



MOBILE BUSINESS TRENDS

ERICSSON MOBILITY REPORT APPENDIX

NOVEMBER 2015



7.3
BILLION
Mobile subscriptions globally in Q3 2015



3.4
BILLION
Mobile broadband subscriptions in Q3 2015



850
MILLION
LTE subscriptions in Q3 2015



350
MILLION
Smartphones sold in Q3 2015



65%
Growth in data traffic between Q3 2014 and Q3 2015

MOBILE BUSINESS TRENDS

For several years, Ericsson has published the Ericsson Mobility Report. It is a leading industry publication with analysis of the mobile market and traffic trends, based on Ericsson forecasts and in-depth traffic measurements from a large selection of live networks around the globe. Over the years we have followed the tremendous growth in population coverage, subscriptions and data traffic.

In this Mobile Business Trends appendix we offer an overview of the mobility business in terms of global and regional service revenue.

We share our observations of the different ways operators take mobile broadband-based offerings to the market and benefit from the increased usage of mobile data. We categorize these observations and identify trends underpinning each category.

Finally, a special topic concerning a roaming business in transition is included.

The intention of this report is to provide an overview of what is happening in the market, and discuss ways that operators are monetizing on the ever evolving demand for mobile services.

We hope you find this report an engaging and valuable complement to the main Ericsson Mobility Report.

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THE MOBILITY BUSINESS



Between 2010 and 2014 operators' mobile service revenue grew at an annual average rate of

2.7%

In 2014 alone, total mobile service revenue growth was only

1.7%

On the other hand, service revenues coming from mobile data grew at a CAGR of

34%

between 2010 and 2014

Data now accounts for over 40 percent of service revenues globally



- Global
- Asia Pacific
- North America
- Western Europe
- Latin America
- Middle East and Africa
- Central and Eastern Europe

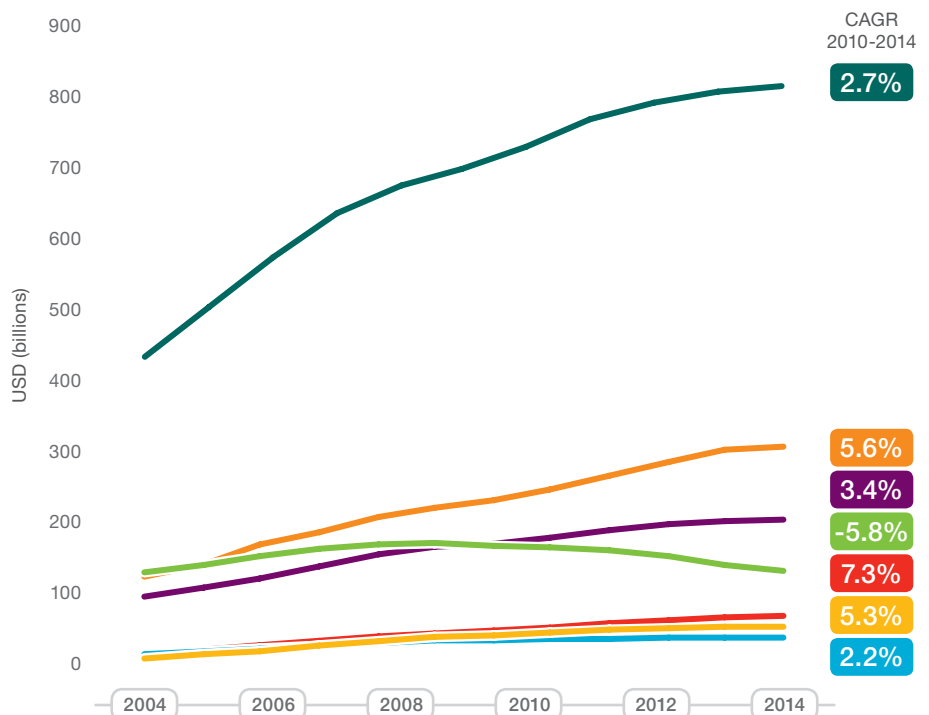
For the last decade, telecommunications has been undergoing a major transformation which has accelerated during the last few years. A broad range of mobile content, services and devices have been driving consumer behavior and mobile data usage. Taking part in this rapidly evolving industry, operators are looking for ways to align their business with the demand in order to achieve sustainable growth.

Revenue growth flattening out

A key challenge faced by mobile operators today is to turn the growing usage of mobile data services into greater revenues. The growth of mobile service revenue has dropped below 2 percent, compared to 10–15 percent growth a decade ago. The graph below shows how total mobile service revenue growth has

flattened out. This is despite high growth in both subscriptions and mobile data traffic. In 2014, overall mobile service revenue growth reached a modest 1.7 percent. Apart from macro-economic influences, this slowdown is mainly due to increased price competition and a decline in traditional voice revenue. In addition, operators have struggled to take a position in the emerging content industry which is currently dominated by other players. On the other hand, the increasing adoption of new services also drives an increased consumption of mobile data. The growth of mobile data revenue alone, with a Compound Annual Growth Rate (CAGR) of 34 percent between 2010 and 2014, shows that underlying growth potential is strong.

Wireless service revenue trends based on data from Strategy Analytics covering 247 active wireless operators



Note: Ericsson analysis based on data from Strategy Analytics, covering 247 active wireless operators which collectively account for 80 percent of the world's cellular subscriptions. Analysis based on data from June 2015 using fixed exchange rates.

Revenue growth varies between regions

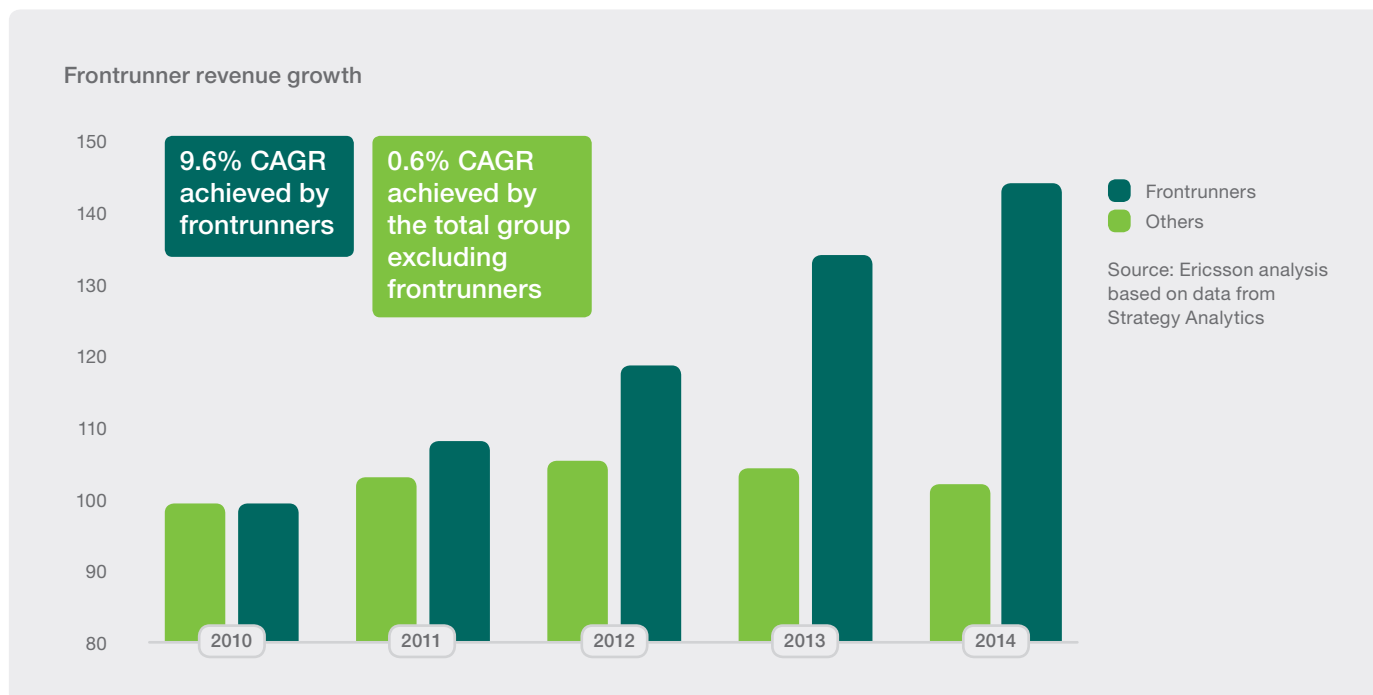
Asia Pacific, Latin America, and the Middle East and Africa have shown relatively strong revenue growth, at a CAGR between 5 and 8 percent between 2010 and 2014. This is mainly due to significant subscription growth.

