

14 LTE Broadcast Business Cases



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White Paper

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14 LTE Broadcast Business Cases

WHITE PAPER

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EXECUTIVE SUMMARY

Every day, mobile operators deliver large amounts of digital content to millions of mobile devices. And this amount is likely to grow in leaps and bounds as the use of multimedia content further develops...not only on the smartphone, but also on a wide range of new devices.

Today, when the very same data is delivered to multiple devices in the same area, each device gets the data in a one-to-one mode: this is the case for live TV streams, for instance, or downloads of popular files. Network resources are being used in a non-efficient manner, as this “unicast” method don’t easily scale up as the number of devices – and the volume of data – increases.

For this reason, the 3GPP standardization body created eMBMS (evolved Multimedia Broadcast Multicast Service), a point-to-multipoint content delivery technique working within LTE.

After a dozen of commercial rollouts of Mobile Broadcast, Expway has been deploying its technology solutions in a wide variety of business cases. The key learnings from these deployments, along with related projections, are summarized in this white paper in the form of business cases.

In each business case, five different aspects will be considered: (1) cost reduction for the telecom operator, (2) additional business with current subscribers, (3) capability to attract new subscribers, (4) quality of the experience for the end user and, finally, (5) ease of implementation (from both a technical and a business point of view).

Fourteen different use cases will be explored, along with an attempt to quantify the economic impact of each on a subscriber base of 25 million.

Of course, the relevance of each use case varies from one operator to another, because of their relationship with the ecosystem (such as content owners, regulators, ad agencies and broadcasters), the maturity of the wired broadband and the regulatory environment. Also, LTE Broadcast (eMBMS) is still a new technology and some of the business cases presented in this white paper, may require some improvements to the current technology.

The main conclusions of this study are that:

- (1) One use case rarely justify the launch of LTE Broadcast, but the pay back can be quick – and additional, significant profits can be realized – when running various use cases at the same time.
- (2) Additional revenues together with cost savings could lead to an aggregated 300 million euros (US \$400 million) per year for on an operator with 25 Million subscribers. It represents more than 1 Euro (US \$1.35) per subscriber per month of increased margin.

WHY eMBMS, AND HOW CAN WE ANALYZE ITS BENEFITS?

By 2017, more than 7 billion users worldwide will get their primary information from mobile devices, and monthly data traffic will exceed 10 exabytes. Video will account for more than 70 percent of the data.

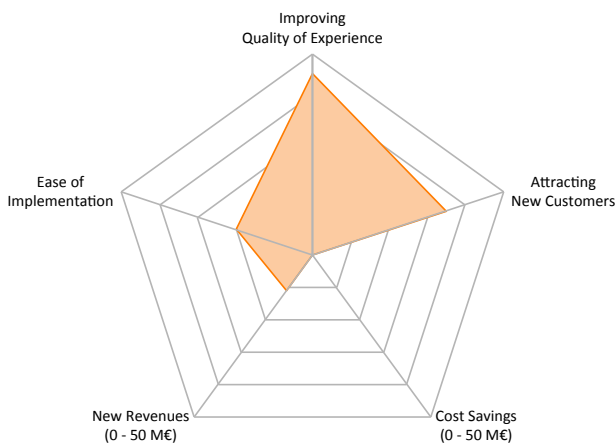
This unprecedented trend can be a hugely profitable opportunity for carriers, but only if they can meet the challenge of providing consumers with speedy, uninterrupted and reliable data, with a special focus on high-quality video services. Not surprisingly, users are getting more demanding, and wireless networks are now frequently overloaded.

LTE, alone, is not enough to keep pace with skyrocketing data demand, especially given projected video growth and the move to HD quality.

LTE Broadcast is an optimization layer of LTE, allowing for an extremely efficient distribution of popular content. As it is only a software update on the server side as well as into the device, it is a rather small investment for the operator.

LTE Broadcast is also a great tool to differentiate 3G from 4G and as a consequence speeds up 4G adoption.

Despite this high level benefits, operators have all expressed the same desire to better analyze how they can use this technology and what benefits they could get by doing so. For that reason, we have identified and analyzed 14 business cases along the five following axes, represented below by a radar chart:



Radar Chart Example

- **Attractiveness** represents the capability of these new services to help telecom operators to gain new subscribers.
- **Quality of Experience** represents the improvements of the user experience brought by LTE Broadcast over LTE Unicast.
- **Accessibility** represents to the ease of implementation from a technical and business point of view.
- **New Revenue** represents the total revenue that can be generated by the opportunity in one year.
- **Cost Savings** represents the economic gains in bandwidth by using eMBMS in one year,.

