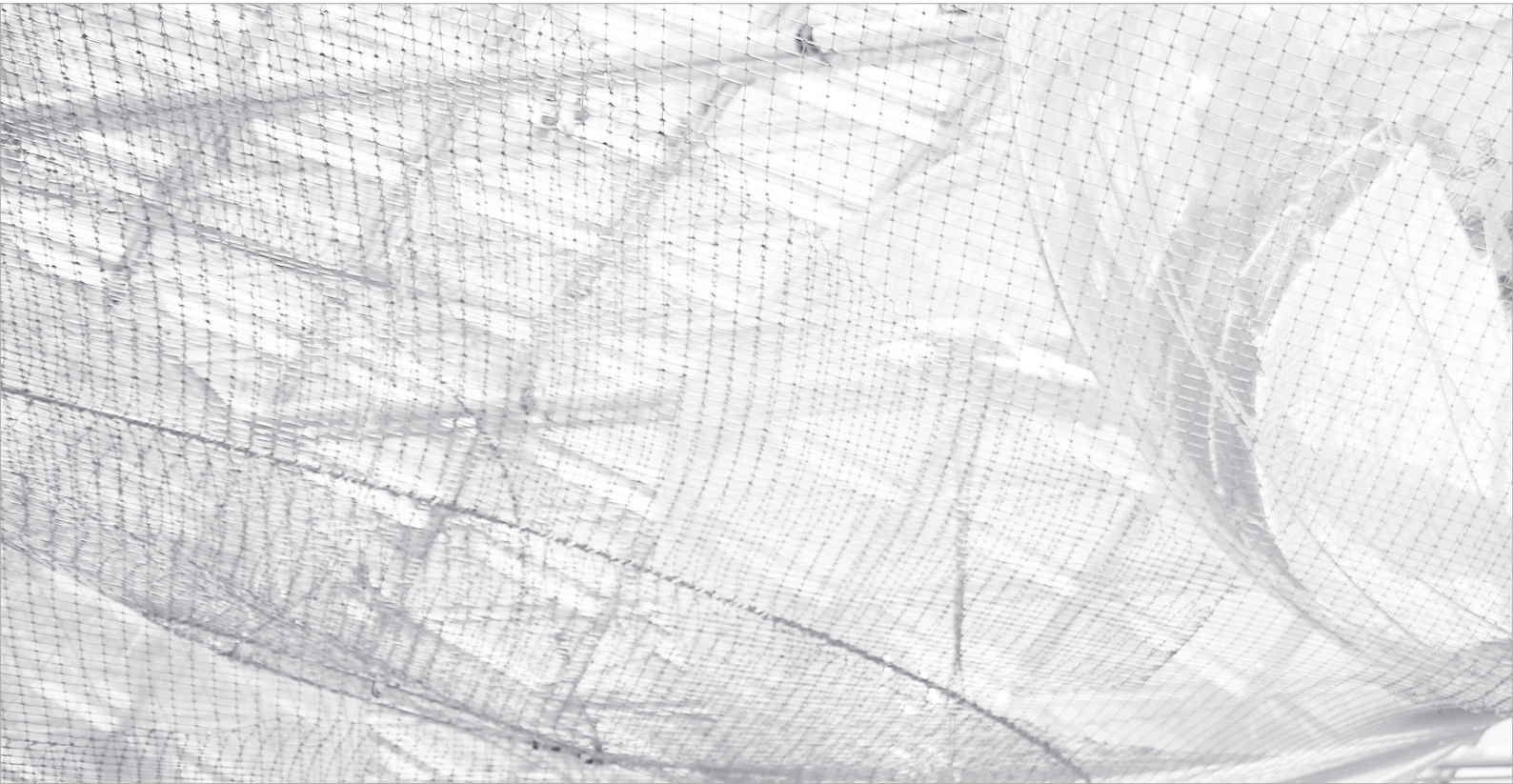




NEOSCHRONOS

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2014 INSIGHTS SERIES



2014 IN REVIEW

by Dr. Thomas Papanikolaou on May 1, 2015

It is my great pleasure to share these lines with you.

In 2014 Neos Chronos has expanded its reach, with assignments from existing and new clients. We are grateful for the trust and the recognition received for our work.

A boutique advisory services business like ours lives from the recommendations of its clients. We work hard to deliver on our client's objectives, not only because it is our professional commitment, but because it is our passion. We love making our customers successful.

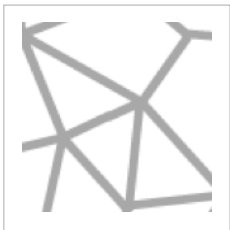
[Zig Ziglar](#) once said that "Repetition is the mother of learning, the father of action, which makes it the architect of accomplishment". To help all of us with revising (!) our in-house designers took everything we learned and created this Insights Series booklet. We are happy to share this with you.

If you were to read one article only, I recommend "The sky is not the limit". It is about near-space, inspiring school education and building the entrepreneurs of the future.

Enjoy reading!

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NET NEUTRALITY: PAST, PRESENT AND FUTURE.

by Dr. Thomas Papanikolaou on January 26, 2014

Net neutrality is the principle that Internet service providers and governments should treat all data on the Internet equally, not discriminating or charging differentially by user, content, site, platform, application, type of attached equipment, and modes of communication (source: [Wikipedia](#)).

Net neutrality proponents claim that telecom carriers seek to impose a tiered service model in order to control the data pipeline and thereby remove competition, create artificial scarcity, and oblige subscribers to buy their otherwise uncompetitive services (source: [Wikipedia](#)). Net neutrality opponents (the aforementioned telecom carriers) claim that the revenue earned from operating pure data pipelines (also known as bit pipes) is not sufficient to cover the investment required to build, maintain and expand their infrastructure.

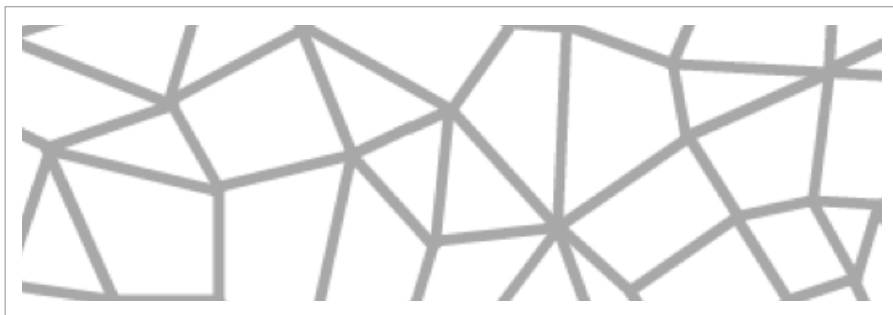
Net neutrality reappeared in the news recently, when the United States Court of Appeals for the District of Columbia struck down

the Federal Communications Commission's 2010 order that imposed [network neutrality regulations on wireline broadband services](#). The decision has been dubbed a [nightmare scenario](#) for several reasons, including that "carriers could charge different amounts for access to different tiers of the internet. The basic tier might include email and basic browsing; the next could include Facebook and Twitter; the final tier could include Netflix, YouTube, or Spotify. These tiers would be divided not by bandwidth or speed requirements, but by content type. The internet would become a club with various VIP sections, arbitrarily laid out to benefit internet providers'.

