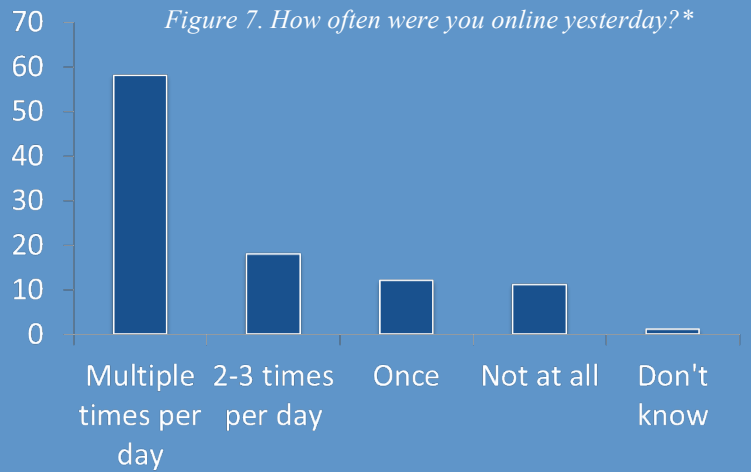
The three countries are first described from their current market picture, given by the current offerings, followed by an analysis of the consumer behavior within the country. The findings are then put in relation to one another and the insights are strengthened by the analysis of additional countries.

USA

USA

	Family bundle	Connecting devices	Unlimited voice/text - capped data	Pure unlimited	Prepaid - Use sum	Prepaid - use specified data	Prepaid - Spec. time period	Capped Blocked	Tablet offers	Only email
	Multiple	Unlimited	Prepaid	Others						
AT&T	x	x	x			x			x	
Verizon			x		x	x			x	
Sprint	x	x	x	x					x	

Figure 6 – Offerings from the three major actors on the American market (AT&T 2013; Verizon 2013; Sprint 2013).



*Our Mobile Planet 2012

Current market picture

The three main actors on the US market are: Verizon Wireless, AT&T and Sprint Nextel corp. All three companies are considered to have successful businesses, tailoring their offerings to the market in which they are active.

Within the US, a common standard for offerings exist, where *Unlimited offerings*, *Family bundles* and *Pre-paid solutions* are offered by all major actors. Concerning pure data plans, aimed towards tablet users, pre-paid plans are the most common. When a customer uses this type of plan they pay in advance for a set number of GB. Another common offering towards tablet users is to offer multi-device connections. This, most often, takes the form of a bundled offer for both smartphone and tablet usage. (AT&T 2013; Verizon 2013; Sprint 2013)

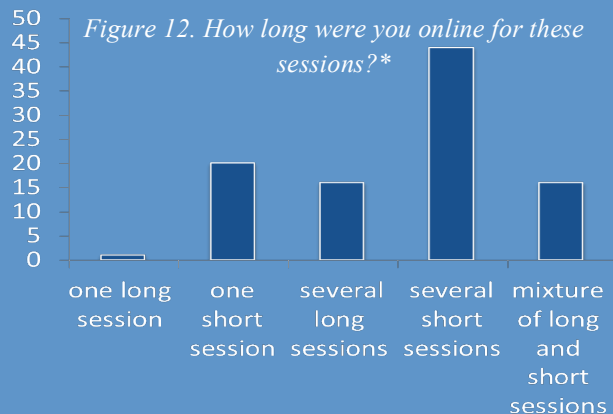
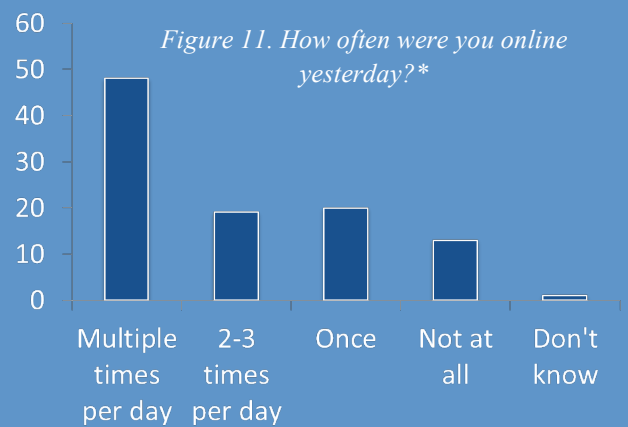
Consumer analysis

In the US smartphones have a penetration rate of 44%, which is the highest rate of the three analyzed markets. The majority of the smartphone users (58%) use their phone to go online several times per day, and 88% use their phones to go online at least once a day. The online sessions are often several but short (52%), but 17% are long sessions and 16% are a mix of short and long. This implies that there is a great variety of the session types. The American consumers are in general satisfied (40%) or completely satisfied (30%) with their internet connection when browsing the web. Only 7% express that they have negative experience of the connection quality and speed. (Our Mobile Planet 2012)

France

	Family bundle	Connecting devices	Unlimited voice/text - capped data	Pure unlimited	Prepaid - Use sum	Prepaid - use specified data	Prepaid - Spec. time period	Capped Blocked	Tablet offers	Only email
	Multiple	Unlimited	Prepaid	Others						
Orange			x	x			x	x	x	x
SFR			x			x		x	x	
Bouygues telecom			x		x			x		

Figure 10. Offerings from the three major actors on the French market (Orange 2013; SFR 2013; Bouygues Telecom 2013).



*Our Mobile Planet 2012

France

Current market picture

The three main actors in the French market are: Orange, SFR and Bouygues Telecom. All three are considered to be successful enterprises, both within the French market as well as (for Orange's case) other markets. Even though Orange is an international company, the offerings are tailored for the national market, and will therefore be analyzed as such.

The normal market offerings, provided by all main actors, are subscriptions, blocked subscriptions and pre-paid. The first mentioned are subscriptions with unlimited talk and text, where the amount of data is added and what the customer actually pays for, hence, a clocked cap. An outlier in the market is Orange, which offers an unlimited plan that includes an unlimited amount of data as well. The second trend in the market is the blocked cap, where a maximum limit for data consumption is set to approximately 500MB for all operators, in order for the consumer to have control over their costs. Pre-paid cards are offered by all operators where the consumer has the choice of either locking certain amounts to specific use (e.g text, talk, data) or using the amount differently each month. Pure data plans, aimed towards tablet owners, exist both as subscriptions and occasional use. (Orange 2013; SFR 2013; Bouygues Telecom 2013)

Consumer analysis

The smartphone penetration in France is 38%, which is notably lower than the US market. Of the smartphone users, 48% are online multiple times a day, and 87% are online at least once a day. However, in the French market there is a larger part of the consumers who only goes online once a day (20% compared to 12% in USA). When online, it is most common that the consumer takes several short sessions (44%) followed by one short session (20%). Several long sessions and a mix of short and long sessions represent 16 % each. This means that both the American and the French consumers prefer short sessions, but the Americans go online more frequently. This can be explained by the consumer satisfaction. The French are generally unsatisfied with their web browsing experience (36% being unsatisfied and 19% being completely unsatisfied). Only 17% are satisfied or better with their browsing experience. This can explain why the French choose to be more restrictive with their online browsing than the Americans. (Our Mobile Planet 2012)