14 LTE MULTICAST BUSINESS CASES

Use Case 1 – Mobile TV

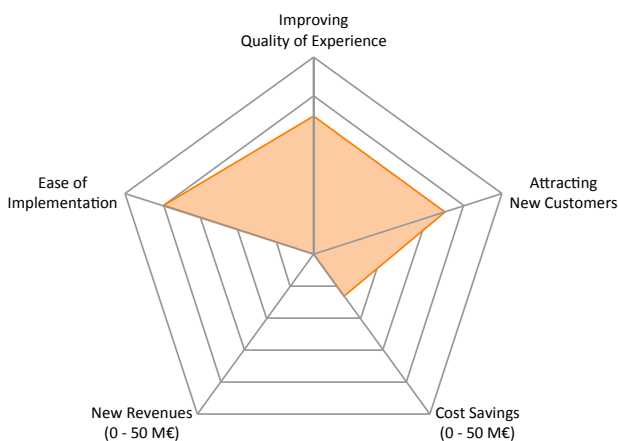
According to OMVC, nearly 90% of US mobile device owners express interest in watching live TV news and TV weather programming while on the go.

With TV Everywhere, users can access a selection of premium Live TV channels and TV programs, which are delivered in HD quality and protected using a state-of-the-art CAS or DRM system. By paying a few dollars to supplement their quadruple play package, end-users can get their favorite TV channel on the go.

Also, TV can be offered outside of the data package (below analysis).



The Mobile FiOS App launched November 2013, offers 75 channels of live television.



Business Case 1 - Mobile TV is offered in the users data package

- **End-User Benefits** – Users always have access to HD-quality live TV, despite saturation of the network. They can also watch their favorite local news and television shows for free (out of the data plan).
- **Business Model** – 1) A subscription model, added to the carrier’s monthly bill. 2) Access to specific events, such as sport games, can be purchased directly via the App. 3) Possible revenue sharing between the carrier, the ad network and the local broadcaster. 4) Offered in the data package to attract new subscribers.
- **Why eMBMS?** – The video quality is in HD, regardless of the number of users watching the content. Quality remains HD and the service remains always on, even during major sport events or breaking news drawing a mass audience.

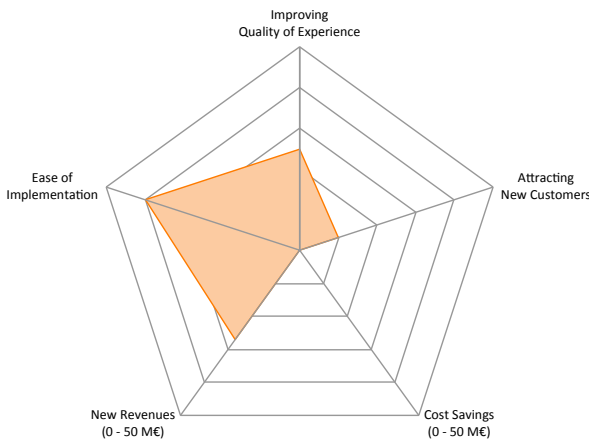
Use Case 2 – Digital Radio

According to Citrix ByteMobile Mobile Analytics Report (for the second quarter of 2013), mobile audio – particularly music – represents 12 percent of mobile data volume in North America.

LTE Broadcast can progressively replace traditional FM delivery and provide digital-HiFi quality together with new multimedia content, such as album covers or videos (talk show), even in crowded areas.



In France, the 13 most popular FM radio stations attract 81% of listeners and account for 61% of all revenue.



Business Case 2 - The radio service is offered as a premium, ad-free, service to car owners only.

- **End-User Benefits** - Users can benefit from high-quality radio with perfect sound in HiFi quality, even in very crowded areas (such as in public transportation or in traffic jams), even better, with additional interactive and ancillary services including video and images.
- **Business Models** - 1) monthly subscription fee similar to XM Sirius in the United States (XM generates US \$3 billion in revenue and \$1 billion in net income, with only 25M subs), 2) radios pays for transmission fees (a shift of business from Broadcast to Telecom).
- **Why eMBMS?** - Thanks to eMBMS, radio channels can be broadcast to all users within the range of a cell, included traffic jam in cars.

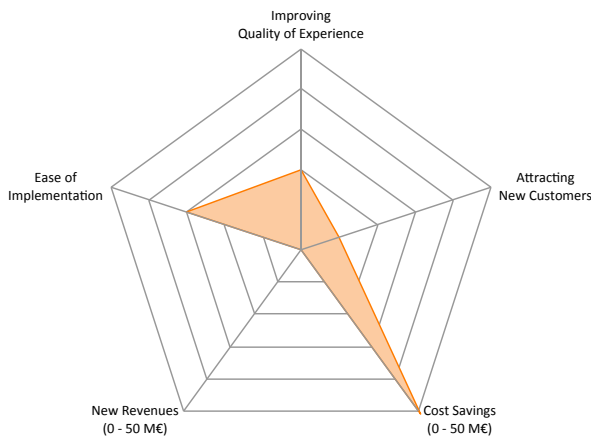
Use Case 3 – Video Kiosk or Video on Demand

The authenticated viewing of shows from cable or satellite networks is growing exponentially, registering a 246 percent gain year over year, with nearly 21 percent of U.S. households using the technology. In fact, TV Everywhere is growing faster than other video streaming services such as YouTube, Hulu and Daily Motion.