SIMPLIFYING COMPLEXITY

While figurative and vivid, extreme predictions and nightmare scenarios usually create an emotionally charged context that blurs the vision and hinders opinion forming. We will therefore focus on this article to explain net neutrality in simple terms using a real-world example that everyone can relate to: the mail parcel delivery service.

Delivering a parcel (with content) has, in a way, a lot to do with the way the Internet works and telecom carriers approach net neutrality. The metaphor provides the means to re-frame the discussion towards a less emotionally



COMPARISON	INTERNET ACCESS	MAIL PARCEL DELIVERY SERVICE	NOTES
CORE FUNCTIONALITY	transfers digital packets from sender A to recipient B.	transfers physical parcels from sender A to recipient B.	the core functionality is similar i.e. to handle transfer of data / content.
DIFFERENTIAL CHARGING	does not care about the monetary value of the content in the IP packets.	does care about the monetary value of the content in the parcels if the customer cares.	there is no discrimination by content value on the Internet, but there is discrimination by content value and mode of delivery in the carriers world if additional measures (equipment) are needed to implement it.
USER / SITE	does not care who A and B are, as long as they can be found.	does not care who A and B are, as long as they can be found.	No discrimination in either case.
CONTENT	does not care about the content of the IP packets.	does care about the content of the parcels (for customs / security reasons, etc.).	There are less constraints and rules on the Internet than there are in the regulated carriers world.
PLATFORM / EQUIPMENT	IP packets are delivered through a network of public nodes that route and deliver the IP packets in a best-effort manner from A to B.	parcels are delivered through a network of private logistics centres that route and deliver the parcels optimally from A to B.	Delivery through a carrier is delivery through a privately funded network, that is optimised to the carrier's business.
MODE OF COMMUNICATION	does not guarantee delivery to B. A has to retry if delivery does not work.	can guarantee delivery to B depending on the tariff charged. It can even pay penalties for non-delivery (insurance).	Carriers have to fulfil a minimum standard today due to legal regulations (e.g. emergency calls). Carriers say that delivery to B with a higher quality than the standard is a chargeable service.
BUSINESS MODEL	fees are charged to the users based on a combination of volume, time and speed, or as a flat rate.	fees are charged to the users based on combination of volume / weight, delivery speed, delivery warranty and value of content (for insurance purposes).	Carriers say that content like video overloads their infrastructure and they have to charge for delivery of such "heavy" content in order to be able to sustain network operation and expansion. They also want to charge for guaranteed (better than standard) bandwidth to access such content. The term used for this is Quality of Service. Net neutrality proponents say that differentiating charges based on the value of IP content / application is discriminatory.

charged context and allows to objectively present the argumentation of net neutrality proponents and opponents. The following table contrasts and compares Internet access and mail parcel delivery services and provides notes on how those relate to net neutrality and telecom carriers.

Based on the above, it seems the key issue lies in the disagreement of net neutrality opponents and proponents on who deserves to charge for content delivery. The answer to the question could define the future value chain positioning of the whole carrier industry segment. It is therefore no surprise that the approach to portray carriers as bit pipes has resulted in the strongest push back from the whole carrier industry and the recent court decision.

NAVIGATING THROUGH UNCERTAINTY

Even with net neutrality off the table (for now), carriers have a lot of work to do to secure the positioning in the value chain. For the sake of argument let's run through the day-after scenario:

Let's assume that a carrier decides to charge differently based on the content delivered over its network. It is unlikely that this carrier would do so by **dividing the Internet in tiers** and charging users differently based on the content they access. The reason is that in the current competitive environment, the first carrier to do so would see its users migrating in masses to its competition. Content providers like Netflix have already stated that they would actively motivate users to **defend the open internet** in case a carrier would go down this route. Thanks to regulations against cartel-building, it is also unlikely that carriers could orchestrate such an action.

What is more likely to happen is that a carrier will start advertising differentiated business models. For example, while everyone will still be able to access Youtube, if YouTube wants its users to watch higher quality or longer videos, YouTube will most likely consider paying the carrier for delivering those videos without eating on the users data package. AT&T has recently created such a **sponsored data offering**.

Contrary to what is claimed, sponsored data offerings are neither anti-competitive, nor do they stifle innovation for those who cannot afford to pay. If that would be the case, then the whole advertising industry neutrality would need to be revisited as well, as those who can pay, get a disproportionate amount of eye balls, click-through visits etc. If advertising does not stifle innovation, neither do sponsored data offerings.

In summary:

- For now the net neutrality discussion continues.
- We believe net neutrality proponents were not successful because they ignored the needs of other players in the value chain and thus received the strongest push back that the survival instincts of carriers could produce.
- Net neutrality opponents have no reason to celebrate: In the current competitive environment, it is highly likely that the first carrier to try and charge users based on content will face an immediate backlash from users. Carriers therefore need to devise a way to demonstrate there

is commercial value for a content provider in offering its users an easier and simpler route to content. Carriers need a credible first mover from the content space to validate this assumption (like **ESPN** in the US).

• If the current decision on net neutrality were to be upheld, the future without net neutrality could include subsidised Internet access for everyone. We already live in a world where everyone enjoys advertising-funded Internet content and services (YouTube, Facebook, Google Search, Gmail, ...), so the step towards subsidised internet access is smaller than many are willing to publicly acknowledge. In fact, sponsored data offerings are nothing more than another way to advertise content.

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Wikipedia: **Net neutrality**.