In North America, growth can be attributed to fast adoption of smartphones, tablets and laptops, and high mobile data usage. Operators have been successful in leveraging LTE for differentiating services in order to drive value and usage, without necessarily charging a premium for the higher speed.

On the other hand, Western Europe shows a decline in service revenue. Despite relatively high data usage, operators in Western Europe have found driving value from their data services challenging. The decline can mostly be attributed to price erosion.

Successful operators drive revenue growth from mobile data

As seen on page four, global operator revenue grew at an average rate of 2.7 percent between 2010 and 2014. However there are operators that achieved significantly higher growth rates. We have identified 20 operators that are industry leaders, which we have named Frontrunners.¹ As a group, these operators showed an average annual revenue growth of 9.6 percent over the same time period. They have been able to turn the increasing demand for mobile data services into profitable revenue growth. The rest of the operators showed a growth of only 0.6 percent over the same period.



¹ Operators with annual revenue growth of 5 percent or higher, non-voice revenue of above 25 percent and positive EBITDA. Source: Ericsson report 'Growth Codes, Extended strategies edition'

MONETIZING MOBILE SERVICES

Operators are growing their mobile business in a number of ways, by both capitalizing on the rapid uptake of mobile data, and exploring ways to improve their share in the ICT value chain

To better understand how operators build and take their offerings to the market we have observed and analyzed publically available information from operators around the world. Presented here are a wide range of examples, showing a variety of initiatives taken by operators in the marketplace.

The findings are structured into four categories that reflect the time and complexity aspects of implementing a business proposition.

Each category includes two trends that illustrate different actions that operators take to grow their revenues in both the short and long term.

The Enablement and Extension categories are predominantly about improving current business and building a platform for further growth. The Expansion and Exploration categories are more about operators broadening their focus to open new markets and evolve their position in the ICT value chain. This normally requires more time for implementation and may involve building new assets and capabilities or enhancing existing ones.

The way the material has been categorized is illustrated here. In the following pages a number of examples are provided according to this structure.



ENABLEMENT

Operators are taking fundamental actions to accommodate the shift to a data-centric world. Through promotion of smartphones and a portfolio of subscriptions which allow users to gradually evolve their usage, operators motivate their customers to become mobile data users and thereby enable further growth.

TREND 3

Increasing data usage



TREND 4

Connecting more devices

EXTENSION

Operators are continuously striving to extend their mobile data revenues. By encouraging customers to increase their mobile data usage, connect multiple smart devices and adopt higher data speeds for better experiences, operators motivate customers to evolve their usage and pay for the data consumed

EXPANSION

Many operators are expanding their business beyond their core services. By embracing demand for digital services, operators use content and apps as a means to differentiate themselves from the competition and to increase revenues. Operators are also addressing new use cases and revenue opportunities by targeting their offerings to specific service areas.

TREND 5

Monetizing content, apps and services



TREND 6

Targeting adjacent industries

TREND 7

Two-sided business models



TREND 8

Opening up network capabilities

EXPLORATION

Several operators are exploring new sources of revenues through innovative two-sided business models or through new applications of current network assets. The evolving ICT industry comes with new use cases, new value chains and new ways for operators to capitalize on their network capabilities, which all provide opportunities for revenues from outside their traditional customer base.

MIGRATION TO SMARTPHONES

The basis for driving mobile data revenue is to enable more customers to become mobile data users. Smartphone ownership usually results in higher ARPU so operators are using a variety of methods to drive the uptake of smartphones. Even though smartphones make up the majority of phones sold today, there is still potential for further uptake

Subsidies, trade-in offers and own brands

For more than a decade operators have subsidized the purchase of mobile phones as a way to drive growth. There is a trend to move away from subsidizing, but in many markets it is still common. In Asia Pacific, the Middle East and Africa, there has been rapid growth in smartphone subscriptions with customers exchanging their basic phones for smartphones. This is mainly due to increasing availability of low-cost smartphones.

Many operators in these regions are also offering favorable trade-in deals from basic 2G phones to 3G

smartphones. For example, one operator in South East Asia offered their prepaid customers USD 70 worth of voice calls and 350 MB of data over 7 months when trading in a basic phone to a 3G smartphone, providing the account was actively used.

In one market in Central and Eastern Europe, two leading operators actively promoted smartphone adoption with their own branded devices in attractive offers. For example, one of the operators offered a 3G smartphone for USD 25, coupled with a 2 month prepaid subscription.

Device upgrade programs

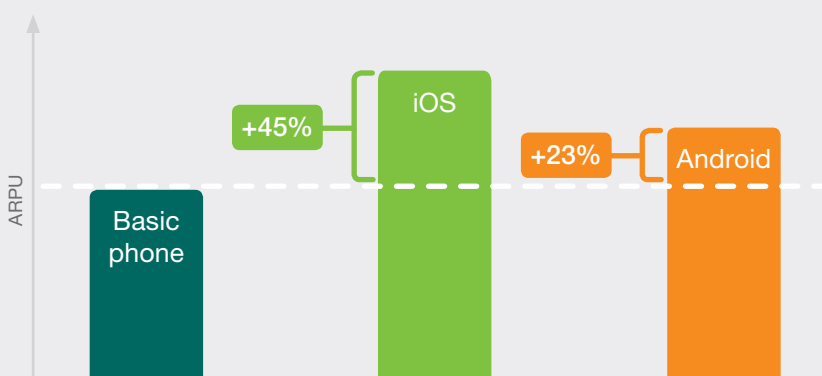
Several operators in developed markets are starting to offer device upgrade programs and leasing options. These are aimed at customers that want the latest smartphone, but wish to avoid the high upfront costs of either paying the full retail price for the phone, or being locked in to a timed service contract with a subsidized phone. For example, one operator in North America has introduced a leasing program where the customer can trade in for a new model up to three times in one year.