Egypt

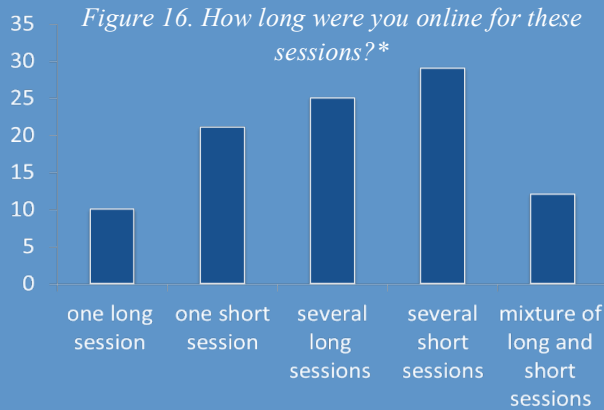
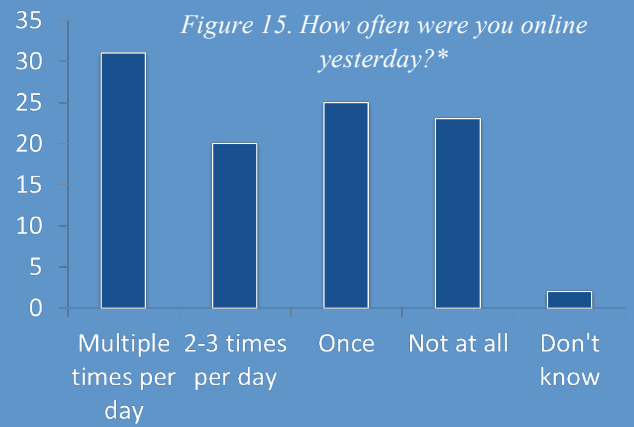
Current market picture

The three main actors on the Egyptian market are: Vodafone, Mobinil and Etisalat. Just as Orange on the French market, Vodafone is active internationally but provides offerings tailored to the national market.

All operators have pre-paid offerings, which often only include voice and sometimes text, and where the customer pays an additional amount for the use of data. Though, offerings where data is included exist. All three operators have offers with a specific amount of data, (for example 120 min, 30 text

	Family bundle	Connecting devices	Unlimited voice/text - capped data	Pure unlimited	Prepaid - Use sum	Prepaid - use specified data	Prepaid - Spec. time period	Capped Blocked	Tablet offers	Only email
	Multiple	Unlimited	Prepaid	Others						
Vodafone		x		x	x	x	x			
Mobinil		x			x				x	
Etisalat		x			x	x	x			

Figure 14 – Offerings from the three major actors on the French market (Vodafone 2013; Mobinil 2013; Etisalat 2013).



*Our Mobile Planet 2012

and 50MB), but Vodafone also have offerings where an amount is purchased and used until it is depleted. What differs Egypt from the other markets is that all operators have offerings for deaf and mute. These offerings focus on video calls and text. Some operators also offer the opportunity to purchase data for a specific and short period of time.

The offerings that are post-paid are of a different character than the other markets'. The offered data quantity is relatively low, ranging from a couple of MB to 4GB, with the exception of Vodafone who offer 11GB. The operators can only offer higher data amounts if you buy a bundle with a USB connection, ADSL internet or Blackberry Service. Mobinil also have an offer which gives the consumers unlimited facebook, but no other data. Vodafone has a service where additional data can be purchased via text messaging. The different codes are clearly stated on their homepage, making it easy for consumers to expand their experience when they can afford it. (Vodafone 2013; Mobinil 2013; Etisalat 2013)

Consumer analysis

Egypt has the lowest smartphone penetration (26%) of the analyzed markets. As on the other markets, the Egyptians mostly go online several times a day (31%), though this number is notably lower than for the other countries. What is special with this market is that 23% haven't been online at all. In all markets, several short sessions is the most common behavior, but in Egypt several long

sessions is a close second (29% vs 25%). This is something that is unique for this market compared to the other two.

Most of the consumers are indifferent of the experience, but only 15% are dissatisfied or worse. With both France and Egypt having low developed infrastructure, but the Egyptians being mostly satisfied and French being unsatisfied, it brings an interesting point of what factors that drive customers satisfaction. (Our Mobile Planet 2012)

Country comparison

Comparison of offerings

The US, France and Egypt represent three different and diverse markets for mobile data. Key findings include that the most developed market (USA) have the most homogenous operators when it comes to offerings and the other two markets have more diverse offerings across operators. In all markets the unlimited offering for voice and text, where data is added for each month, is offered by all operators. This indicates that this kind of offering can be successful irrespectively of specific market characteristics. From a global point of view, the trend of tiered pricing is highly relevant for this finding since the type of subscription plan for data within these offerings is tiered. The amount of money spent on mobile data is the highest within USA and France, while Egypt, in comparison, spend highest part of their income on data each month (see figure 18) (IEMR 1 2011; IEMR 2 2011; Statista 2013).

USA is the only market where multiple device offerings exist. This implies that highly developed countries, from an infrastructural point of view, have a higher demand for connecting devices. In both France and Egypt, blocked subscriptions exist. This is both to the benefit of the customer, who can limit their expenses, and to the operators, who can limit the data roaming.

Comparison of consumer behavior

In order to properly define the current state and differences of the markets, the interaction between the Mobile Growth factors, and consequently the consumer behavior, plays an important role. Three areas are important when comparing the market specific consumer behavior concerning data, namely: the frequency of usage, the nature of usage and the level of data demand from those activities.

"USA is the only market where multiple device offerings exist."

	ARPU/month \$	%GDP*
USA	46,5	1,2%
France	42,7	1,2%
Egypt	4,5	2,0%

Figure 18. money spent on mobile subscriptions (IEMR 1 2011; IEMR 2 2011; Statista 2013).

"The data consumption in France and the USA is similar, while the consumption in Egypt takes a different form."