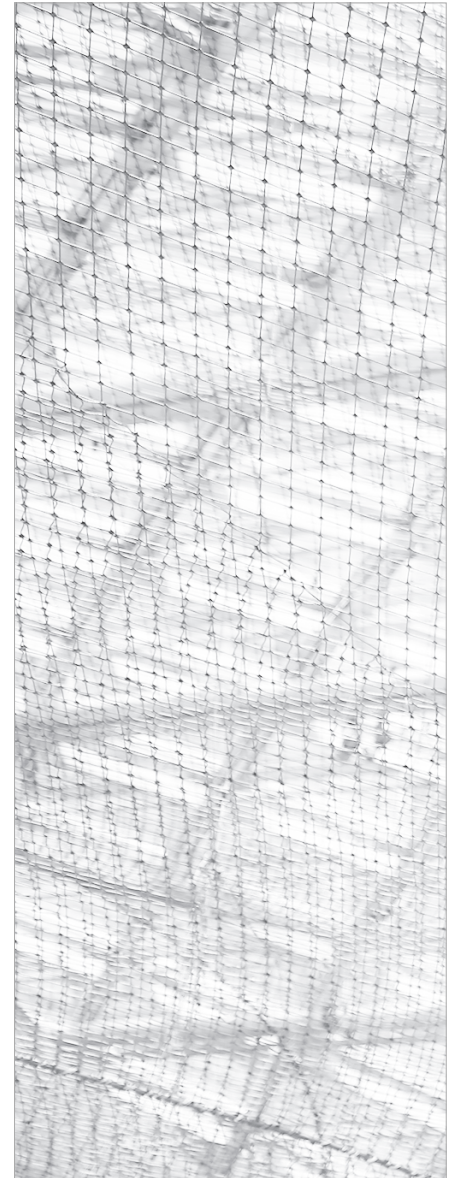
The Guardian: **Appeals court rules against FCC's right to protect 'net neutrality'**.

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Los Angeles Times: **Will Netflix be the savior of net neutrality? Or a fifth column?**

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THE OPPORTUNITY BEHIND DATA AS A CORE BUSINESS.

by Dr. Thomas Papanikolaou on March 19, 2014

At this year's Mobile World Congress **Tele2's** CEO **Mats Granryd** announced his company's move to all-data, bucket mobile plans for its consumers. Under this model Tele2 will give away all of the voice minutes and text messages consumers use and charge only for data. Tele2 has already started implementing the new plans in some of the countries it operates "gearing the company up to be solely dependent on data". In other words, establishing data as a core business for Tele2.

The **strategic** and business case considerations behind this move can seem dazzling. For a long time, and still today, many mobile operators have regarded the introduction of all-data mobile plans as the acknowledgment of being a bit-pipe. The latter comes with the associated fear of extinction of the high-profitability revenue sources: voice minutes and texts.

THE IMPACT OF DATA ON THE VOICE AND MESSAGING BUSINESS MODELS

To illustrate the theoretical impact on profitability an all-data model can have on a mobile operator's business, we will use the **Pay-As-You-Go (PAYG)** mobile plan from **Three UK** as a reference. Three UK charges PAYG customers 3p/min, 2p/text, 1p/MB, where p stands for pence, currency is Pound Sterling and £1 = 100p. Transforming that pricing structure simplistically to an all-data model means the user pays only for data (at 1p / MB) with voice minutes and text messages being deducted from the available data volume like Internet browsing traffic.

Let us look at the theoretical impact, noting that 1MB equals to $1024 \times 1024 = 1,048,576$ bytes:

- Voice: good quality voice calls (e.g. using **Adaptive Multi-Rate (AMR)** as an audio Codec) consume 12.2 kilobits / second = 1525 bytes / second. At that rate, 1p / MB would suffice for 11.5 minutes of calling, which would otherwise cost 34.5p.

- Messaging: 1MB is equivalent to 6,553 texts (at 160 characters or bytes per text). This means that for 1p one could send 6,553 texts, which would otherwise cost £131! No wonder Over-The-Top (OTT) messaging apps have seen such growth with cost-conscious consumers.

It is worth highlighting that operators implementing bucket plans often increase the price of bucket data to recover the loss of voice minutes and messaging texts. Therefore the actual impact might not be as dramatic as shown in the short-term.

DATA AS A CORE BUSINESS: KEY INSIGHTS

Over the long-term, all-data mobile plans invalidate the existing messaging pricing models and put enormous pressure on the existing voice pricing models. So where is the opportunity in this context? What insights could be possibly driving a mobile operator's decision (e.g. Tele2) towards all-data mobile plans and data as a core business?

- **USER BEHAVIOUR IS CHANGING**

Tele2 hints at consumers moving away from PAYG plans towards bucket plans. In such plans, a bucket allowance is provided which can be used across many devices, reflecting the new usage pattern that has emerged because users either own multiple devices and / or share data with family members. The pattern has been successfully validated in the US since 2012 by [AT&T](#) and [Verizon](#).

- **INTERNET AND MOBILE VIDEO USAGE INCREASES FASTER THAN MANY ANTICIPATED**

Consumer communications and brand engagements are more and more taking place over the Internet. The traffic generated by [Facebook](#), [YouTube](#), [Instagram](#), [Vine](#), [WhatsApp](#), [Viber](#), [WeChat](#), ... and other existing or yet-to-be-invented [OTT](#) applications increases continuously, and often in an exponential manner. Such increased data usage is monetisable traffic in an all-data model. Granryd

hints “the trick is to realise how much data consumers use and to move them up the bucket chain”.

- **THE COST OF IMPLEMENTING ALL-DATA PLANS IS REASONABLY PREDICTABLE**

With consumer communications are more and more taking place over the Internet and new traffic generated being “data” rather than legacy voice and messaging, it is reasonable to assume that existing, already amortised investments in voice and messaging infrastructure do not need to be expanded to cover increased person-to-person usage. Therefore, the legacy cost side when moving to all-data mobile plans is reasonably predictable.

- **A DATA-CENTRIC APPROACH TO MOBILE PLANS CAN ENABLE A BETTER USER EXPERIENCE**

All-data mobile plans have the potential for simplicity, if implemented consistently. For example, one counter is enough to show a user how much data allowance remains, and one simple click is enough to buy more

data when needed. Bucket data plans are also ideal for small enterprises, offering cost predictability and simplicity.

DATA AS A CORE BUSINESS: NEAR- AND MID-TERM GROWTH OPPORTUNITIES

Even with those insights moving towards a “data as a core business” future represents a major transformation for any operator. We believe that such a future is full of opportunities, and luckily a number of inspiring examples exist that show where these opportunities can be found:

- **E-COMMERCE SPONSORED ACCESS**

[Amazon Kindle](#) provides (beside heavily subsidised hardware) also free mobile access to its content (in the UK via a Data MVNO agreement with Vodafone). With more and more [vertically integrated ecosystems](#), this could be the first of many examples to come.

- BRAND / ADVERTISING SPONSORED DATA

Netzclub is an advertising-financed mobile phone tariff run by **Telefonica** Germany. In addition, the Spain-based operator is trialling a “sponsored calls” service in Brazil, which allows Vivo pre-pay customers to make a free phone call after listening to a short audio advert. We can reasonably expect to continue to grow, with **Big Data and Analytics** providing the intelligence for more targeted offers.

- HARDWARE BUNDLED DATA

Datawind (UbiSlate) (via Vodafone) and **HP DataPass** (via Fogg Mobile) are MVNOs with bundled offerings of free mobile broadband together with their hardware offering. Car manufacturers like Audi and Volkswagen embed high-speed mobile access in their new models to offer on-board infotainment. In the **Internet of Things (IoT) / Machine-To-Machine (M2M)** context we expect to see innumerable use cases that drive data growth.