The video are pushed and stored periodically with new programs, movies or the most recent news. The user can even subscribe to receive only his favorite shows or content on a specific theme. Older shows are automatically removed.



The 20 most popular BBC shows generates 12% of BBC iPlayer traffic



Business Case 3 - The most popular show of the day is pushed to the device (based on BBC stats)

- **End-User Benefits** – The user always has access to some fresh content in HD quality videos regardless of whether she is connected or whether the network is congested.
- **Business Model** – 1) A subscription model, added to the service provider’s monthly bill. 2) Specific premium content, such as recent movies, can be purchased independently. 3) The user’s data plan is impacted by the data watched (and not pushed) by the user.
- **Why eMBMS?** – The top most popular contents are pushed to the device, creating huge savings for the operators.

Use Case 4 – Connected Car

According to an Arbitron In-Car Study, people spend between two and three hours a day in their cars and make 22% of their purchase decisions while driving. In-Car Media has the potential to reach nearly all Americans each month.

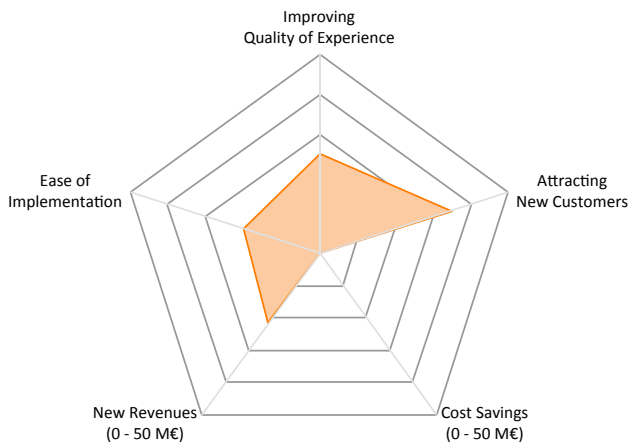
A recent Atos Origin report states, "Within the next three years, every new car will, to a greater or lesser extent, be a connected car. When most drivers already have a smartphone in a cradle on the dashboard, this deeper connectivity is inevitable. The real question is not 'if' - it is a question of 'how far can you go.'"



NTT DOCOMO announced an agreement with Tesla Motors, to provide mobile communications support that will enable Tesla drivers in Japan to enjoy high-resolution maps, online music such as on-demand Internet radio, and much more via the vehicle’s 17-inch touchscreen.

In-Car Entertainment and services can be offered for the whole family, using LTE Broadcast:

- Live TV and Netflix-type of content, for those riding in the backseat
- Location-based services updated in real time (such as traffic reports, lodging information, gas price alerts, map updates, and restaurants)
- Real-time incentives from retailers, according to fuel tank status and proximity
- Updates on available parking spots in a certain area, designed to reduce the cost and frustration of finding parking in a congested city



Business Case 4 – Monthly subscription fee for only 3% of the operator subscribers

- **End-User Benefits** - For the driver, having instant access to local information reduces stress. And keeping the kids entertained and quiet on the backseat on long road trips is also a bonus!
- **Business Models** - 1) subscription-fee for data services, 2) some ad revenue with local ads.
- **Why eMBMS?** - Its unparalleled capability to deliver voluminous content, Live TV and files to moving devices is an obvious benefit. What's more, the technology is uniquely able to support cell congestion in traffic jams (roughly estimated at 600 cars for one cell).

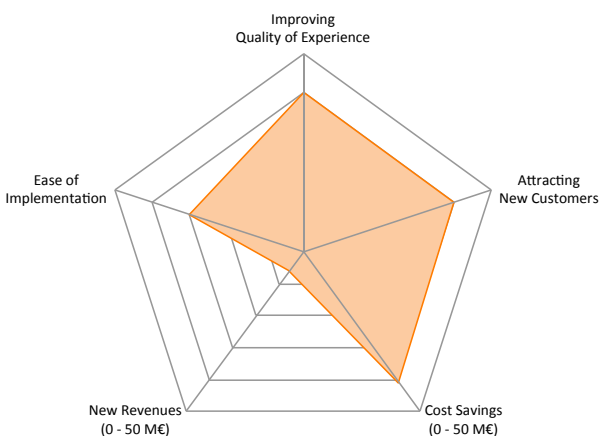
Use Case 5 – Fixed LTE Quadruple Play

Carriers already use LTE to implement broadband services in rural areas through Fixed LTE Gateways. The household members log in with their password to the gateway, and connect to internet using Wi-Fi to their tablets, smartphones or laptops. Television is connected to the home gateway through HDMI cable.

LTE Broadcast can be then used to enhance this offering with Live TV and VoD content, pushed to the gateway.



According to Infonetics Research, broadband connections shift from DSL to Fiber or LTE. LTE will represent 10% of the gateway revenue in 2018.