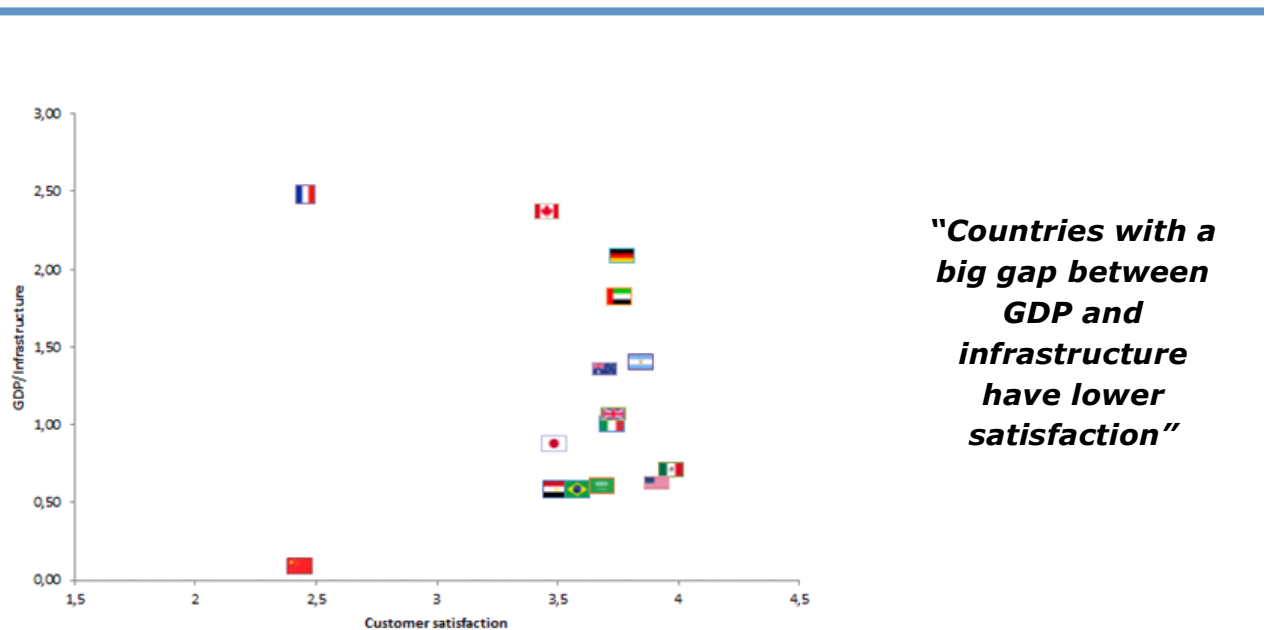
The data consumption in France and the USA is similar, while the consumption in Egypt takes a different form. Americans and French are online for many short sessions that require small amounts of data (accessing social networks, searching the web etc.). In comparison, Egyptians are online for longer, but fewer sessions that are data heavy (watching full episodes of shows, tethers a computer etc.) and use all types of services approximately to the same extent, ranging from 40%-50%. (Our Mobile Planet 2012)

These findings imply that the economic situation of a market, and not infrastructure to the same extent, correlates with the consumer behavior. If two markets have the same economic possibilities, the consumers in these two markets are considered to act in a similar way. This insight is strengthened with the analysis of 33 countries where the same correlation is found. Conclusively, within countries with a higher economic development, the consumers are online for many short sessions that require small amounts of data whilst within countries with a lower economic development, the consumers are online for fewer but longer and more data demanding sessions. (Ibid)

Comparison of consumer satisfaction

To deepen the analysis, customer satisfaction and the level of infrastructure is put in relation to one-another. The level of infrastructure alone is not considered to be enough to analyze the relationship; instead the expected performance of the infrastructure is analyzed. This variable is approximated as the economic situation divided by the level of infrastructure for each country.

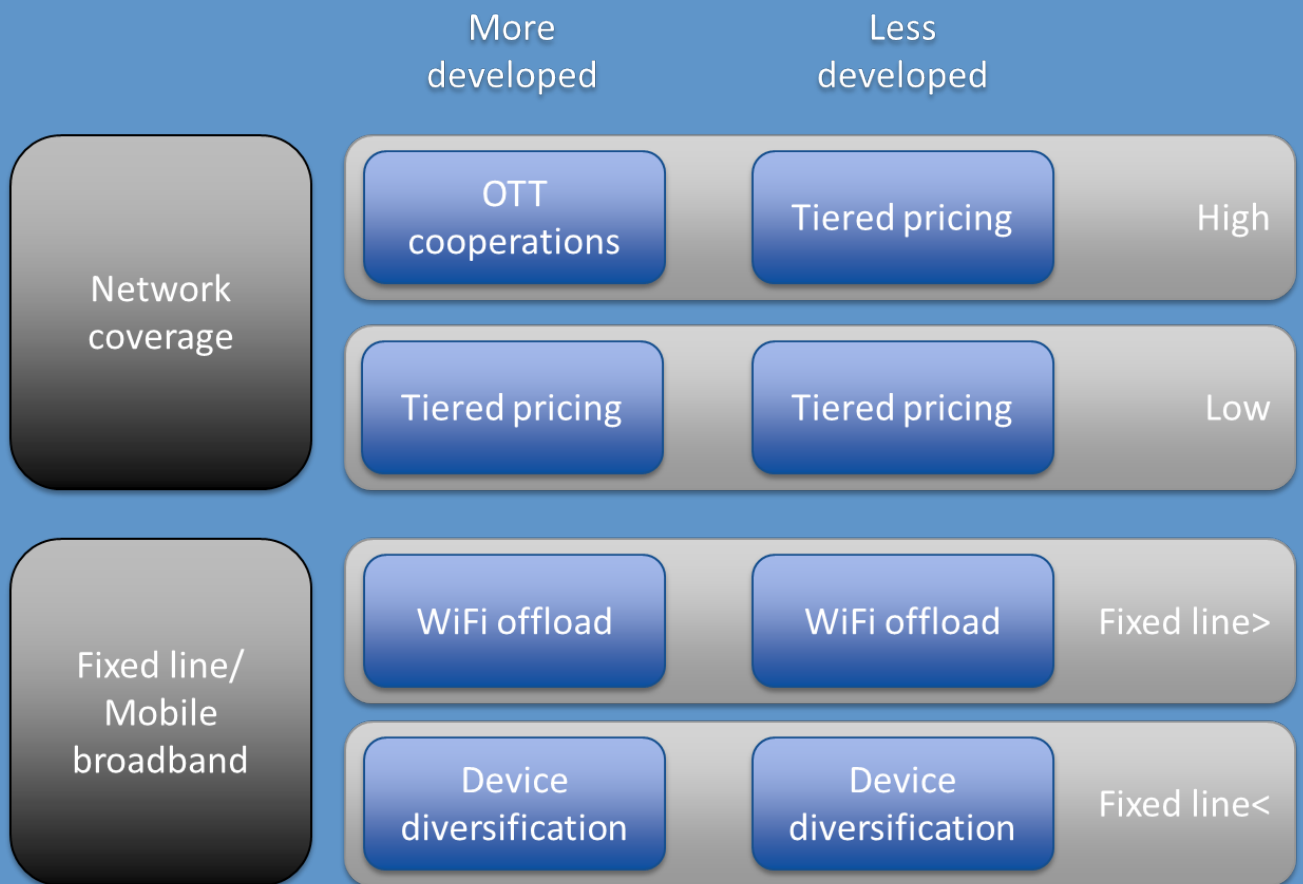
Through this analysis, it is evident that France and China are both outliers with a low level of satisfaction compared to expected infrastructural performance. This implies that countries with a big gap between GDP and infrastructure have a lower satisfaction.



17 **Figure 19.** The correlation between GDP/Infrastructure and customer satisfaction. (Our Mobile Planet 2012; World Bank 2012; MasterCard 2012).