- OTT DRIVEN DATA TRAFFIC

WhatsApp became recently an MVNO on E-Plus in Germany. With a global user base of 450m subscribers (30m of those in Germany) WhatsApp is bigger than E-Plus, thus creating monetisable data traffic for E-Plus. **MTV Mobile** in Switzerland offers WhatsApp in its **tariffs**, zero-rates all WhatsApp traffic within the country but charges data traffic while roaming. More critically though, partnering with OTTs represents a unique and strategic growth opportunity for any operator to benefit from increased data usage and access to new users beyond their own subscriber base.

- EMBEDDED VOICE OVER IP AND MESSAGING OVER IP

In an all-data world and with the broad deployment of technologies like Web **Real-Time Communications (WebRTC)** voice and messaging rapidly become building blocks of the Web. Companies like **Tropo** and **Twilio** show already how voice over IP and messaging over IP can be embedded into enterprise workflows and everyday consumer

scenarios as programmable software components.

In summary:

- All-data mobiles plans are a first step in long transformation journey, seeing operators moving towards data as a core business. This is a natural evolution driven by a fundamental change in user behaviour as the Internet becomes intertwined with our lives. In the long-term, they invalidate the messaging business model as we know it and put pressure on the voice business model.
- Mobile operators have all reasons to be upbeat. They can directly benefit from the increased Internet data traffic and from voice and messaging becoming embedded building blocks into enterprise workflows and everyday scenarios. Indirectly, operators can also benefit from the new business models introduced by other value chain players e.g. data MVNOs, with further examples waiting to be uncovered in M2M and the Internet of Things context.

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Tele2: [Website](#), [Mats Granryd](#).

AT&T: [Mobile Share © Value Plan](#)

Telefonica: [Website](#)

Verizon: [The Everything Plan](#).

Three UK: [Website](#), [Pay-As-You-Go Price Plans](#).

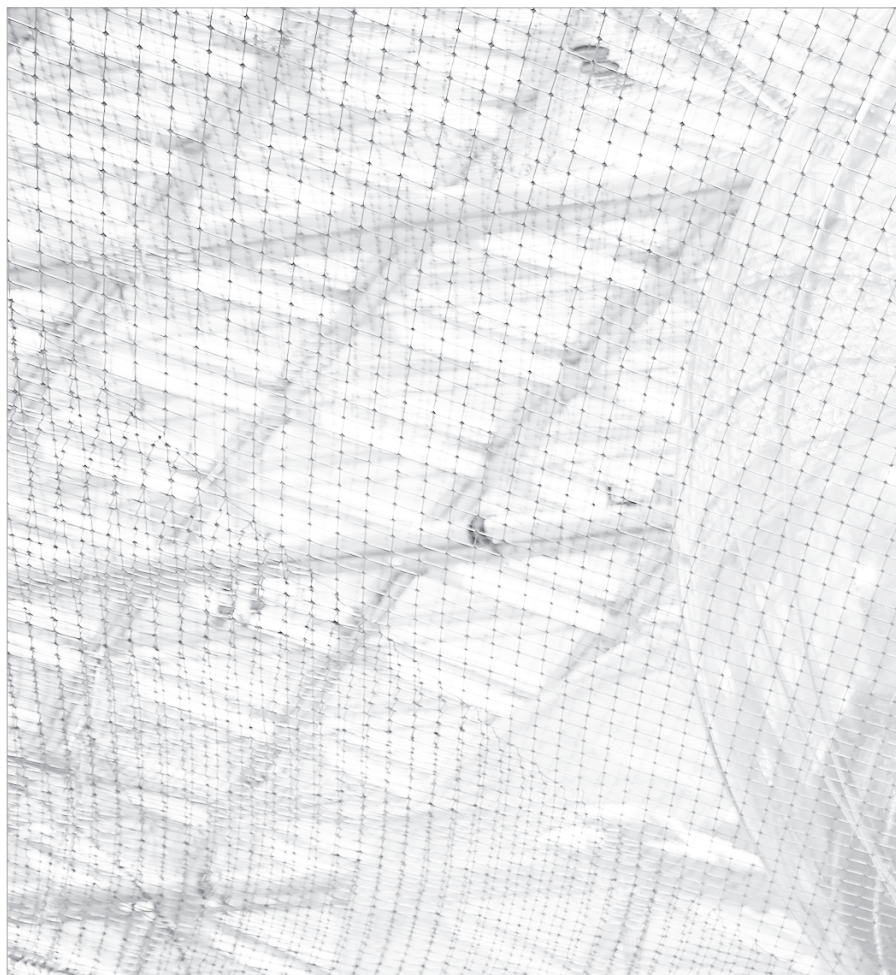
Wikipedia: [Adaptive Multi-Rate \(AMR\) audio Codec](#), [Mobile Virtual Network Operator \(MVNO\)](#), [Internet of Things \(IoT\)](#), [Machine-To-Machine \(M2M\)](#), [Web Real-Time Communications \(WebRTC\)](#).

Data MVNOs: [Amazon Kindle](#), [Netzclub \(in German\)](#), [Datawind \(UbiSlate\)](#), [HP DataPass](#).

OTT: [Facebook](#), [YouTube](#), [Instagram](#), [Vine](#), [WhatsApp](#), [Viber](#), [WeChat](#).

MTV Mobile: [Website \(in German\)](#), [WhatsApp tariffs \(in German\)](#).

Voice and Messaging as Web enablers: [Tropo](#), [Twilio](#).





HOW MASS-MARKET SERVICES DEGENERATE TO COMMODITIES.

by Dr. Thomas Papanikolaou on May 25, 2014

Looking back in history, and with the benefit of hindsight, it is relatively easy to see why the telecommunications industry has been pushed to accept a commodity role. In fact, one can argue that the context telecommunication companies (Telcos) have been operating within, made it inevitable that telecommunications would be forced downwards to a commoditised position in the value chain.

Anecdotically, some will say the reason for commoditisation were the Internet players, who took a free ride on the expensively-built telecommunications infrastructures, offering similar services “for free”. Others will claim that telecommunication providers have been over-protective of, and have excessively monetised communications: a resource that should be equally available to everyone (a

discussion closely related to [Net Neutrality](#))

The actual reason is, uncharacteristically, not somewhere in between. Let us explain this, by contrasting and comparing telecommunications operators, to [Google](#) and [Facebook](#). The comparison easily extends to [Twitter](#) and the [Internet of Things \(IoT\)](#), but for the sake of simplicity we will use Google and Facebook.