Business Case 5 – Offering quadruple play to rural areas brings differentiation and new revenues

- **End-User Benefits** – Users who have poor or no wired broadband access can reap the benefits of a quadruple play offer.
- **Business Model** – Similar to traditional wired broadband: a subscription fee for all, including voice, Internet, TV and VoD. Also pay-per-view can be included as an extra.
- **Why eMBMS?** – The operator can offer quadruple play even in areas where wired broadband is not available, thus attracting new customers and generating new revenues.

Use Case 6 – Local Information such as Coupons

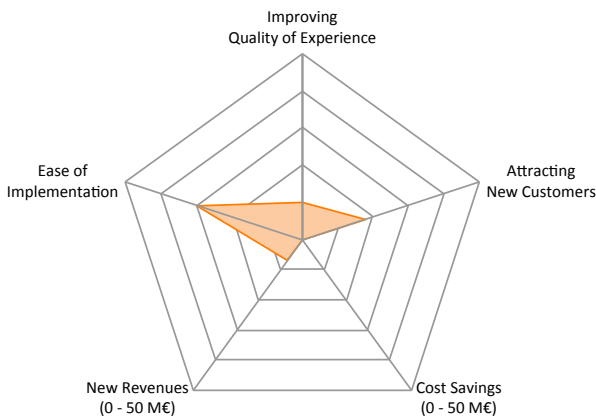
Shopping Mall Apps provide special promotions, loyalty discounts, and information on sales. They serve to nudge the consumer to cross the threshold and walk into the shop, bringing extra revenue to the shopkeeper.

This “shopping companion” can target a myriad of different consumers: the brand conscious, who only buy designer labels; bargain hunters; shoppers who enjoy being one of the “chosen elite” in secret sales promotions, etc.

Similarly, **cities or museum** can send short image or web page to the users.



Myeongdong shopping area in Seoul features mid-to-high priced retail stores and international brand outlets. Its floating population is around 2 million a day.



Business Case 6 – A nationwide ads delivery

- **End-User Benefits** - Users receive coupons during their shopping extravaganza and simply “wait to be tempted” by the notifications popping up on their smartphone or other personal device. City information or museum information can be pushed as well.
- **Business Model** – 1) Revenue share with a coupon company, or directly with the local shops or the mall owner, 2) Distribution fee from the local entities willing to push contents.
- **Why eMBMS?** - Telecom cells in crowded places such as malls or shopping streets are usually saturated, preventing this new generation of local services.

Note - This Use Case can apply to a wide variety of scenarios, such as tradeshows. As an example, CES 2013 had 150,000 visitors who came to Las Vegas for five days. More than 3000 exhibitors demonstrated over 20,000 different products within an area of 180,000 square meters. One TV channel was running 24/7 for promoting the various activities (such as restaurants and night clubs) in Las Vegas but was only visible on Hotel TVs and not on mobile devices. Such a TV service could be made local, by area, for a visitor walking along the Las Vegas Strip and within the exhibition halls.

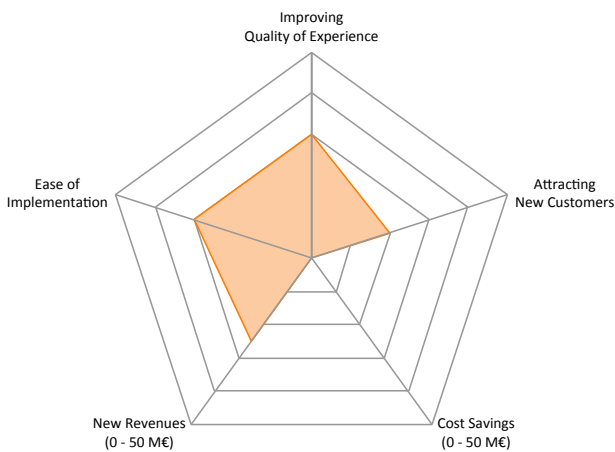
Use Case 7 – Wireless Emergency Alerts

In a crisis situation, the demands placed on communication systems often exceed overall capacity. This presents a problem for both the people facing the crisis and the first responders who need access to critical information, to manage the situation.

eMBMS is a perfect way to deliver very time-sensitive information to a myriad of users, in a scalable manner. eMBMS can be considered an extension of cell broadcast, with the benefits of running in SFN mode and having the ability to deliver MM messages.



Five adults and 29 children were in the Sports World Complex soccer dome when the manager received a tornado alert. Within two minutes after evacuation, a tornado hit the dome,



Business Case 7 – Emergency Alert Service is sold to first responders

- **End-User Benefits** – Information is delivered and processed on their personal devices, available immediately, and with pictures or videos.
- **Business Model** – More a social responsibility than a business opportunity, although it can be sold to first responders or any other federal authority.
- **Why eMBMS?** – Today, emergency alerts are distributed using cell broadcast technology, such as with the WEA system in the US. These alerts are limited to 150 characters. eMBMS allows one to augment emergency alerts with graphics such as pictures or videos. In natural disasters, connections are usually jammed, and eMBMS can become a lifesaver.