Conceptual framework

- *How the trends are connected to the framework*



Conceptual framework

Introduction

A company's offering and pricing strategies depend on two factors: (1) the market where the company will launch the offering; and (2) the company's strategic positioning and how it competes on the market. By assessing the company's situation in regards to these factors, management can optimize the company's offerings in order to increase and sustain profitability. The framework uses a two-stage approach in order to explore this in relation to the presented global trends.

First Stage: Market Analysis

The market where the offering will be launched is evaluated by means of the six mobile growth factors. As mentioned, the economic situation on the market is highly connected to - and can be seen to influence - the consumer behavior. As a result, the market is initially analyzed from its economic situation in order to grasp the consumers and their behavior. To further develop a market specific offering, the technological Mobile Growth Factors are added, including an analysis of the infrastructural factors (network coverage and the penetration of fixed line, mobile network and mobile phones). This takes into account the specific technological conditions the market, and operators on it, face, making the offering tailored to suit the current and future technologies available.

Status of economic situation

From the previous country specific analysis, several conclusions can be made. Countries with a high GDP and, hence, a well-developed economic situation, are characterized by many short sessions that are less data heavy. Countries with a lower GDP and, hence, a less developed economic situation, are characterized by few long sessions that are data heavier. Given this insight, the design of the offerings on the market should utilize the nature and length of the sessions. On a less developed market, operators should break down the offerings in order to create attractive propositions to consumers with less purchasing power. On these markets, a larger number of offerings will be present and the set of offerings will be more differentiated than on more economically developed markets. Less developed markets that are rapidly changing can look at solutions valid for the more developed markets in order to predict their emerging market.



Figure 20. Illustration of the two stage approach.

To properly design the offering and optimize consumer satisfaction, all Mobile Growth Factors should be taken into account and therefore the infrastructural factors are added to this initial stage of defining the economic situation and analyzing the market.

Status of infrastructure

Breaking the infrastructural index down to its component factors will lead to a clear direction for offering strategies. In the following stage of the framework, the different in consumer behavior will be utilized to form customized offerings.

More economically developed markets

The level of network coverage enables offerings that are dependent on, and improved by, high connectivity. As the consumers use specific applications (Facebook, news sites etc., see appendix Figure 37), offerings can be shaped to provide different levels of speed for the popularity of the applications that are accessed. Applications that are used frequently will, through this, use a prioritized and fast connection, giving the customers a feeling of great quality in their day-to-day use. From an operators perspective, cooperating with providers of OTT services to provide perfect quality on their specific application can provide an extra income.

Even though the consumers use applications that are not data heavy, they expect great quality during all sessions. This insight can be utilized by offering premium data streaming for a limited time or for a special event where the customers require a guarantee of the quality (for example during an important sport event). 49% stated that they would be willing to pay for guaranteed quality during a limited time frame (Vanson Bourne 2013), a number that indicates success for this type of pricing strategy. This is best applied where the **network coverage is high**, since operators do not have to be concerned about the connection and can offer additional services that require more data.

In markets where the **network coverage is low**, it is important to limit the access to data without restricting the user experience. An offering with unlimited text and talk, where the data is added as a tiered plan, meets these requirements. Through this, operators can meet the previously mentioned trend of tiered pricing, which is profitable in this type of market.

49%

are willing to pay for a temporary bandwidth increase.

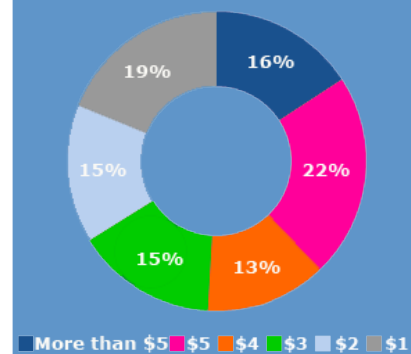


Figure 21. How much would you pay for a temporary bandwidth boost? (Vanson Bourne 2013).

The relationship between fixed line penetration and the penetration of mobile network is a relevant distinction to make. If the mobile broadband penetration is low, the overall willingness to pay for data is considered to be lower since the network access is limited. From the presented research it is shown how the attractiveness of mobile broadband increases as the fixed line penetration is low (Egypt). These two factors are therefore analyzed together.

In markets where the penetration of **fixed line is higher than the mobile network**, offerings should be developed where hotspot access is an additional feature and by that an additional source of income. This can offload traffic from mobile broadband to fixed lines and is a cost efficient alternative to expensive investments in extended mobile networks. These hotspots should preferably be a cooperative effort from many operators to provide the customers with the best connection. If hotspots are accessible only for a single operator, customers would have to either search for the closest hotspot available for their operator, which might be far away, or consume data through their 3G/4G connection.

In markets where the penetration of **fixed line is lower than the mobile network**, multiple device data subscriptions should be offered. Customers can by this be tied to one operator for all consumption of data, no matter what device is used. This can be expanded by charging for tethering between devices for those customers that does not have a multiple device subscription. It is important to note that the difference between fixed line and mobile network penetration may not always be significant. In these markets, the solutions for both cases are applicable, and both hotspots as a way of offloading the mobile network and multiple device subscriptions can be offered.

Analyzing the penetration of mobile phones is rather straightforward. If the penetration is really low, the potential to make money as an operator, with a specific focus on mobile phones, is limited. Markets with **high mobile phone penetration** should focus on bundle offerings, commonly advertised as "family offerings", and plans focused on the number of connectable devices.

Less economically developed markets

On a less economically developed market, operators need to break down their offerings in order to create attractive propositions to

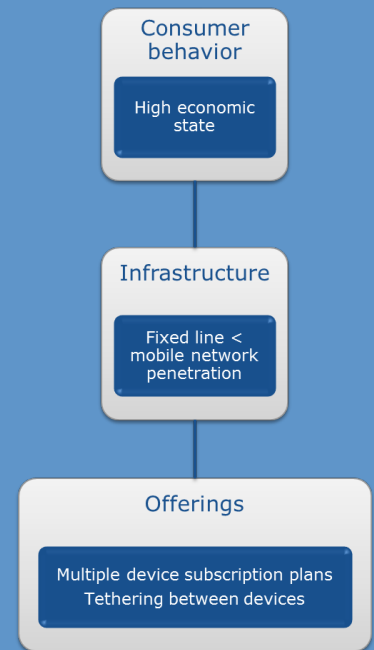


Figure 22. Framework illustration.