	TELCO	GOOGLE	FACEBOOK
LARGE SCALE INFRASTRUCTURE	yes	yes	yes
MASS-MARKET SERVICE	yes	yes	yes
SERVES A BASIC NEED	communication and connectivity	information access and communication	social networking and communication
SELLS	data	analytics data	relationships data
CHARGES ON VOLUME	number of megabytes	number of impressions	number of impressions
BUSINESS MODEL BEST CASE	client always uses less than they paid for	everyone/thing is searchable	every private info has been shared
REGULATED	yes	no	no

What the above table illustrates is that Telcos, Google and Facebook are not as different to each other as they would like to portray themselves. Telcos, Google and Facebook are all in mass-market, volume-type of business. Telcos represent Web 1.0 and Google and Facebook Web 2.0 (see [Walled Garden 2.0](#)). If there are any conclusions to draw from this type of comparison those are:

- Google and Facebook are extending into communications i.e. aim to serve the basic need Telcos have been serving up to now (see for example Facebook's [WhatsApp acquisition](#)). Telcos, on the other hand, try to extend into connectivity and, more and more, [analytics and big data](#).
- Google and Facebook are not regulated to the (extreme) extent Telcos are.

With extended market reach (billions of users), Google and Facebook should, however, expect increased scrutiny from the regulator. This is already happening and several policy-driven regulatory actions around privacy exist, the

latest being Google being forced by the European Union to [amend links to information on request](#). Also recently, Facebook had to respond to calls for [changes in its default privacy settings](#) that put users at risk of accidentally over-sharing content.

How far such regulatory action can and will go in the future depends on several factors. However, as Google and Facebook get nearer to becoming synonyms for “being able to find information” and “being able to connect socially”, they approach a de facto monopoly status that has historically raised regulatory interest. In particular in the US.

One could claim that, unlike Telcos who charge for communication, Google and Facebook do not charge for information access and social networking. How can something that is provided “for free” be a monopoly or be further commoditised? The answer is that the commoditisation we are referring to is not one of price. It is one of Google and Facebook services becoming synonymous to “having electricity” or “having run-

ning water”. It is about their services becoming so fundamental (as in human rights), that Google and Facebook will have to start complying with Net Neutrality 2.0. “Net” being here Google and Facebook infrastructure, data centers, core services, offering “neutrality” towards new, Web 3.0 Over-The-Top players. Think Google and Facebook evolving to bit-pipes for Web 3.0 companies.

Ironically, Google and Facebook extending into communication only accelerates the broader adoption of their services as basic needs and their future as a bit-pipe for Web 3.0. The more voice, video, messaging and free internet access Google and Facebook offer, the more similar they become to total communication providers, and the faster they lose service differentiation. With a demographic evolution that sees digital technology reaching out to a younger generation of users (e.g. school kids) this process will only speed up.

In summary, serving a basic need successfully for a mass-market is a sure road to becoming

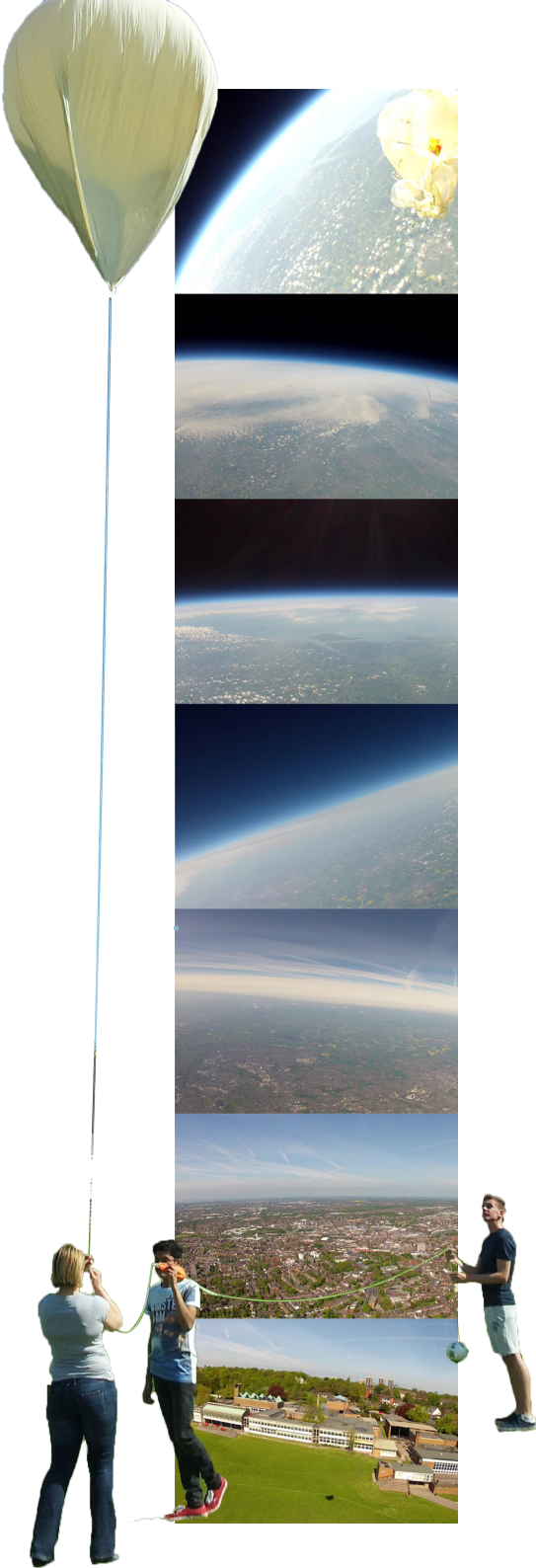


ing a commodity. Regulation takes care of that. This is not good or bad. It is natural evolution.

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The Guardian: [EU court backs 'right to be forgotten': Google must amend results on request](#) .
The Guardian: [Facebook bows to pressure on privacy settings for new users](#) .
Google: [Google website](#).
Facebook: [Facebook website](#), [WhatsApp acquisition](#).
Twitter: [Twitter website](#).
Wikipedia: [Internet of Things \(IoT\)](#), [Machine-To-Machine \(M2M\)](#).



THE SKY IS NOT THE LIMIT.

by Dr. Thomas Papanikolaou on July 4, 2014

Project Horizon was founded at **Queen Mary's Grammar School**, Walsall, in February 2012. To the best of the school's and our knowledge it is the only school in the country with an active **Near Space** Programme. Horizon aims to raise the profile of Science, Technology, Engineering and Mathematics in both the school and the local area. As well as being an unforgettable experience for the pupils, the project helps foster links with local and national institutions and businesses, inspiring pupils and broadening their aspirations.

Neos Chronos became aware of Horizon in the beginning of 2014, as we were approached to help support the three planned missions: Gagarin, Armstrong and Hadfield (next and final launch), all named by the pupils after astronauts who, in their own way, have defined space history.