Upgrade programs mean the operator or a third party finances the device, and the customer pays it off over the duration of the program. There is usually an option to upgrade early by paying the remaining balance of the current device, without an early termination fee. Device upgrade plans and leasing plans are decoupled from the service plan, giving more flexibility to the customer.

Selling devices online

In developing markets such as India, Africa and China, operators often partner with online retailers to make their offerings more accessible and attractive. For example, in Sub-Saharan Africa, when buying a smartphone from a well-known online retailer, the customer gets 1 GB free data, 1 month of unlimited music streaming and 6 months double data with every top up. This is based on a partnership between the operator and the online retailer.

Smartphones improved ARPU for operator in Central Eastern Europe
(Measured three months after customer purchase of smartphone)



Source: Vedomosti (July, 2014)

Note: Blended ARPU is higher for iOS than Android because iOS is only available for one high-end model, while Android is available for a range of models, both low-end and high-end

DATA-CENTRIC SUBSCRIPTIONS

Along with smartphone adoption, different types of data packages have emerged. Operators are enabling uptake of data services with pay-as-you-grow structures, the possibility to share data, and targeted app bundles. The range of alternatives provides users with access to data according to their needs and lifestyle

Tiered data plans

Tiered data plans are the most common tariff model, and in developed markets they typically include unlimited or large buckets of voice and text messages. Tiered data plans allow users to begin with small data packages and move to bigger packages as usage increases. There are different ways operators manage bucket sizes:



Throttling to low speed when the bucket is consumed



Hard stops, where data connectivity is blocked when the limit is reached



Overage charge above bucket limit

Moving away from throttling in favor of hard stops can improve customer experience. For example, one leading operator in Latin America removed throttling and as a result the quality index designed by the regulator in the country improved by 29 percent.¹ A similar effect was seen in Sweden when hard stops were introduced, which led to a reduction in the number of calls to customer care about a 'poorly functioning service'.

Defining the size of the data buckets is a balancing act between price and volume. In markets where data packages are still predominantly small, data usage has still not taken off. On the other hand, in a few markets where unlimited flat rate or extremely large packages are dominating, operators seem to have a hard time monetizing traffic growth over time. Most operators are moving away from unlimited data plans. For example, in North America several operators have stopped offering unlimited plans to new customers. For customers that already have unlimited plans, operators are suppressing heavy load by applying throttling in congested areas.

Data share plans

Data share plans are a growing phenomenon, connecting several devices and/or users to a single account. An example model is a monthly fee plan based on data usage, with additional charges for each user and/or device added to the plan. Unlimited or large buckets of voice and messaging are usually included. Data share plans allow operators to access a larger share of a family's budget because usage often increases, as does customer loyalty. There are variations across regions. In the second half of 2014, 26 percent of users in the US were on data share plans, compared to 5 percent in India and Brazil.²

★★★

29%

One operator experienced 29 percent improvement in quality index when removing throttling

Social networking offerings

Social networking offerings prosper in many developing markets. Most of these offerings provide unlimited access to apps such as Facebook, Twitter and WhatsApp, as well as local apps. Typically these packages are sold as hour, day or week passes at very low prices. This can be a way to lower entry barriers to mobile data services, whilst giving operators the opportunity to upsell services later on. For example one operator in the Sub-Saharan African region offered a package with unlimited access to social networking apps, 60 minutes of voice, 500 SMS and 300 MB data for USD 1 per day.

One specific implementation of social networking offerings is Facebook's Internet.org initiative. Here, operators can work with nonprofit organizations to provide new services to the two-thirds of the world population that doesn't have access to the internet. For example users can get free access to different government services. Being online also enables them to discover other services they would not have found otherwise and that they would be willing to pay for.

¹ Operator annual report, Latin America

² Ericsson ConsumerLab, Embracing data sharing (January, 2015)

INCREASING DATA USAGE

For customers with smartphones and data-centric subscriptions, many operators extend their business by encouraging increased usage and demand for higher speeds. Easy top-ups, campaigns to introduce higher speeds and a conscious device portfolio strategy are all different methods operators use to increase mobile data usage

Easy account top-ups

Operators offer a variety of top-up services and pricing structures for when customers reach their data limit. One Middle Eastern operator charges the same price for all top-ups, but the size of the top-up depends on the original plan. By providing transparency of prices as well as control, operators bolster a feeling of comfort among their customers which in turn encourages usage.

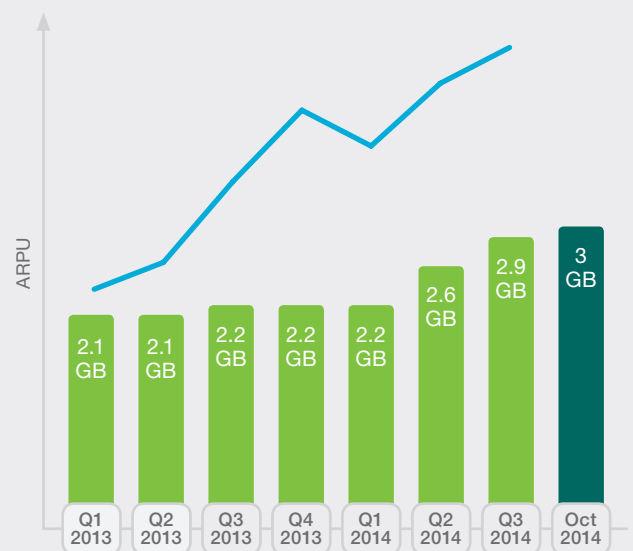
Leverage high performing networks

In markets where consumers get access to high speed networks, data consumption has increased. One example is South Korea, where network performance is very high in terms of LTE coverage and downlink speed. Operators are monetizing this by introducing premium tiers, with high monthly fees. The subsequent increasing data usage results in higher ARPU. Likewise, in a market in North America a clear relationship between network performance and market share has been observed. The operator with the best network performance measured in downlink throughput has the best market share development.

Device evolution drives usage

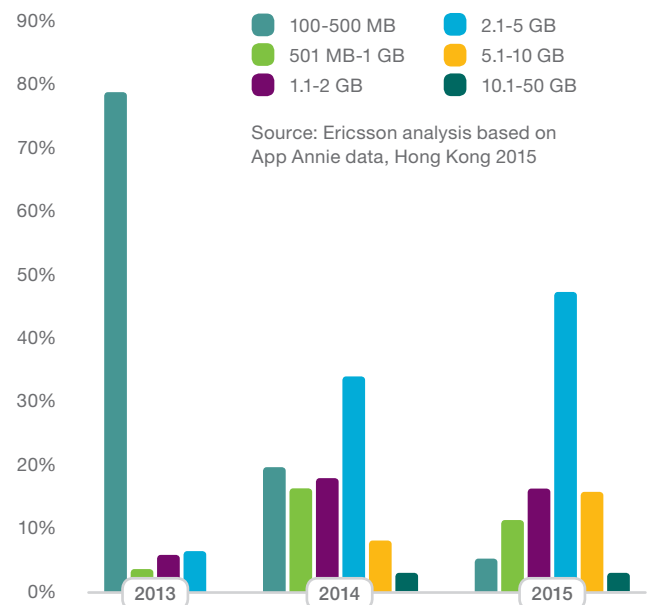
As described in trend 1, newer devices usually imply higher usage. For example, one operator in Hong Kong has successfully driven ARPU through a conscious device portfolio strategy. From January 2013 to January 2014, the LTE penetration among smartphones increased from around 30 percent to almost 90 percent. 50 percent of new LTE users also chose to upgrade their data plans, with the most common data plan changing from 500 MB/month to 5 GB/month. As a result, iOS users' ARPU grew 50 percent.