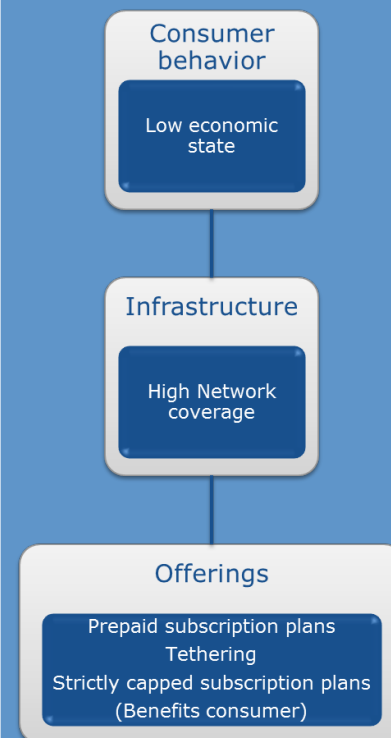


Figure 23. Framework illustration.

consumers with less purchasing power. The consumers in these markets use their devices in many different sessions and tend to use data demanding applications to a larger extent than more developed countries. On these markets, a larger number of offers should be present and the set of offers should be more differentiated than on markets with a better economical state to fit the consumer behavior. Here, it is not necessary to single out certain applications for prioritized connection as was the case for the more developed countries.

Where the **network coverage is high**, pre-paid offerings can be used as a guarantee of payment. These subscriptions should, as previously stated, be designed to attract the various types of consumers on the market through a tethered offering design. Another offering is the blocked subscription. By getting consumers to sign up for a restricted amount of data, where higher data consumption per month would be blocked, they can keep track of their economy and not risk to receive a high bill at the end of the month. Blocking data after the subscribed amount is therefore to the benefit and protection of the consumers in a market with high network coverage.

The same approach, with a blocked subscription, should be offered in markets where the **network coverage is low**. This is not only to the benefit of the consumer anymore, but also for the operator since the data consumption can be restricted.

The current penetration of fixed lines influences the future development of the market. Markets where the penetration for **fixed lines is higher than the mobile network** will rely on the fixed lines for data consumption, resulting in room for expanding the wireless network. The costly and time consuming expansion of a mobile network is dependent on cooperative investments from operators. An attractive alternative to expansion of the mobile network is to focus on providing customers with access to hotspots. This type of offer utilizes the established fixed lines and provides customers with temporary access.

Markets where the penetration of **fixed lines is lower than mobile network** should offer the possibility of tethering. This provides customers with the option of sharing the mobile network access to multiple devices. Another option is to offer ADSL in combination with data plans, in order to provide consumers with the opportunity to have Wi-Fi in their homes.

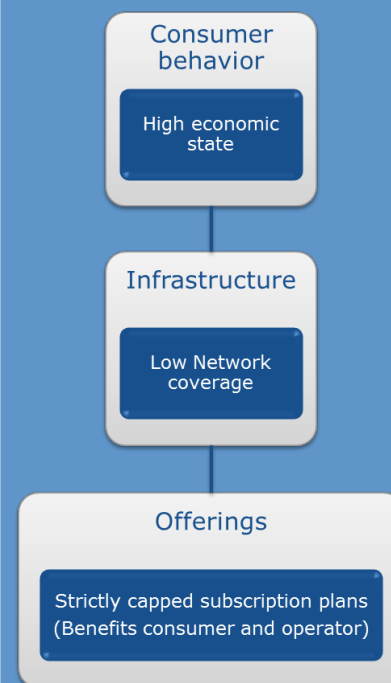


Figure 25. Framework illustration.

The penetration of mobile phones is of great importance when considering entering a less developed market. If the **penetration of mobile phones is low**, the decision of entering the market should be revised.

Framework connected to trends

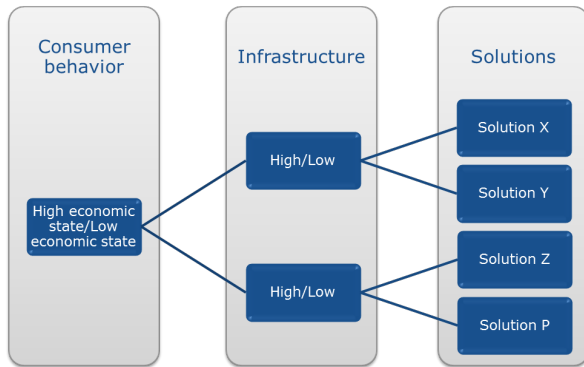
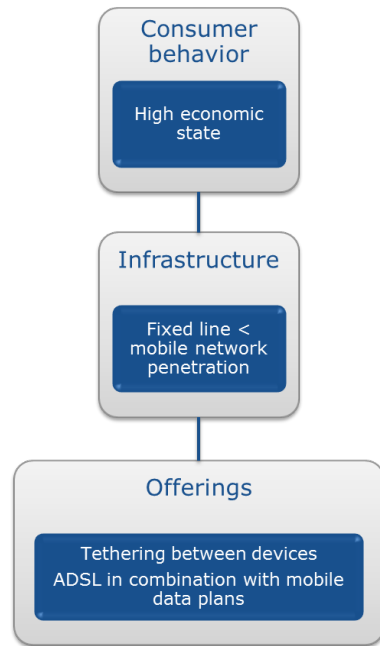


Figure 27. Illustration of the train of thought of using the framework, For complete framework see appendix.



All presented solutions are tied to the previously mentioned global trends. In more economically developed markets, characterized with high network coverage, cooperation with OTT service providers is relevant. Tiered pricing is the most significant trend in markets with a low economic development and high network coverage. In markets with low network coverage, Tiered pricing should be applied irrespectively of the economic state.

When the fixed line penetration is higher than the penetration of mobile network, Wi-Fi offloading should be applied. Bundled offerings, with device diversification, should be applied to markets where the fixed line penetration is lower than the mobile network penetration.

Independent of the markets' infrastructural state, operators should avoid unlimited plans for data consumption and offer tiered plans in the future. Since consumers do not use less mobile data when subscribing to a tiered plan compared to an unlimited, the consumer experience will not decrease. This type of controlling the mobile data usage is also sustainable from a profitability perspective.

Second Stage: Strategic Positioning

After analyzing the intended market, management has to ensure that the offerings are pertinent to their company strategy. By assessing the companies' strategy and business model, management can optimize the companies' offerings. The framework uses Casadesus-Masanell & Ricart's three-stage approach (2010) when exploring this subject.

The company's strategy (1) accommodates the choice of business model and thus how the company is intended to compete. The business model (2), in turn, contains the company's philosophy and way of reasoning, which is directly, connected how it creates value for its stakeholders. Based on the business model, a determined set of choices are open to the company, which represents their tactics (3). Looking into the company's strategy and business model thus provides management with the residual choices open to them, the company's tactics.

To maintain the company's strategic position, potential offerings have to lie within their tactics, since anything else would cause disharmony and impair the company's positioning. For example, a low cost operator would face difficulties trying to implement offerings that require a higher cost structure, and are by that not relevant. Similarly, a business oriented operator should design their offerings to suit that clientele, providing segment specific advantages for data consumption.

"To maintain the companies strategic position, potential offerings have to lie within their tactics, since anything else would cause disharmony and impair the company's positioning."

Managerial Implications

The usefulness of the framework can be seen in the light of the development within the mobile network industry. Mobile network operators are facing a growing challenge to profit from mobile data. This is due to many factors, such as: increasing costs associated with running the networks, more intense rivalry among competitors, consumers expecting unlimited data offerings and consumers and OTT service providers expecting faster and more reliable connections.