The proposition was quite unbelievable at first: using **weather balloons**, Horizon would fly probes far beyond the breathable atmos-

phere of the Troposphere and out into the blackness of the **Stratosphere**. The probes would carry a payload of cameras and sensors, broadcasting their position above the country and recording their environment throughout the flight. They would explore areas of the atmosphere that most people will never travel to in their lifetimes. All planned and executed by a team of pupils who would build the systems, contact sponsors, design the probes, monitor the weather forecasts, predict and prevent potential problems before they occur, plan the publicity campaign, plan the launches, present the videos, program the computers, raise funds, (re)design the **website**, run the **Twitter account**, setup the live feed on launch days, take the photos, test the equipment, track the probes and give chase.

The challenges seemed enormous. The probes would go beyond the blue skies and the familiar, to a place of extreme conditions: violent jet streams, temperatures low enough to freeze

water in a split-second, cosmic radiation a hundred times that experienced on the surface of the planet. Then the trip down; plunging at **terminal velocity** until the probes hit the breathable atmosphere. The number of things that could go wrong was astronomical.

And then the surprise: the school **did this before**, successfully. All of this on a shoe-string budget, with equipment bought from companies accessible to the general public, with software developed as open source and code to be made publicly available in the near future. All of a sudden, the 2014 tough goal to beat the height achieved by **Felix Baumgartner** and the **Redbull Stratos** project seemed achievable. The succinctly abbreviated Twitter tag **#beatfelix** started to make sense.

Joining the list of Horizon sponsors was, nevertheless, not a decision based on the probability of success. For us at **Neos Chronos**, Horizon represented and represents an inspiring endeavour, and a remarkable example of what can be done when the right team,

with passion, determination, and ingenuity comes together. A team that is bold enough and capable to turn an idea into reality, rally support around it, and ultimately achieve their aspirations. Be it now, or, if the team were not to be successful this time, in the future.

If all this sounds familiar, it is because these are the ingredients of any successful team that applies the lean startup methodology to build a business. With Horizon, **Queen Mary's Grammar School** is nurturing the entrepreneurs of the future.

We are therefore both proud and delighted to be one of the Project Horizon sponsors, providing funding for the telecommunications and equipment, as well as supporting the project in social media.

The final probe, Hadfield, is set to launch on launch 10am, Saturday 5th July 2014 (weather permitting) with reserve dates on Sunday 6th July, Saturday 12th July and Sunday 13th July 2014. You can check for the exact date and updates on the Horizon **twitter ac-**

count and the Horizon **website**. Experience for yourself that the sky is not the limit.

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Project Horizon: **website**, **twitter account**, **Queen Mary's Grammar School**

Redbull Stratos: **website**
 Wikipedia: **near space**, **weather balloons**, **stratosphere**, **terminal velocity**, **Felix Baumgartner**





A PRIMER TO BUSINESS INFORMATION SECURITY.

by Dr. Thomas Papanikolaou on August 18, 2014

In a world where customer information and enterprise networks are under constant attack, owning and processing personal and business information requires particular attention to information security. In the case of personal information this is mandatory due to data protection legislation, in the case of business information this is critical to secure competitive advantage.

According to the [ISO 27001:2013](#) standard, Information Security, sometimes shortened to InfoSec, is the practice of defending business information from unauthorized access, use, disclosure, disruption, modification, perusal, inspection, recording or destruction. It is a general term that can be used regardless of the form the data may take (electronic, physical, etc.)

In practical terms, business owners need to be aware of the following 8 key information security goals when building, evaluating, reviewing or updating their business information systems:

- **ACCOUNTABILITY**

The ability to hold someone personally accountable and responsible for their actions e.g. protection of an asset or set of assets. The emphasis here is on the 'someone' and the 'personally accountable'.

- **AUDITABILITY**

The ability of a system to conduct persistent, non-bypassable monitoring of all actions performed by humans or machines within the system. This component has thus two parts, firstly that any position that a system is found in should be able to be backtracked to determine how it got into that state and secondly, that an ongoing process of management review or audit should be undertaken to ensure that the systems meet all documented requirements. For example, ISO-certified document retrieval and storage systems offering access and version control can help meet this requirement. Auditability and Accountability are particularly important for publicly traded businesses which have

to be compliant with the [Sarbanes-Oxley Act](#), [HIPAA](#) or [SEC](#).

- **AUTHENTICITY & TRUSTWORTHINESS**

The ability of a system to verify identity and establish trust in a third party and in information it provides.

- **AVAILABILITY**

Assurance that the systems responsible for delivering, storing and processing information are accessible when needed, by those who are authorised to use them. Hereby it is important to consider that when cloud systems and services are used to ensure availability, attention needs to be paid to the [European Data Protection Directive](#) and the [International Safe Harbor Privacy Principles](#).

- **CONFIDENTIALITY**

Assurance that information is shared only among authorised persons or organisations. Breaches of confidentiality can occur when data is not handled in a manner appropriate to safe-

guard the confidentiality of the information concerned. Such disclosure can take place by word of mouth, by printing, copying, e-mailing or creating documents and other data etc.; Hereby letting employees, partners, and customers sign a **Non-Disclosure Agreement** shall be seen as the minimal action. Far more important is establishing clarity among parties on what constitutes confidential information, and an organisational culture that values confidentiality.

• INTEGRITY

A system should ensure completeness, accuracy and absence of unauthorised modifications in all its components. Assurance that the information is authentic and complete. Ensuring that information can be relied upon to be sufficiently accurate for its purpose. The term 'integrity' is used frequently when considering information security as it represents one of the primary indicators of information security (or lack of it). The integrity of data is not only whether the data is correct, but whether it can be trusted and relied upon;

Accountability, Auditability and Availability (as explained before) are key enablers to achieve Integrity.

• NON-REPUDIATION

The ability of a system to prove (with legal validity) occurrence / non-occurrence of an event or participation / non-participation of a party in an event.

• PRIVACY

A system should obey privacy legislation and it should enable individuals to control, where feasible, their personal information (user-involvement). Here again, attention needs to be paid to the **European Data Protection Directive** and the **International Safe Harbor Privacy Principles**.

For example, assuming a user never reveals his / her digital certificate (Confidentiality), and that e-commerce systems employ strong cryptographic algorithms for access control (Authenticity & Trustworthiness, Accountability, Auditability) towards highly-Available backend-systems that are designed to assure Privacy and Integrity, it is possible to implement

secure e-commerce transactions that fulfill the Non-Repudiation principle.

In summary:

- By employing the information security principles of Accountability, Auditability, Authenticity & Trustworthiness, Availability, Confidentiality, Integrity, Non-repudiation and Privacy, a business can reliably secure customer data, business information and assure legally compliant operation.

CREDITS & REFERENCES

Please observe the Neos Chronos **Terms of Use**.