Use Case 8 – Stadium App

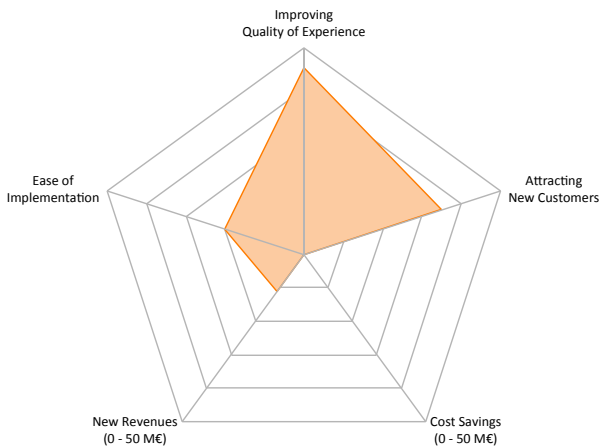
In a football stadium full of avid fans, it would be easy to find 5,000 users who would like to see a replay of the last touchdown on their own device – and would be willing to pay for it! A Stadium App can grant them access to multiple camera angles, feeds and statistics from live broadcast video, directly on their smartphone, with consistent and reliable quality.

And for those fans that do not want to miss any match, the Stadium App can also cover a different game in a different city. An extra subscription is a small price to pay for those true-blue sport fans, who are more than willing to “multitask” between the game going on in



During Indy 500 car racing 400,000 persons are packed in the arena

front of them and another one, on their smartphone.



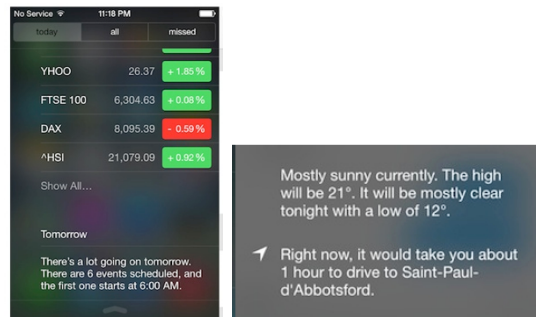
Business Case 8 – One single major national sports with pay per event business model

- **End-User Benefits** – Fans have new ways of enjoying their sporting event within the stadium: they get instant access to statistics, live feed from the field or race track, or replay of the previous touchdown or finish-line crossing. They also can simultaneously enjoy games and other sporting events that are occurring in other stadiums around the country.
- **Business Model** – 1) Revenue share with the stadium or the sports league, 2) InApp purchase for camera angles, replay, statistics, etc...
- **Why eMBMS?** – Telecom cells are saturated in crowded places such as stadiums, precluding the possibility of any of these new generations of local services.

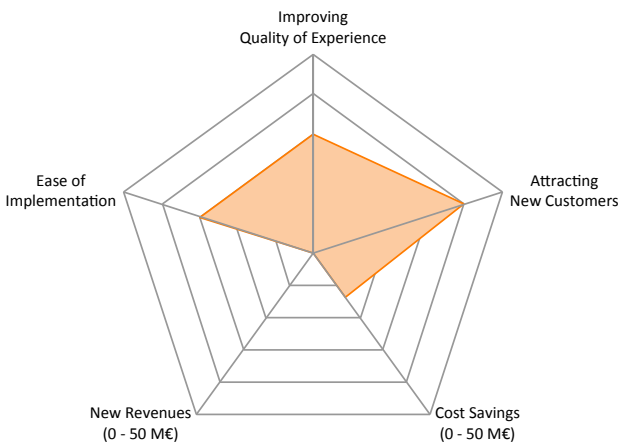
Use Case 9 – Data Feeds & Notifications

In previous years, iPhones have proven to be a great vehicle for the audience of Yahoo! Finance Ticker: This partnership has multiplied the traffic at the site several times over. The same idea can be brought to devices that support eMBMS, but with using far larger amounts of data and mass.

The possibilities are endless: Weather forecasts, headlines, news, stock market results, metro alerts, the most-viewed local RSS feeds...all updated in real-time with crisp images and short HD video clips.



In iOS 7, Apple has included a new Notification Center feature called Today, which the company says is designed to provide users with the day's events at a glance, including information like weather details, and traffic reports.



- **End-User Benefits** – Users get access to local or national information with no waiting time, and can even receive notifications. The data feeds are processed immediately and stored, if needed.
- **Business Model** – 1) A subscription model for the end-user who is hooked to the reactivity of the application and the immediate availability of the information, 2) A transmission fee for the service providers who wants their information to reach the user, in real time
- **Why eMBMS?** – It is the most cost-effective way for the operator to dedicate a low bandwidth

Business Case 9 – Delivering rich notifications to users

channel for the type information (whether local, regional or national) everybody likes to have.

Use Case 10 – e-Newspapers and e-Magazines

The news media still has an enormous audience in the U.S. Digital news audiences grew 17% last year. Mobile readers go to news sites more often, spend more time per visit, and read more articles per visit than desktop readers.