The framework enables mobile network operators to identify offerings attractive to consumers and relevant in relation to the market's infrastructural state. Aligned with the company's strategic positioning, this maps offerings which cope with the mobile data challenges and enables operators to profit from mobile data. However, the implementation of the recommended offerings is situational.

The implementation of additional offerings, such as family and multi device plans, usually do not require as much consideration and planning as more strategic solutions, such as conversion from unlimited to tiered data plans. These strategic solutions are connected to the level of infrastructure within a market and will be more successfully implemented when there is a shift in the infrastructure, for instance when a new mobile communication technology standard, such as 4G, is launched. The conducted analysis has shown that when 4G is launched, mobile network operators have a good opportunity to convert their unlimited mobile data plans to tiered ones, since consumers' expectations and behavior are more easily reshaped.

"To maintain the company's strategic position, potential offerings have to lie within their tactics, since anything else would cause disharmony and impair the company's positioning."

Conclusion

The analysis of all three diverse markets (the American, the French and the Egyptian) has served as the basis for the framework which constitutes the core of the report. It also indicates how the framework can be used on markets that differ significantly in terms of their economic situation and their level of infrastructure.

The conceptual framework, which can be applied to any properly analyzed market, provides insights associated with the offering of the company. It is based on the given markets' level of economic development and level of infrastructure. The proposed solutions are tied to the global trends: the rise of OTT services, tiered pricing and traffic offload. This approach takes the future development of the market into consideration.

In more economically developed markets, characterized with high network coverage, cooperation with OTT service providers is relevant. Tiered pricing is the most significant trend in markets with a low economic development and high network coverage. In markets with low network coverage, Tiered pricing should be applied irrespectively of the economic state.

When the fixed line penetration is higher than the penetration of mobile network, Wi-Fi offloading should be applied. Bundled offerings, with device diversification, should be applied to markets where the fixed line penetration is lower than the mobile network penetration.

The solutions described above indicate that the presented conceptual framework can prove to be very useful for companies interested in launching new offerings associated with mobile data or improving the already existing subscriptions and data plans. By adopting these solutions, MNOs can increase profitability from mobile data consumption without compromising the consumer satisfaction.

"By adopting these solutions, MNOs can increase profitability from mobile data consumption without compromising the consumer satisfaction"

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Appendix

Trends

Tiered pricing

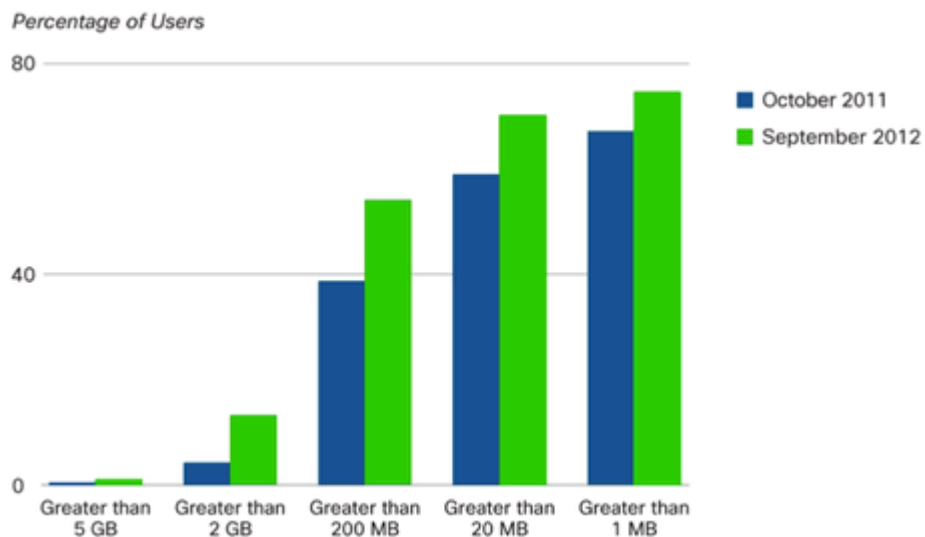


Figure 28. 1 Percent of users consume 5 GB per month and 13 percent consume over 2 GB per month (Cisco 2013).

Mobile Network Connections Speeds to Increase 7-fold and the Increasing Impact of 4G

The average global mobile connection speed in 2012 was 526 kbps, and according to Cisco's forecast (2013) it will exceed 3.9Mbps in 2017, which amounts to the growth at a CAGR of 49 percent. The smartphone speeds (generally 3G and higher) are currently almost four times higher than the overall average.

Although there is anecdotal evidence that the usage of mobile networks increases when their speed increases, there is often a delay between the increase in speed and increase in usage. Various trends can affect the process in various countries, such as the high growth rates for developing countries and regions relative to more developed areas.

	2012	2013	2014	2015	2016	2017	CAGR 2012-2017
Global							
Global speed: All Handsets	526	817	1,233	1,857	2,725	3,898	49%
Global speed: Smartphones	2,064	2,664	3,358	4,263	5,284	6,528	26%
Global speed: Tablets	3,683	4,811	6,082	7,624	9,438	11,660	26%
By Region							
Middle East & Africa	219	371	640	1,101	1,837	2,898	68%
Central & Eastern Europe	551	909	1,458	2,288	3,426	4,760	54%
Latin America	200	349	586	956	1,492	2,207	62%
Western Europe	1,492	2,233	3,124	4,168	5,429	7,013	36%
Asia-Pacific	316	506	806	1,318	2,039	3,036	57%
North America	2,622	4,083	5,850	8,023	10,793	14,399	41%

Figure 29 Projected average mobile network connection speeds (in kbps) by region and country (Cisco 2013).

Another factor that should be mentioned is associated with the development of 4G networks: their impact is significant, because 4G connections, which include mobile WiMAX and Long-Term Evolution (LTE), generate a disproportionate amount of mobile data traffic. Additionally, many Services Providers around the world are already busy rolling out the 4G networks in order to help with meeting the growing end-user demands for more bandwidth, higher security and connectivity on the move (Fig 7). Although nowadays 3G capable devices and connections will gain the highest share (50 percent of all devices and connections), the global mobile 4G connections will grow from 60 million in 2012 to 992 million in 2017 (Cisco 2013).