High speed networks increased average monthly data consumption and ARPU in South Korea



Source: Operator Investor Relations report, South Korea, 2014

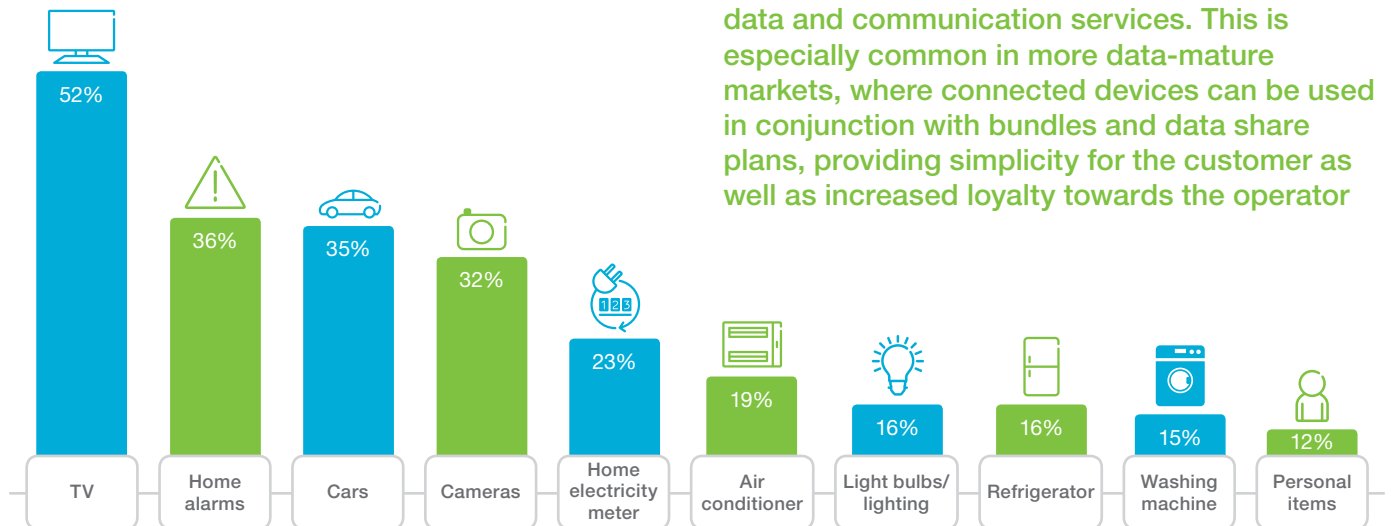
Most common data plan changed from 500 MB/month to 5 GB/month with LTE



Source: Ericsson analysis based on App Annie data, Hong Kong 2015

CONNECTING MORE DEVICES

Things consumers think should be connected to make them more efficient



Source: Ericsson ConsumerLab Analytical Platform 2015
Base: Internet users in 24 countries

Many operators are extending their offerings and incentivizing connections of multiple smart devices to stimulate usage of mobile data and communication services. This is especially common in more data-mature markets, where connected devices can be used in conjunction with bundles and data share plans, providing simplicity for the customer as well as increased loyalty towards the operator

Connecting tablets

Due to their larger screens, tablets usually drive more data usage than smartphones. Many operators are encouraging the connection of tablets. For example, one leading operator in North America offered discounts on LTE tablets when added to an existing data plan, leveling the price with a Wi-Fi-only device. Additional data was also added to the plan as an incentive to start using mobile data. Tablets have proven to be a useful tool both for businesses and education, and operators in other regions also promote the connection of tablets with specially designed tablet data bundles. One operator in the Middle East offers affordable data bundles, including an LTE tablet, purchased on a 12-month and 24-month contract basis. The plan is marketed as a way to help a new generation of students obtain a tablet.

Connected gadgets: cameras and watches

More and more gadgets are being connected, allowing people to receive and share information in new ways. Connected wearables such as smartwatches are gaining in popularity. New types of LTE-connected devices include smart cases, which provide an LTE connection for tablets with a Wi-Fi-only connection. Many operators allow these types of connected gadgets to be added to customers' existing shared data plans.

Communication over several devices

A North American operator offers a communication service where users can answer voice and video calls on one device and transfer to another device seamlessly. Contact lists and call logs are synchronized across the devices, creating a unified communication experience.

Connected home devices

A recent study published by Ericsson ConsumerLab¹ shows that consumers have a strong interest in connecting multiple devices in their homes. Connected devices in homes can include appliances such as washing machines, ovens, refrigerators, cameras and doors, as well as smart thermostats and lighting. These can often be added to customers' existing shared data plans.

Connected cars

Adding connectivity to cars enables a range of services such as navigation, real-time information about local traffic and nearby facilities, and entertainment. In Europe, EU regulators are mandating that cars have a built-in cellular connection for automated emergency calls. As with other devices, several operators allow connected cars to be added to existing data share plans.

¹ Ericsson ConsumerLab, Connected Homes (2015)

MONETIZING CONTENT, APPS AND SERVICES

An ever-increasing amount of content, apps and services are finding their way into people's smartphones. The rise of new content services presents operators with opportunities to expand their offering and add value for customers

Monetizing app and service usage

Along with the use of content, apps and services, traffic is growing faster than ever. The most direct way to monetize content, apps and services is through the bytes that run through the networks. Several operators are leveraging popular apps in their marketing to encourage people to use more data.

For example, one operator in North America is bundling video content with the sales of a premium device. The customer gets free access to the video archives for one year, motivating them to watch an unlimited amount of video. The operator benefits from the data generated by watching videos.

Partnerships with app developers for sales synergies

Many of the most popular apps, such as music and video services, come with a monthly fee. In some cases, the operator takes an active role in promoting and selling these apps. The direct reward to the operator would be a revenue share or commission associated with the sales.