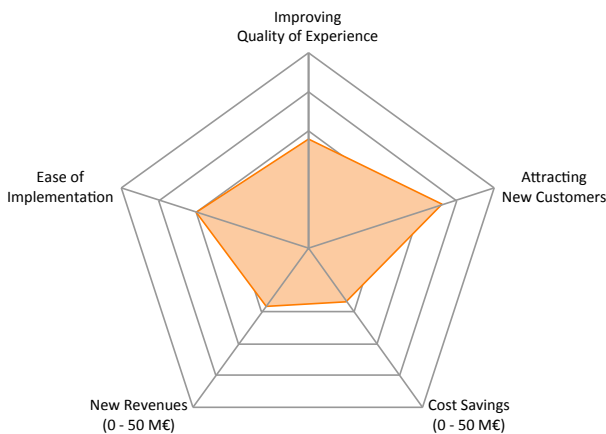
E-newspaper and e-magazines are embedding more and more videos. However, they are becoming longer and therefore take longer to download, and they are generally accessed at the same time, by many. The App uses eMBMS to download and cache the e-news publications on device memory.

As a result, the end user can browse his favorite newspaper, every morning, without any painfully long downloading time.



USA Today eNews App

USA TODAY reaches over 7.2 million Mobile Users per month.



Business Case 11 – Delivery of few newspapers and magazines nationwide

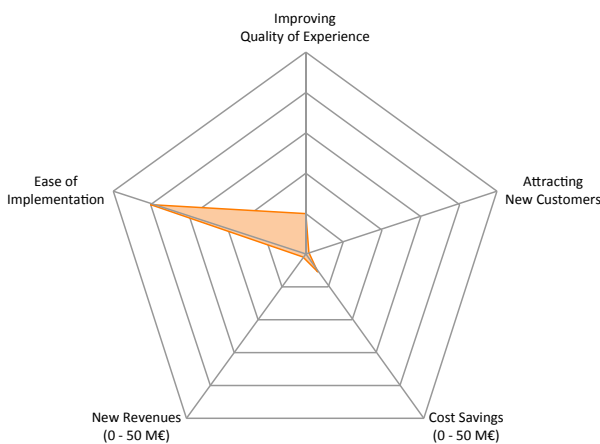
- **End-User Benefits** – The user doesn't have to wait while downloading her e-newspaper or e-magazine; it is already stored on her device on the early hours of the morning. It is also updated all day long so that the latest news can be read even in the middle of the day.
- **Business Model** – 1) The carrier gets a cut on every subscription, through its partnership with the content owners. The operator-powered app gains momentum compared to OTT apps, with no quality management. 2) The content providers pays transmission fee to the carriers.
- **Why eMBMS?** – eMBMS allows the service to scale perfectly. Bandwidth consumed by the service is bounded, and the end-user experience is positive, as she doesn't have to wait to browse her e-Magazines anymore. e-Magazines can be updated during the day with breaking news, including HD videos.

Use Case 11 – Firmware/OS Updates

The firmware/OS of Smartphones and Tablets need to be frequently updated by manufacturers or operators, so that bugs can be corrected and new features added.

Using Mobile Broadcast, operators can deliver to their subscribers firmware and OS updates for the most popular devices. Millions of users can simultaneously get firmware and OS updates.

Updates can be either received automatically or only if the user “opts-in.” For example, a 500MB OS can be broadcasted to millions of users in less than one hour.



Business Case 11 - 2 OS and 10 most popular apps are updated using LTE Broadcast



ANDROID 4.2

The size of firmware and OS updates for smartphones and tablets ranges between 500 MBs and 1GB

- **End-User Benefits** – The user seamlessly has the most up-to-date version of its app and OS on his device. It doesn't impact its data package.
- **Business Model** – The carrier may charge a fee to the manufacturer for every software update. Off-loading has a big cost-saving impact for both the carrier and the manufacturer.
- **Why eMBMS?** – An operator who has millions of subscribers with the same device will benefit from the scalability of eMBMS for broadcasting software updates.

Use Case 12 – Pushed Video Ads

Pre-roll and video advertising are becoming a mainstream source of revenue for the mobile internet.

However, the user experience provided by the current apps or mobile website is extremely disappointing. Ads are vital for the mobile web economy, but their intrusiveness and data cost are becoming increasingly frustrating for the end users.