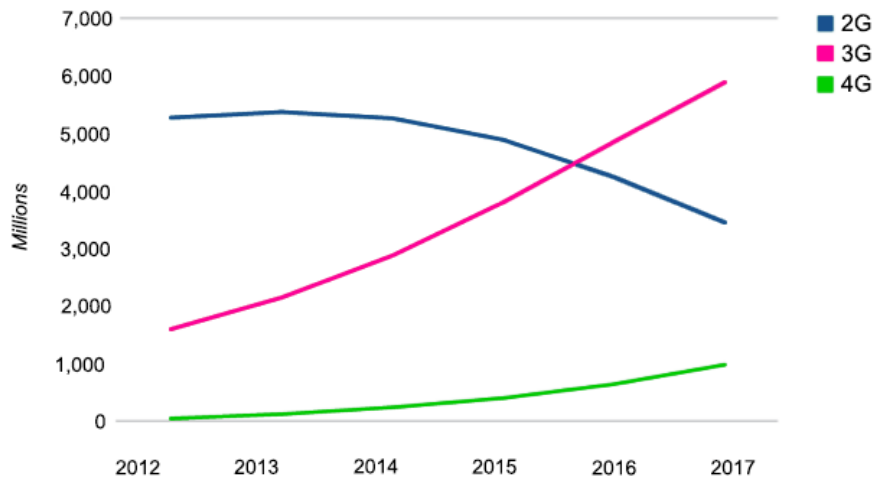


Figure 30. Global mobile devices and connections by 2G, 3G and 4G (Cisco 2013).

The adoption of 4G technologies is expected to increase as well. Although nowadays 4G connections represent only 0.9 percent of mobile connections today, they already account for 14

percent of mobile data traffic. In 2017, these numbers will grow significantly: 4G will represent 10 percent of connections, but 45 percent of total traffic (Cisco 2013).

A significant change in the industry can also serve as good timing for stakeholders to alter their business model tactics (Eggers et al. 2007). Therefore, the launch of 4G can provide an opportunity for MNOs to try new types of offerings, as the consumer consensus will be more easily altered (Thorngren 2013).

Personal Cloud

Online, cloud-based data storage will gradually replace the off-line modes of data storage (APM Digest 2013). The personal cloud shifts the focus from the client device to cloud-based services delivered across devices. This puts a growing pressure on MNOs as the relationship between increased personal cloud usage and mobile data usage may be considered as proportional. According to Cisco’s predictions (2013), cloud applications will globally account for 84 percent of total mobile data traffic in 2017, compared to 74 percent at the end of 2012, as shown in Fig 8. Mobile cloud traffic will grow 14-fold from 2012 to 2017, a CAGR of 70 percent.

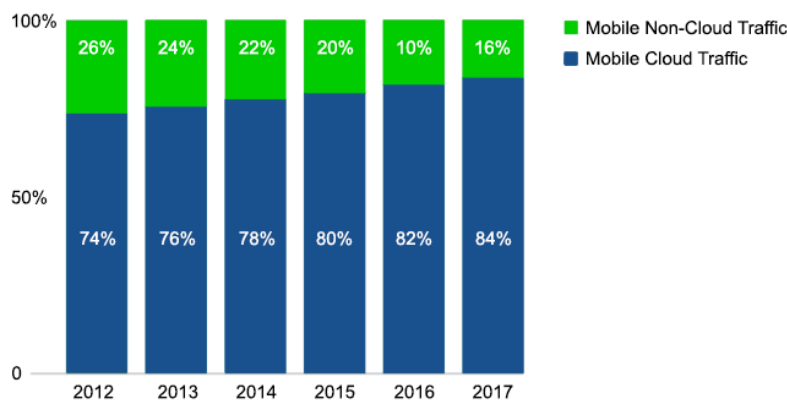


Figure 31. 84 percent of total mobile data traffic will be cloud based by 2017 (Cisco 2013).

Device Diversification

Although laptops nowadays generate disproportionate amount of traffic, other types of devices - such as smartphones, tablets and machine-to-machine (M2M) nodes - will begin to account for more significant part of the traffic by year 2017. The increasing number of wireless devices that are accessing mobile networks will account for the most prominent increases in traffic growth. (Cisco 2013)

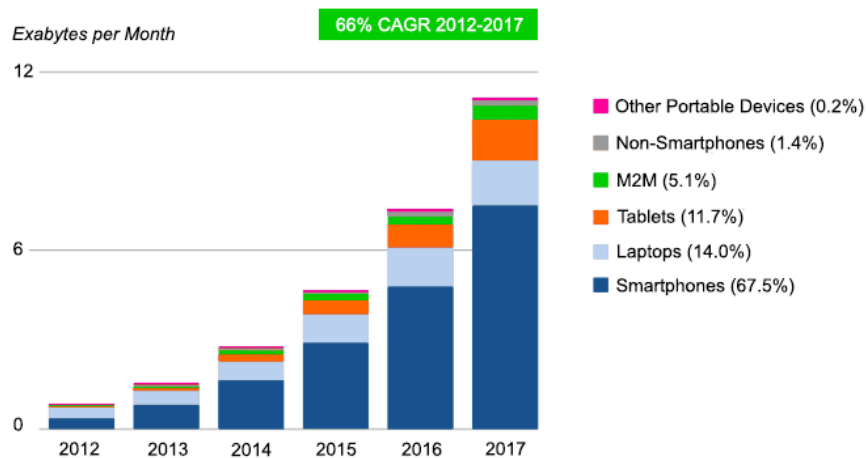


Figure 32. Smartphones lead traffic growth (Cisco 2013).

According to Ericsson Consumerlab (2012), the majority of tablet, smartphone and mobile phone users in USA, Sweden, Japan, and Australia prefer to use all their devices for their online services instead of using a specific device for each online service. What is more, globally the purchase intent for tablets is now greater than for desktop PCs, and the purchase intent for smartphones is now greater than for laptops.

Big Data

Storing and analyzing massive amounts of consumer data will become big business. Companies already capture trillions of bytes containing information about their customers, suppliers and operations. (Brown et al. 2011)

The Internet of Things (IoT)

Cellular communication between objects, machines or sensors has led to growth of M2M connections (Figure 10). These connections can be found both at home or in professional environments in different automated products, such as smart metering and utilities, maintenance, building automation, automotive and consumer electronics etc. Important to notice is that M2M is increasingly migrating from 2G to put further pressure on 3G and 4G technologies (Figure 11). (APM Digest 2013; Cisco 2013)

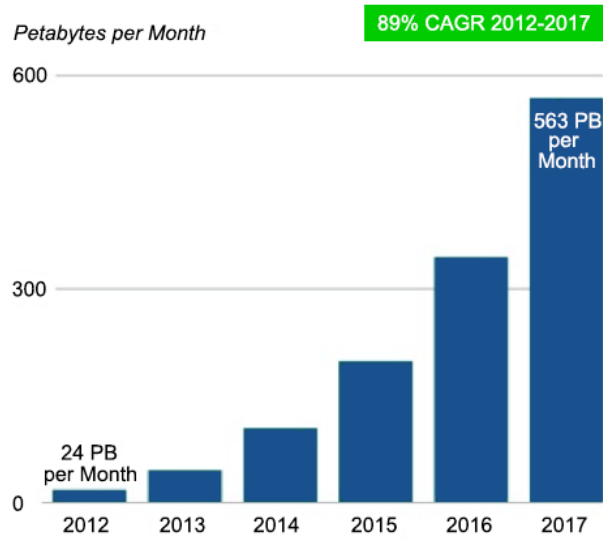


Figure 33. M2M traffic forecast until 2017 (Cisco 2013).