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 Wikipedia: **ISO 27001:2013, Sarbanes-Oxley Act, HIPAA, SEC, European Data Protection Directive, International Safe Harbor Privacy Principles, Non-Disclosure Agreement**



HOW CLOUD SERVICES IMPACT IT EXECUTIVES.

by Dr. Jeannot Muller on October 14, 2014

There is a lively ongoing discussion about the approach, the timing and speed of introduction of **cloud services** into the enterprise workflows. When asked by their business stakeholders, you often hear IT executives state that “the cloud is expensive”, “the cloud is insecure”, “the cloud doesn’t fit to our business model” ... These statements fail to appreciate a fundamental paradigm shift. The cloud is now! It is not about if you will move to the cloud but when.

MANAGING CHANGE

If we could look into the heads of the same executives, their thoughts would paint a picture full of challenges:

- “After the depreciation of our in-house hardware, we will have to renew everything which will be expensive. As hardware becomes smaller, our data center will by then be too big also”.
- “We outsourced a lot in the past, as I can’t compete with my teams against the subject matter experts in service com-

panies. As we outsourced telecoms, I can’t guarantee that we have full control of security today. There are services for encryption which we could use to protect you, but we have no idea how to do so”.

- “The more you are going for external services, the more expensive my team will look like. The more you will like external services, the more you will hate our own implementations, lack of integration into public services and speed of innovation”.
- “My team can’t compete with the update cycles of specific services, nor can we offer the mobile experience you do like so much at the same cost”.
- “Lots of people, including myself, will lose our jobs, as you - the business - will run your services by yourself in the future. Or I will lose my influence, as no one will understand the problems I have to deal with”.

The cloud is redefining the cost base, delivery approach and structure of the IT organization.

MEETING NEW EXPECTATIONS

IT customers (aka the end-users) are neither interested in these challenges of current IT, nor are they interested in the “cloud” itself. They are solely seeing the “service” and the “ease” of getting these services up and running.

Let’s take a smartphone as an example. The first versions required the installation of a piece of software on your desktop or laptop for a simple activation. This implied all kinds of typical IT challenges: perhaps the user had downloaded the wrong version for the specific operating system, or didn’t have enough space on the hard drive, or changed USB ports ... With the latest version of smartphones, a simple registration during the installation process with your supplier is sufficient. All done, all up and running in a few minutes, with no or very little need to call for support.

It is exactly this seamless and hassle-free “service experience” which makes a happy customer

and disconnects the end-user from his own IT people who do not provide a similar experience.

It is not about the “cloud”, it is all about “services”.

BALANCING CUSTOMIZATION VERSUS STANDARDIZATION

For decades IT departments did a fantastic job in convincing their business about the need of customization. Indeed, there are areas where customization makes sense, either from a competition point of view, or because of the nature of the process. Production is one example. Your machines are probably very specific and consequently they do need specific IT solutions.

However, Finance, HR, Marketing, Communication, Telecoms, Collaboration - you name it - are standardized services which can easily be covered by commodity services delivered in the cloud. Why should an order-to-cash, or a purchase-to-pay process be customized? Each penny invested into customization of such services is a pure loss of cash and does not

help in making a company more competitive.

REINVENTING THE ROLE OF IT

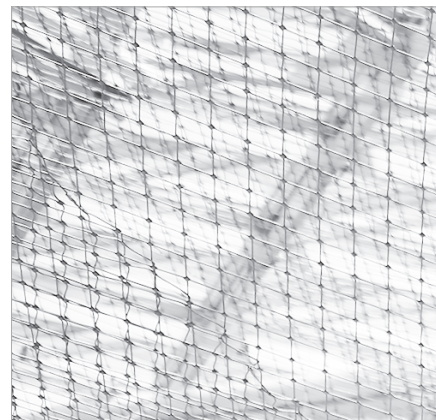
The best place to show the impact of the cloud on IT is most probably the area of license management. For years suppliers and internal IT departments tried to fight this battle from both sides. “How many licenses are used” versus “How many and what type of licenses are really needed”. The cloud re-frames this discussion dramatically, as actual consumption of value-add services is what a business pays for, not licenses. This is a fundamental change to yesterday’s way of doing business and redefines the role of IT personnel (the IT license managers in our example).

The impact goes though beyond plain role redefinition. Today the business needs experts to help them choose the right services and to ensure seamless integration and security. The **strategic** roadmap is driven by the business, not IT. The executives helping the business will be enablers to the business, but the business itself

will become the “officer” of “information”.

These support functions will see new jobs like “Chief Service Orchestrator”, “Chief Service Integrator”, “Chief Service Securer” ... but all these jobs will be very different from all the current IT positions and they will need a very small overhead of technical experts.

Intelligent executives are aware of this evolution, they are embracing change and they are helping their business on their path to leave classic IT. It is not about “if” this change will happen, it’s about “when” it will happen for your business.





THE AUTHOR

Dr. Jeannot Muller has over 20 years broad experience in IT. He has worked in different executive management positions with Deutsche Post DHL Global Business Services since 2006 on both sides of Business IT and IT Supply. Prior to his engagement with Deutsche Post DHL

Dr. Jeannot Muller was employed by CIBER, where he was part of the management team and responsible for project management in various global IT projects for international customers.

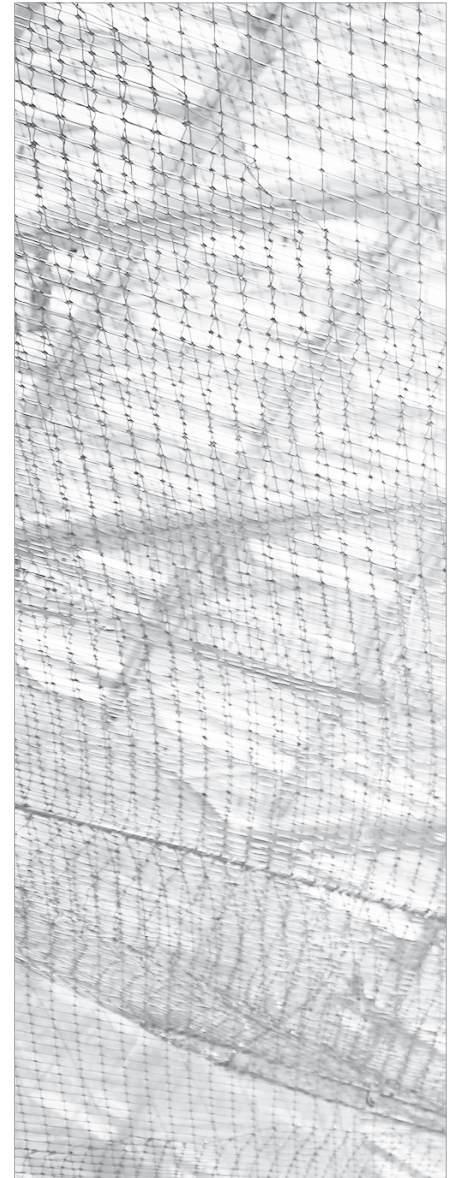
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Webopedia: [cloud services](#)

Wikipedia: [The Cloud, Cloud Computing](#)





WI-FI CALLING MARKET OVERVIEW.

by Dr. Thomas Papanikolaou on October 24, 2014

Wi-Fi Calling is the commercial name for a telecommunication technology that allows to seamlessly place and receive calls over Wi-Fi in areas where there is no mobile coverage. Seamless means that you still use your actual phone number: the person you call, or you receive a call from, will never know.