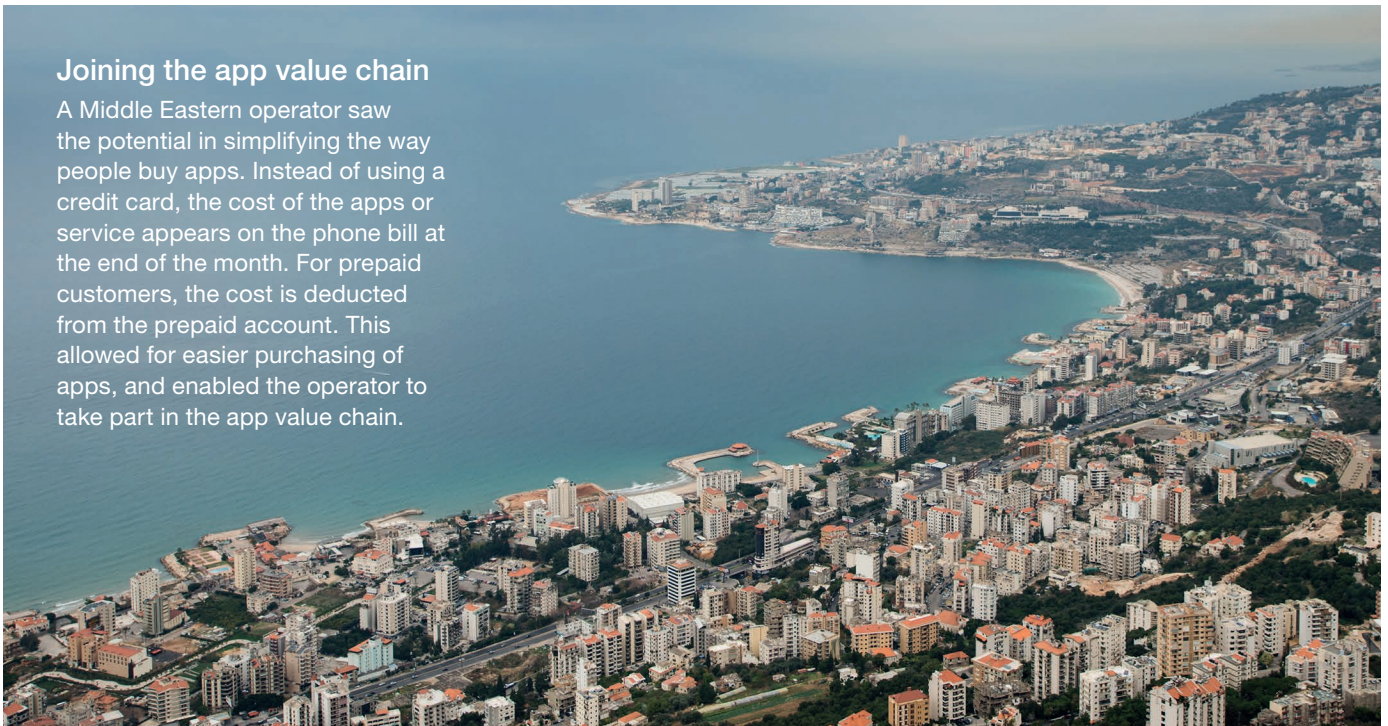
A major European operator quickly realized the demand for online music, and sensed the potential for new revenue. Through a tight collaboration with a popular music service provider, the operator was granted exclusive rights among its competitors to promote and sell the music service.

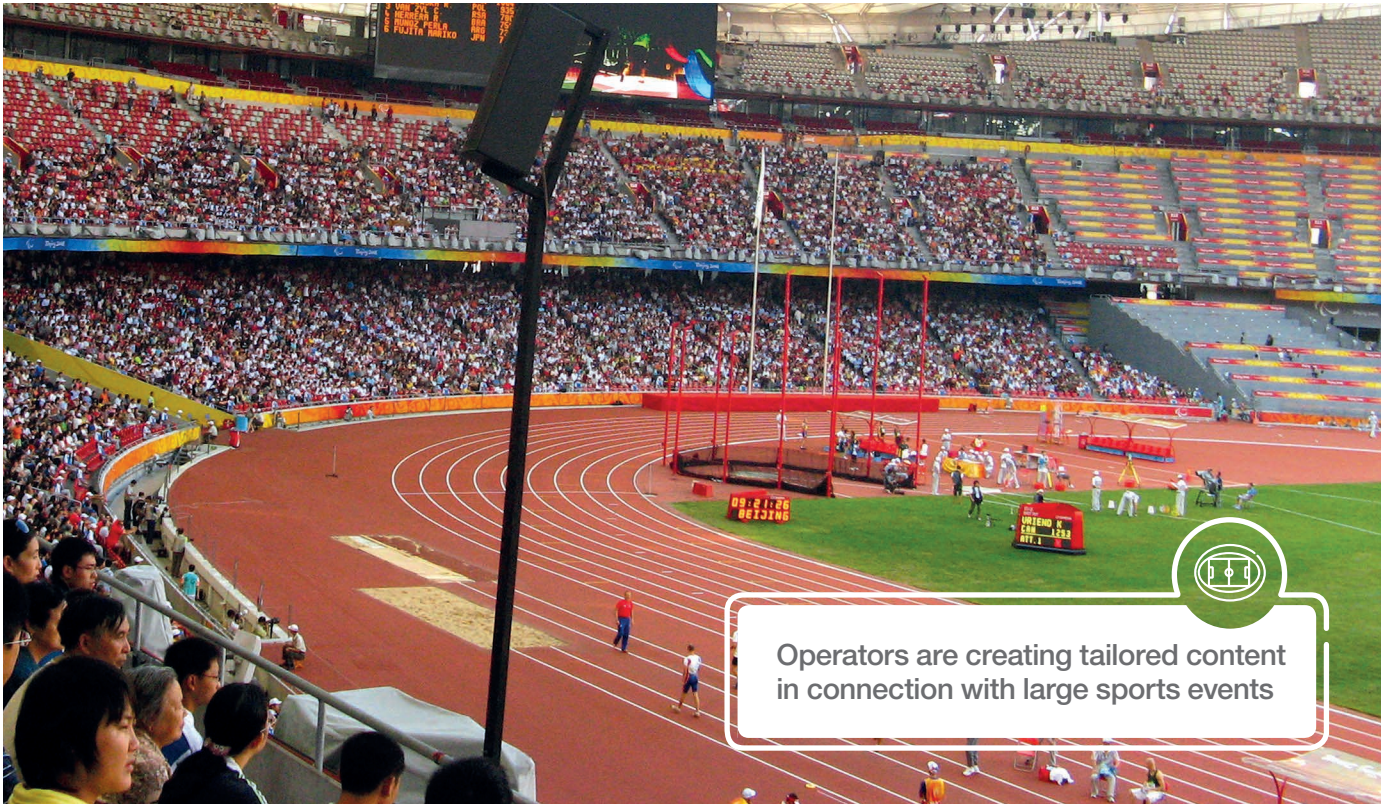


The operator purchased music subscriptions in bulk at wholesale price, and then acted as a reseller of the services. In addition to the direct earnings from app sales, the collaboration boosted the operator's brand value. A majority of the operator's new customers considered the music service to be a decisive factor in their vendor selection.

Joining the app value chain

A Middle Eastern operator saw the potential in simplifying the way people buy apps. Instead of using a credit card, the cost of the apps or service appears on the phone bill at the end of the month. For prepaid customers, the cost is deducted from the prepaid account. This allowed for easier purchasing of apps, and enabled the operator to take part in the app value chain.





Operators are creating tailored content in connection with large sports events

A major operator in Asia formed a joint venture together with a local content and game portal to launch their own social messaging app. The solution was differentiated from other messaging apps mainly through its ability to communicate with fixed and mobile phones – without a client being installed on the receiving end. The high usability of the app resulted in fast uptake – 11 months after launch the app had attracted 100 million users.