Indeed, the end user is showed something he doesn't

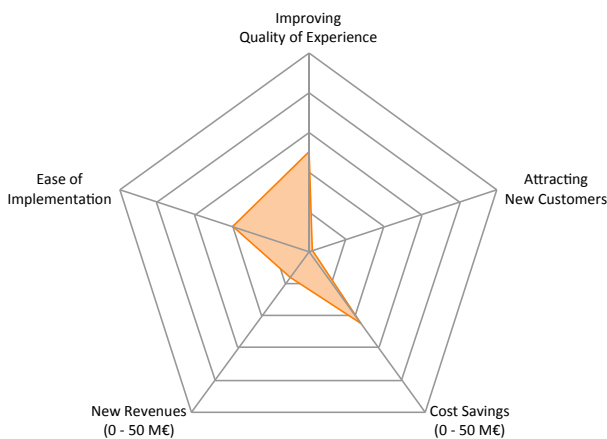


Full screen high value ads, displayed

want necessarily to see; yet he must pay for it – as it has an impact on his data cap – and he has to wait for it. In many situations, the ad video is jerky and the overall viewing experience is poor.

eMBMS allows the ads to be pushed in background, into the devices. Before being displayed, the app or the web browser confirms locally whether the ad is in the eMBMS cache. If so, the ads are displayed immediately, with clear video of beautiful quality.

According to Gartner, Global mobile advertising spending is forecast to reach \$18.0 billion in 2014. Display formats will make up most of the revenue, and video will show the highest growth.



Business Case 12 – 100 ads are pushed to the devices every week

- **End-User Benefits** – The user is satisfied, as the ad delivery is not counted in her data package, the video starts immediately, and the video is in HD. Media agencies are satisfied because they can deliver better quality ads, with more impact.
- **Business Model** – 1) Carriers may charge a fee to the media agency by running a small ad server operating on the phone, 2) Operators can share the revenue generated by the display of the ads with the service provider as a fair reward for ensuring the quality of the ads and a good experience for the user.
- **Why eMBMS?** – eMBMS makes it possible to deliver high-value ads in the background, at a reasonable cost.

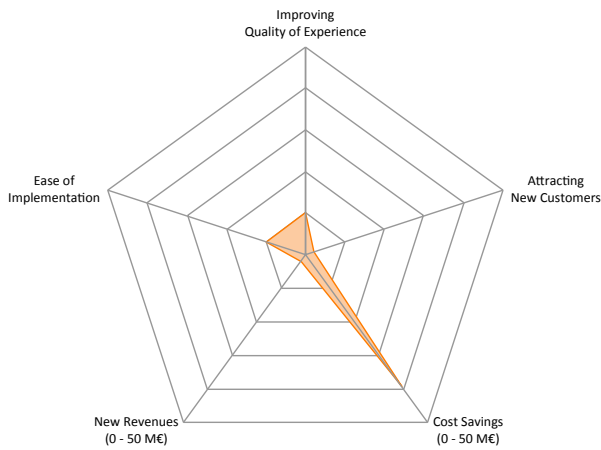
Use Case 13 – Last Mile CDN

Operators are using various routers and caches to bring content closer to the end-user. The network analyses which content is the most popular and, therefore, decides whether it should be cached. Unfortunately the last mile – between the eNodeB and the device – is never optimized and remains the bottleneck in many situations.

eMBMS allows the CDN to extend its reach down to the terminal, where the last cache resides. Smart management of the content popularity and some prediction algorithms can extend the CDN down to the device, for both files and video streams.



For years, CDN provider have been focused on optimizing the core networks but not the last miles i.e. the last link between the user device and the cells



Business Case 13 – Caching the 3 most popular files per city everyday

- **End-User Benefits** – Users are satisfied, as browsing is faster since the web browser cache is pre-populated with content likely to be watched.
- **Business Model** – While this scenario does not generate additional revenue for operators, it brings a cost saving. Users continue to be invoiced on the data they consume.
- **Why eMBMS?** – eMBMS can deliver the most popular file or video streams, transparently, to the end user at a reasonable cost.

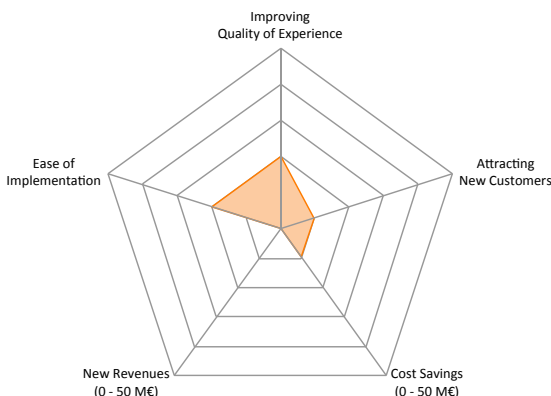
Use Case 14 – Internet of Things (Smart Meters)

A smart meter is an electronic device that records consumption of electric energy in intervals of an hour or less, and communicates that information (at least daily) back to the utility for monitoring and billing purposes.

Smart meters run a software program and can be configured remotely by the central system. We believe that as the number of smart meters grows, their management and configuration will become cumbersome and costly for the central operator.



According to Telefonica, more than 800 million smart meter devices will be installed worldwide by 2020



Business Case 14 – Smart meters and Connected Objects.