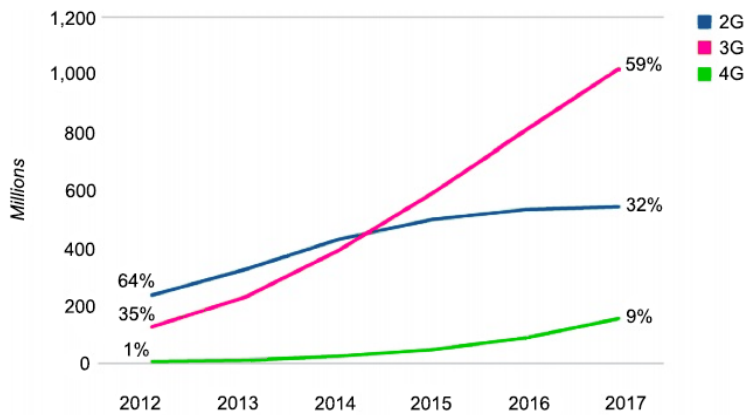


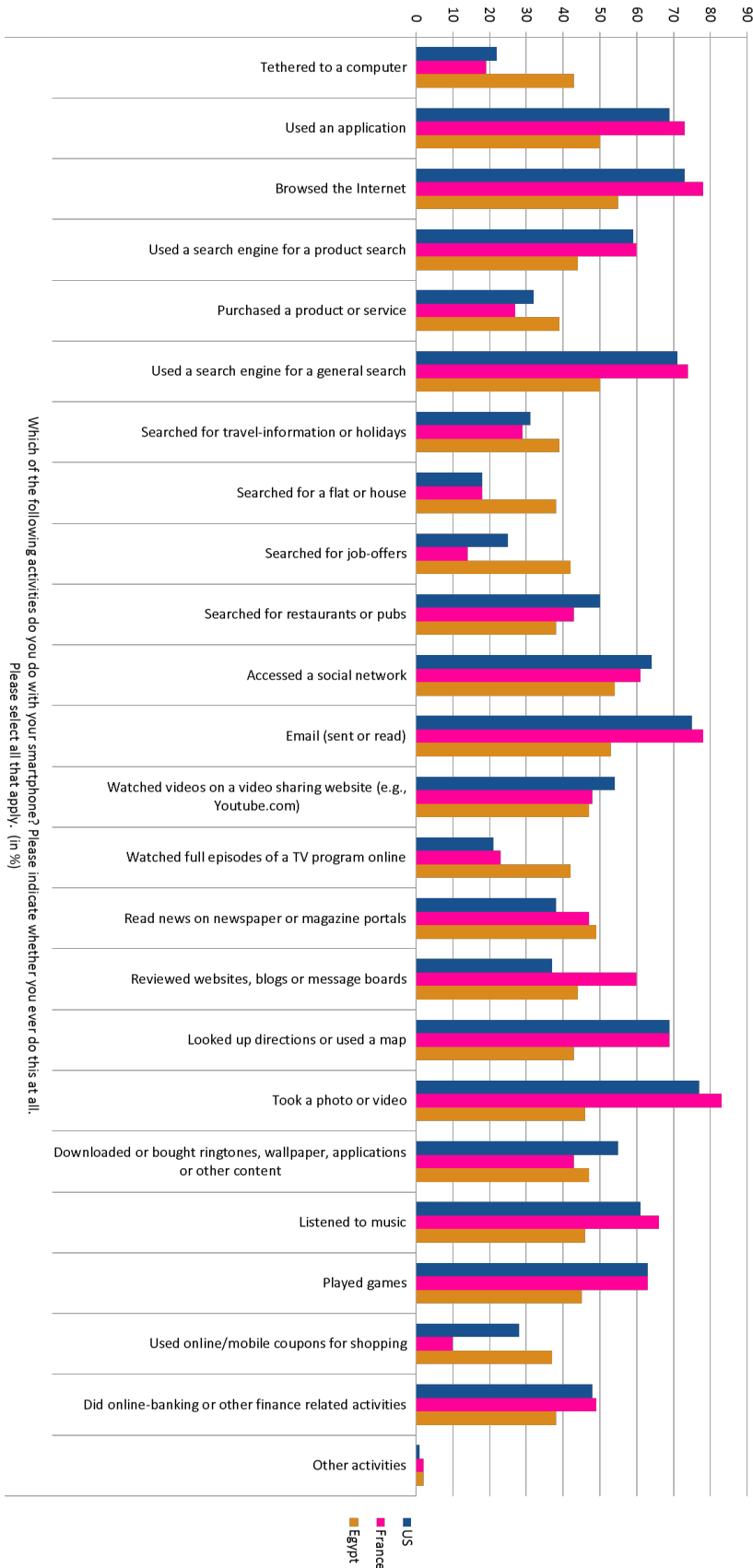
Figure 34. M2M: migrating from 2G to 3G and 4G (Cisco 2013).

Consumer behavior

Figure 35. Where people use their smartphones (mobileplanet 2012)

	On the go (e.g. while commuting, walking)										
	Home	Work	In a store	Restaurant	Café or coffee shop	Doctor's office	Airport	At a social gathering/function	Public transport	School	Somewhere else
US	97	71	83	71	50	56	49	60	36	30	3
UK	97	72	85	59	61	28	44	52	61	16	5
UAE	94	82	74	68	67	41	75	52	53	24	3
SWITZERLAND	98	81	83	72	69	35	58	51	73	31	3
Sweden	97	80	87	61	59	29	53	50	69	30	4
Taiwan	96	84	70	74	63	50	42	40	70	40	1
Spain	91	61	68	56	62	36	42	36	54	25	3
Saudi Arabia	86	66	65	57	54	43	49	41	48	41	9
Norway	94	75	81	55	60	46	67	52	69	37	5
New Zealand	97	76	80	56	64	35	55	56	44	24	4
Netherlands	96	76	84	57	55	34	44	47	58	32	5
MEXICO	89	75	64	67	63	38	43	50	49	44	5
Japan	99	66	86	62	60	32	30	44	59	18	1
Italy	94	67	81	47	50	27	42	32	51	20	3
Ireland	95	70	78	60	64	41	59	54	61	26	5
Germany	97	72	88	58	58	44	43	45	69	26	4
France	98	79	76	65	62	45	44	42	63	26	3
Finland	95	66	77	46	50	21	42	50	60	25	4
Egypt	80	65	59	46	49	46	44	43	51	37	5
Denmark	98	79	86	59	59	54	59	63	70	40	3
China	94	87	87	75	61	50	52	61	83	40	1
Canada	97	77	83	72	67	50	56	58	51	28	3
BRAZIL	96	82	64	69	56	53	49	52	60	49	7
Belgium	96	69	70	52	54	31	39	37	47	26	3
Austria	98	84	91	70	68	51	53	48	77	30	4
Australia	98	73	85	61	63	48	61	61	61	27	4
ARGENTINA	89	74	71	62	60	48	38	49	64	34	7

Figure 36. Consumption of mobile data (mobileplanet 2012).



Framework

Figure 37. The framework including solutions