In collaboration with a video-on-demand provider, a multi-national operator in Africa has launched a video download service. The operator's customers can download content without any direct data charges. Content is paid per download and is deducted from the user's prepaid account.

In connection to large sports events, many operators are creating event-centric content and apps, monetizing people's demand for watching live sports. Operators are providing an array of services, from traditional match content to interviews, replays and group chats.

Using content, apps and services for segmentation and differentiation

Differentiation is essential to succeed in a competitive market. Content, apps and services are tools to create unique customer offerings that support and enhance the operator's brand identity. They could even help to address specific segments within an operator's own customer base, to create truly customized service offerings.

In the highly developed markets of Asia, exclusive content packages are becoming increasingly important as a way to differentiate from the competition. All operators offer their own app and content packages, including music, video, communication services, and shopping services. They see that apps and content contribute to brand identity and can be a key reason why customers select a certain brand over another.

Differentiation also steps into the content domain in Oceania. One operator has been promoting packages where consumers who sign up to a 24 month data plan receive 12 months unlimited access to a premium music

or video-on-demand service or content from a major newspaper. A competitor in the same market has been promoting 6 months' free access to a premium video-on-demand service when signing up for a 24 month mobile data plan.

A European operator extended its offering of fixed TV to also include mobile access to the service. The new mobile access was offered free of charge. No direct revenues were generated by the offering. Instead, the intention with this free offer was to add value to the existing users, thereby increasing customer satisfaction and loyalty.

As an alternative to communication apps provided by OTT players, some operators are offering their own IP-based communication services. The objective is to add value and increase customer loyalty and drive market share. VoLTE and Wi-Fi calling services are offered by several operators in North America, Asia Pacific, Europe and the Middle East. Additional services offered by operators include pre-call info, in-call sharing of content, video communication, conferencing and messaging.

TARGETING ADJACENT BUSINESS AREAS

Many operators are addressing new use cases and revenue opportunities by targeting their offerings to specific service areas. Home automation, security and surveillance, health care, the car industry, transportation,

utilities, financial services and insurance are just a few areas where operators are looking to leverage existing capabilities in order to expand their business

HOME AUTOMATION, SURVEILLANCE AND SECURITY

Many operators offer service packages to monitor and control devices in homes using a smartphone, PC or tablet. A variety of offerings exist, from operators providing integrated solutions, to setups where the operator bundles and resells third party solutions.



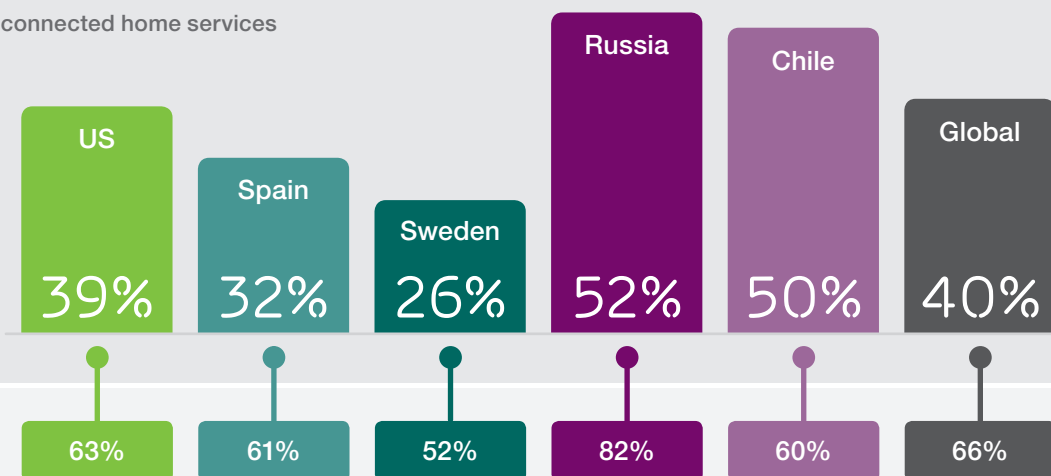
In North America, several operators are addressing the growing digital home automation and security market with integrated solutions. For example, one major operator offers three service packages at different price levels. Each package includes 24/7 professional monitoring and a set of standard devices such as control panels, key fobs and basic sensors. More advanced packages include additional feature devices such as a camera, door lock, and a variety

of sensors. Each plan includes a two-year contract plus device activation fees and credit approval. This allows operators to leverage existing operations capabilities when expanding into new business areas.

In Eastern Europe, one operator provides an app-based home video surveillance package in cooperation with a surveillance system provider. The subscription is based on a fixed weekly fee, which depends on the number of cameras attached, plus camera costs and installation fee. The service includes a fixed number of video view 'minutes' per week, which can easily be extended using SMS. This enables the operator to reach revenues beyond the family telecom budget and gives the app provider access to the operator's customer base.

Interest in integrated connected home services

Percentage with high interest in integrated connected home solutions



Source: Ericsson ConsumerLab, Connected Homes (2015)
Base: Online population in Chile, Russia, Spain, Sweden and the US

HEALTH CARE



A variety of health care applications are emerging where operators and partners join forces to create value for themselves and their clients. Remote monitoring, patient services, support forums, insurance, medical care and medication tracking are all examples of how mobile data services enhance the health industry.

In North America, a major operator is using new technology to enter the wearable medical device market. It provides services comprising a small wearable device that can detect falls, quickly identify the location, and automatically connect to a 24/7 call center for response and support. The service consists of a contract fee in combination with a monthly service charge.

In Latin America, one major operator provides a platform for online 24/7 health consultations together with medical partners. Users create a personal health record on the service portal where they can monitor data related to their health. The offers include discounts on medicine in pharmacies all over the country. The business model is subscription-based with a monthly fee.

MOBILE MONEY



Mobile money has the potential to address customers with new types of services not traditionally associated with operator business. This provides operators with the opportunity to create new service revenues and drive mobile data usage.

Mobile Money is emerging as a new business area in India. All major operators are focusing on providing a variety of mobile commerce services which allow users to make transactions, pay for utility bills, goods and services and perform other digital banking tasks. This generates income from transaction fees and increases customer loyalty. One operator has also created new upstream revenues through the launch of a B2B proposition targeting online retailers and allowing them to offer sponsored data to users.

In Peru, 70 percent of the population is outside the mainstream financial system. To engage the unbanked, one major local operator has established a joint project with a credit card company and local retailers to provide services such as money transfer, payments at affiliated stores and top-ups of mobile subscriptions. The service is available at more than 1,000 convenience stores and 2,800 locations for deposits and withdrawals.

SMART CAR SOLUTIONS



Mobile car connectivity provides the whole car ecosystem with new opportunities for business and operational development.

In North America, one major operator has established partnerships with car manufacturers to equip vehicles with connectivity for services such as car diagnostics and remote access to car functions. The car is equipped with a plug-in module for communication which is connected with the car owner's data share plan.

In Eastern Europe, a partnership between an operator and an insurance company has created 'smart car insurance' where transmitted data about driving behavior is used by the insurance company to estimate risks and define insurance policies. The metering device and the connectivity are free to the car owner, and paid for by the insurance company.