- **End-User Benefits** – There is no need for configuration, as smart meters are updated and controlled remotely. They are “plug and play.”
- **Business Model** – Carriers can sell the service to keep the fleet always updated to the smart meter operator.
- **Why eMBMS?** – At a reasonable cost, eMBMS can deliver all the configurations and software updates needed to manage and maintain the fleet and keep it up-to-date.

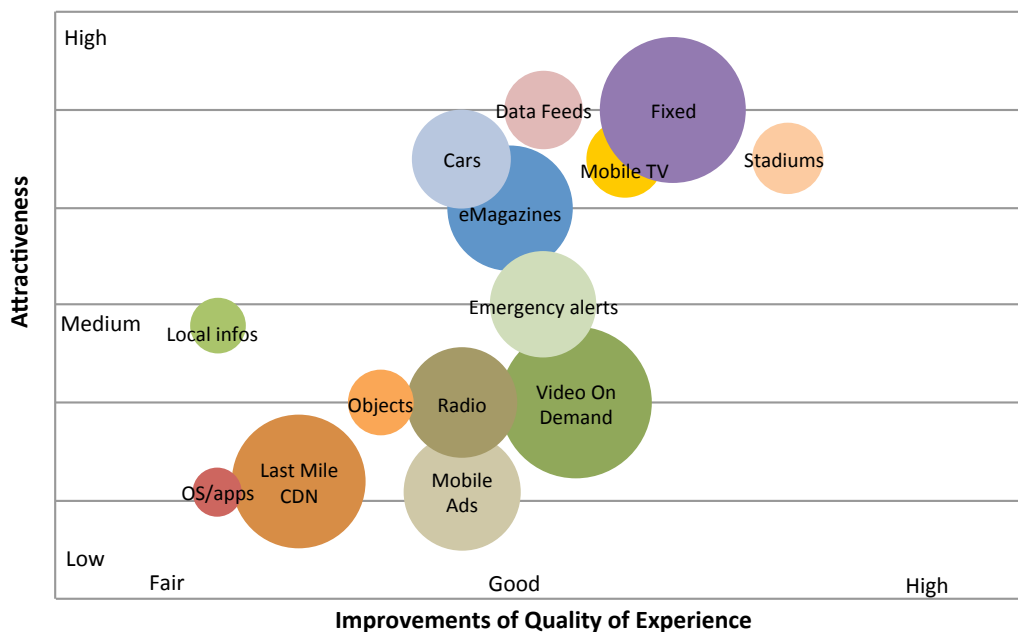
CONCLUSION

The introduction of 4G for mobile devices – coupled with the dominance of large and bright screens in mobile devices – is disrupting the landscape of mobile communications, driving a profound change in carriers’ business models and services that can be provided to subscribers. The higher-speed capabilities of 4G devices have shown consumers that they don’t need to be anchored to a PC or a laptop to access rapid, stable HD video and data.

LTE Broadcast serves consumer demand and provides carriers with a cost-effective strategy to satisfy this hunger for content. More than a mere collection of a few 3GPP releases, LTE Broadcast is a well-planned technology evolution that will play a pivotal role in the future of wireless.

Our analysis shows that an operator can launch a set of services to its mobile offer and can benefit significantly from. On the 14 business cases studied, we believe that LTE Broadcast represents a total opportunity of 300 million Euros per year, split across approximately 50% of new revenues and 50% of economy in transmission costs.

Below is a diagram positioning the 14 use cases analyzed in this white paper. Note the size of the bubble representing the monetary benefits of the use case (that is, the sum of new revenue + the optimization of network resources).



*The details of this analysis are available on demand
Please send an email to LTE_businesscases@expway.com.*

To conclude, LTE Broadcast is a simple technology available at a reasonable cost for operators. As covered in this white paper, it can be used in a wide variety of applications to deliver a better experience to users – at a significant cost savings – and help grow new business opportunities.

ABOUT EXPWAY



Expway has focused on Mobile Broadcast for more than seven years. During this time, our company has gained a significant share of the global Mobile Broadcast market. Knowing how to work with large telecom operators and major system integrators is very much a part of Expway's DNA, as they represent our main customer base.

Showcasing this capability, we have been working since 2002 with the NTT Group – including NTT DoCoMo, NTT Data, NTT R&D – on various projects. A recent project they selected us for is "NOTTV," a File Casting service using Mobile Broadcast. The work started with two years of specification, prototyping, development, testing and fine-tuning of the product to suit their needs. The project culminated into a service launch on April 1, 2012.

Since then, Expway Middleware has equipped more than 10 million "NOTTV" compliant devices.

Expway is now deploying its solution in all the major LTE Broadcast markets including US, India, Europe and China. Its terminal software is powering several devices from tier one manufacturers and chipset vendors. Its server software are used for the upcoming 2014 deployments by a tier one Network Equipment Vendor.

We are making sure that our software can implement the various scenarios mentioned in this white paper. Our technology is in its 5th generation and we can safely say that Expway offers the world's most tested and commercially deployed Mobile Broadcast solution. With our keen focus on the Mobile Broadcast market and continual innovation, our products have reached a unique level of performance and set of features.

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