CONNECTED FARMING



Some operators are looking into ways to target the specific needs of certain industries such as farming.

In Sweden, a major operator aims to improve efficiency of milk production through mobile connectivity. Remote control of milking robots, sensors that collect various types of data, e.g. about the environment and volume of livestock feed, as well as remote control switches for food, water and temperature help the farmer to increase productivity.

In South East Asia, one major operator provided farmers with solutions to observe key indicators using near field communication and LTE technology. Sensors and a remotely controlled water supply enable the farmer to increase operational efficiency through real-time access to information.

TWO-SIDED BUSINESS MODELS

The evolving ICT industry comes with new use cases and business models. Many operators are exploring this opportunity to generate new revenues from outside their core business. By embedding mobile connectivity into specific services, new value chains are created where the revenue comes from the content provider instead of the consumer

Sponsored data traffic

In South Korea, an operator is addressing new business segments with sponsored data setups where the content provider allows the consumer to visit their website for free. Instead of charging the consumer, the content providers are charged for the usage under a B2B agreement. The business model resulted in more visits to the sponsored sites and increased chargeable mobile usage for the operator.

Operators are also targeting government and municipalities to sponsor services aimed at citizens. The service is free for the user and is paid for by public institutions. This is becoming increasingly common in education and healthcare, for instance.

In 2014, a South East Asian operator joined forces with the government and launched a project aimed at providing access to education for all students across the country via video conferencing. This allows the service provider to extend its reach with important content.

Mobile advertising

By taking advantage of their customer knowledge, operators are capitalizing on enterprises' needs to reach specific consumer segments with targeted promotions.

In Eastern Europe, an operator has launched a mobile marketing application that gives new ways for enterprises to reach out to their customers, providing categorized local offers. Through

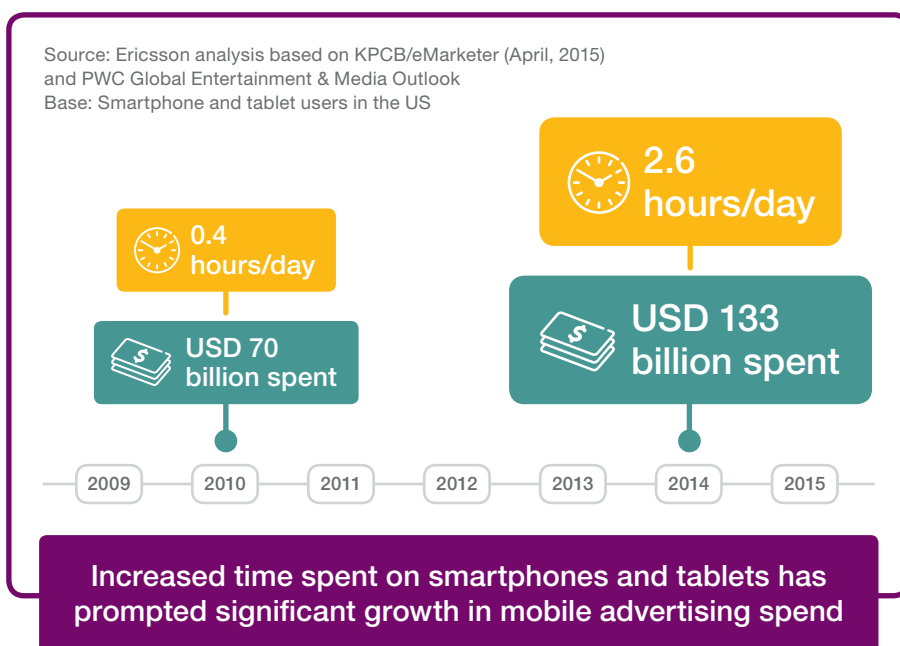
the geolocation function, the app presents the merchant's offers to the customers based on where they are. Premium offers are pushed directly to the users when they are in the proximity of a partner store.

In Africa, a global operator has launched a mobile advertising channel to help advertisers to reach their customers directly and precisely. The service allows advertisers to reach their target groups based on detailed subscriber information about location as well as demographics such as age, gender, interest and spend.

Content/app aggregator model

Some operators provide app stores to enable content ecosystems between consumers and app developers with revenue share models. This allows the operator to be part of the value chain, providing both a new revenue stream and improved customer loyalty. For app developers it provides a complementary distribution channel to the established app marketplaces with increased local visibility and promotion.

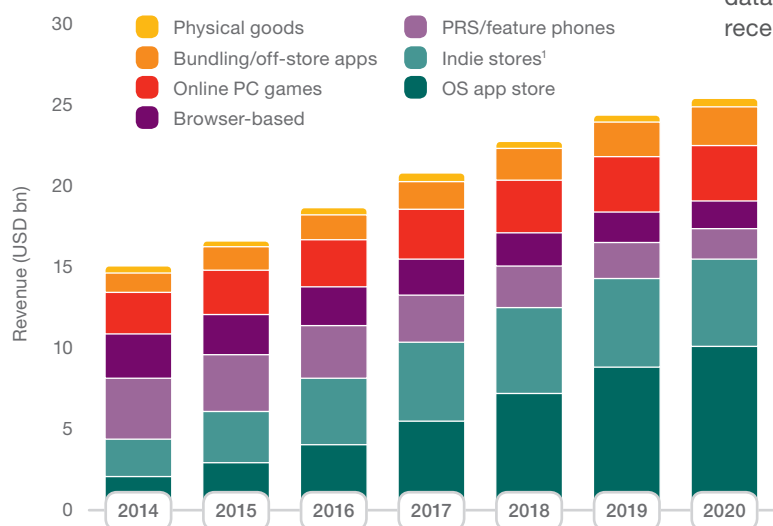
In South East Asia, a leading operator introduced an app marketplace, a service where smartphone customers get unlimited access to hundreds of free and premium Android apps for a fixed fee per month. The service also includes storage space and various discounts, and represents a new content ecosystem between the consumer, the developer and the operator.



OPENING UP NETWORK CAPABILITIES

Operators have a multitude of assets which they are capitalizing on in the new digital economy. Billing capabilities, big data and direct access to connectivity can be exposed to businesses and organizations for mutual benefit. By enabling third parties to use these capabilities and build their own service offerings, operators explore new ways to generate revenues

Estimated total transactional value of the global carrier billing market



Source: OVUM Knowledge Center
Carrier Billing: Forecast Analysis, by segment, 2014-20

USD 25.3
BILLION

Ovum's estimated value of the global carrier billing market in 2020, up from to USD 16.6 billion in 2015

Big data and analytics

Some operators are exploring how to use big data to improve their operations and gain revenues from new business opportunities. For example, unique consolidated data, potentially combined with proprietary tools or services, can be sold to enterprises and organizations in new business areas that utilize data, such as consumer research or social science.

In South East Asia, an operator has launched a cloud-based service that enables enterprises and organizations to use big data information for business decisions. The service provides a marketing platform for commercial area analysis and customer management. It uses an integrated consumer database and analytics engine, which allows enterprises to strengthen their business strategy and efficiency.

¹ Comprises all alternative stores to the OS app stores

Carrier billing

Some operators are leveraging their billing capabilities in order to allow third parties to charge customers directly for products. In a South East Asian market, both leading operators provide billing services for commercial applications – using direct carrier billing and leveraging their customer relationships to secure new revenue streams from industry verticals and OTT service providers.

Overcoming low credit card penetration in Asia, one operator is allowing its customers to purchase applications from an established app marketplace via operator credit or post-paid billing. This allows the operator to increase mobile data usage, create competitive advantages and potentially receive revenue from the app provider for each item sold.

Ecosystems for innovation

Some operators have begun to open up network capabilities to facilitate an ecosystem of application development. A global operator is offering developers an opportunity to build an Internet of Things proposition based on connectivity, programmability and live monitoring. The developer can combine plug and play modules with different capabilities – sensors, actuators, power – to create connected device services for enterprises and consumers. The services enable monitoring of, for example, temperature, humidity and light intensity in real time. The proposition is available for use in Europe, the US and Latin America.

In the Middle East, operators have started up diverse initiatives to support app development and usage. Examples of such initiatives include providing training and tools, starting up an innovation campus, and launching challenges to encourage entrepreneurs to create apps for education, health and entertainment.

ROAMING BUSINESS IN TRANSITION

In the last 5 years, smartphone subscriptions have increased worldwide from 500 million to over 3 billion. At the same time data traffic has grown by a factor of over 40. This increased smartphone usage has changed consumers' behavior, because it has encouraged and facilitated their need to be connected at all times

When traveling, staying in touch via emails and social media becomes even more important, leading to a stronger urge to always stay connected. With international travel increasing 20 percent over the past 5 years, a growing consumer demand for using mobile data abroad is expected.

Roaming charges restrict usage

According to an Ericsson ConsumerLab study, many international smartphone travelers state that they often adapt their communication behavior when abroad. Around half cut down on voice calls, 43 percent send fewer texts and a similar number use mobile data sparingly, compared to when at home. Some resort to using communication apps rather than voice calls and texts, while others switch off their phones.

Despite many being signed up to corporate mobile plans, half of all business travelers have to monitor costs and cut down on personal calls while abroad. A third of smartphone travelers claim that their employer sets an upper limit on usage or roaming expenses.

Current roaming charges and a lack of transparency in billing of voice and data services while abroad, have led to a preference among international smartphone travelers for Wi-Fi and alternative calling services, while potentially creating a negative perception of operators.

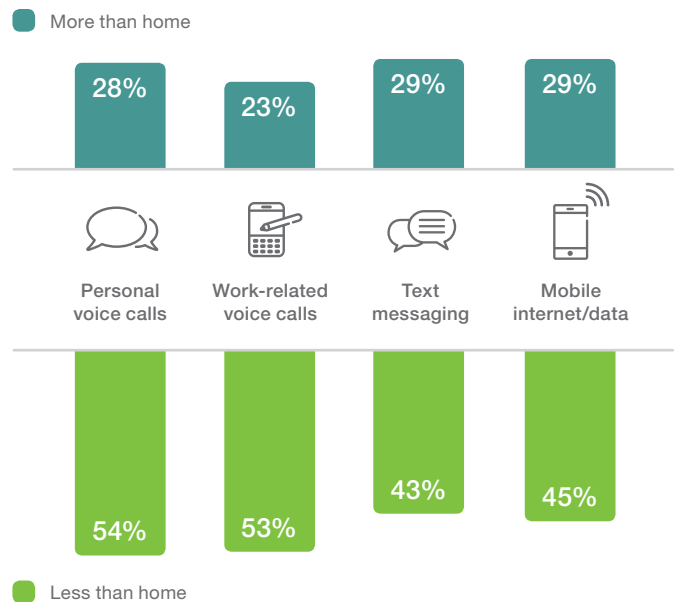
Major changes

With the recent EU decision to end roaming charges by June 2017 in Europe, together with a number of initiatives from several operators to change roaming strategies, it is clear that the roaming business is undergoing a major transition.

When roaming charging structures were designed, few could have imagined the development in both data usage and smartphone penetration that has occurred. The advantages of scaling mean that the production cost to serve roaming subscribers is significantly lower today.

Excessive charges that are difficult for consumers to understand create negative perceptions and are hard to justify

Communication while abroad compared to when at home



Source: Ericsson ConsumerLab, WiFi calling finds its voice (2015)

Base: All smartphone travelers across Brazil, Egypt, Spain, the UK and the US

in the long run. A similar situation was seen in the 1990s when video rental companies charged late return fees and this eventually enabled new disruptive business models to arrive.

Several operators have already started to address the issue of large roaming fees by offering consumers unlimited access to data from their normal data plan, either by a one-off payment each time they travel or by an addition to the monthly fee.

Changing roaming tariff structures globally will not be a simple transition, but given a latent service demand from smartphone users, the big question is whether this change is a threat or actually an opportunity for the industry as a whole.

GLOSSARY



2G: 2nd generation mobile networks (GSM, CDMA, 1x)

3G: 3rd generation mobile networks (WCDMA/HSPA)

4G: 4th generation networks (LTE, LTE-A)

Two-sided business model: Business model where operators make money from new types of customers rather than exclusively from users

API: Application Programming Interface

App store/marketplace: A digital distribution platform for mobile apps

ARPU: Average Revenue Per User

Basic phone: Non-smartphone

B2B: Business-to-Business

Big data: Data sets so large or complex that traditional data processing applications are inadequate. Often refers to the use of predictive analytics to extract value from data

CAGR: Compound Annual Growth Rate

Carrier billing: Allows people to buy digital content by adding the cost of a purchase directly to their mobile bill

EBITDA: Earnings Before Interest, Taxes, Depreciation and Amortization

Frontrunner: An operator with an annual revenue growth of 5 percent or higher, non-voice representing 25 percent or more of service revenue, and with a positive EBITDA

GB: GigaByte, 10^9 bytes

ICT: Information and Communications Technology

IoT: Internet of Things

LTE: Long-Term Evolution

MBB: Mobile Broadband

MB: MegaByte, 10^6 bytes

OTT: Over-The-Top. Referring to companies leveraging the business opportunities enabled by internet access over fixed and mobile infrastructure

Smartphone: Mobile phones with open OS, e.g. iPhones, Android OS phones, Windows phones but also Symbian and Blackberry OS

Sponsored data: A model where enterprises, governments and other organizations allow the consumer to connect to their services for free. The data is paid by the sponsor

Throttling: Intentional slowing of internet service to regulate traffic on individual and network level

Zero-rating: Delivery of mobile data free of charge to the customer. Could be applied down to an app or service level. The data is given free of charge by the operator

Ericsson is the driving force behind the Networked Society – a world leader in communications technology and services. Our long-term relationships with every major telecom operator in the world allow people, business and society to fulfill their potential and create a more sustainable future.

Our services, software and infrastructure – especially in mobility, broadband and the cloud – are enabling the telecom industry and other sectors to do better business, increase efficiency, improve the user experience and capture new opportunities.

With approximately 115,000 professionals and customers in 180 countries, we combine global scale with technology and services leadership. We support networks that connect more than 2.5 billion subscribers. Forty percent of the world's mobile traffic is carried over Ericsson networks. And our investments in research and development ensure that our solutions – and our customers – stay in front.