Implementations of Wi-Fi Calling consist of either native or downloaded / OTT applications on your device connecting to a carrier's network via **Unlicensed Mobile Access (UMA)**, the commercial name for **Generic Access Network (GAN)**. GAN is a telecommunications system that allows voice, data and multimedia from your phone to be transferred to your carrier over the Internet, and enter the carrier's core network as if they had been beamed over the air. While GAN-based Wi-Fi Calling implementations are still in operation, a more recent alternative utilises an **Evolved Packet Data Gateway (ePDG)** within LTE's **Evolved Packet Core (EPC)**.

T-Mobile USA pioneered Wi-Fi calling in 2007 in a bid to improve user experience in areas lacking mobile network coverage. The ability to seamlessly place calls and send texts over Wi-Fi and the increasing Wi-Fi coverage has subsequently resulted in a new breed of "Wi-Fi first" carriers. Such carriers offer(ed) dramatically different price points, as long as subscribers would agree to remain in Wi-Fi coverage and use the mobile network as a fallback.

Naturally, not all Wi-Fi calling implementations are the same. We already mentioned that some devices have Wi-Fi calling pre-integrated and other devices require the installation of an application. There are also differences in mobility handling (the ability to move from Wi-Fi to the mobile data network and vice versa while on a call) with some carriers opting for automatic handover and others preferring the user to actively decide by pressing a soft-button. Finally, some carriers are using vertical implementations in the core network, where others prefer to

wait until they can deploy a **VoLTE**-based architecture.

TABLE OF CONTENTS

The Wi-Fi Calling market overview contains information on all aspects discussed in this article. Here is the list of carriers in the overview:

- Canada: Rogers Communications, Fido
- USA: AT&T, Republic Wireless, Scratch Wireless, TextNow, T-Mobile, Metro PCS, Verizon
- UK: British Telecom, Everything Everywhere, TalkTalk, Three, Virgin Media
- Global: Telefonica, Vodafone
- Other: Smartone

The overview is delivered as a table, with the carriers listed on the first column, and information on their offering one a per-line basis. Information includes the Service name, the Type (Native/Download), available Devices, Mobility (automatic handover between WiFi and 3G/4G), end-user Costs, Statistics on market reach and useful Links for further reading.

DOWNLOAD INSTRUCTIONS

If you have not joined our newsletter yet, please follow the instructions in the **SUBSCRIBE & DOWNLOAD** section. The download link to the Wi-Fi calling market overview will be provided to you together with your subscription confirmation. In addition, you will also get access to the Neos Chronos 2013 Insights Series booklet.

If you are an existing subscriber, or do not want to join our mailing list, you can get access to the Wi-Fi calling market overview by following the instructions under the **DOWNLOAD ONLY** section.

Finally, if neither method is suitable, please **contact us** directly. We will be glad to help.

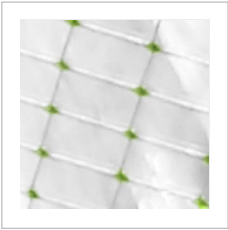
Enjoy reading!

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Wikipedia: **System Architecture Evolution**, **LTE**, **Generic Access Network (GAN)**, **Unlicensed Mobile Access (UMA)**, **Voice-over-LTE (VoLTE)**





HOW ITUNES COULD DISRUPT MOBILE DEVICE MANAGEMENT.

by Dr. Thomas Papanikolaou on December 15, 2014

Realistic fiction scenarios is a method we use in [strategy](#) development to inspire new thinking. The approach is fairly simple and thus highly effective: based on technologically and practically feasible assumptions, we employ fictional scenarios to synthesize future use cases. These use cases are then used to highlight and motivate what a business need to do in a specific version of the future to retain market control and / or become more competitive.

Here is one example:

Tim opened iTunes on his MacBook, clicked on "Account" and pressed the "Connect" button. It was Tim's first day at work, and he was eager to get going. He entered his employer's name, followed by the unique personal code Human Resources had given him. His iPhone vibrated, requesting him to authenticate with his [fingerprint](#), which he did. Tim thought iTunes for Enterprise was awesome since the first time he used it. It would now only take a few seconds, and iTunes would

make sure his mobile number would be [ported](#) to his employer's mobile network provider (they paid the bill!), his [SIM](#) populated with his employer's enterprise CRM and WiFi settings, and his phone, iPad and Macbook would get the latest enterprise apps from his employer's secure app-store. Moments later, an [iMessage](#) arrived to confirm all went well. Being a senior manager, he was informed he could use [Apple Pay](#) to pay for work expenses from his assigned OPEX, and those expenses would be automatically managed. He sent the first email from his new account to his boss saying he was ready to go. He had to smile.

Step by step, Apple had removed all complexity associated with enterprise IT and communications and it seemed no one, of those who should have, noticed the potential impact until it was too late. Surely, the first Apple attempts were clunky: iMessage was initially not able to deliver the cross-device experience it was supposed to - Tim even stopped

using it for a while. Apple fixed it though, and went a step further, by syncing SMS and iMessages and allowing conversations to continue across devices. [Facetime](#), Apple's first attempt to use WiFi for a compelling video calling experience, did much better and delivered where network providers had failed. Around 2015, with [WiFi Calling](#) and the [Continuity](#) feature, Apple then delivered seamless hand-over of communications across networks and devices.

It was this simplified communications experience that Tim cherished - he paid a lot to own Apple products and felt rewarded for his loyalty when they made his life easier. The stroke of a genius, or so Tim thought, was the introduction of the [Apple SIM](#), which made it possible to switch network providers in the same way the first iPhones used to be activated in iTunes: connect the phone, activate your favorite network operator, done. While Blackberry tried to offer multiple identities on the same SIM by introducing additional network technology and com-

plexity, Apple promoted a single, **embedded SIM** with downloadable network profiles that could be rapidly switched e.g. to get local rates when traveling to a foreign country. By 2020 the Software-SIM era was a reality and Tim loved listening to Apple's new Chief Designer explaining how Apple pushed the industry towards a software SIM because "fiddling with small pieces of plastic was not acceptable user experience" and arguing that the space saving within Apple devices was "remarkable" and now used in a "so much more productive way". Listening to her speaking reminded everyone of Sir Johnathan Ive, who had left Apple for NASA to design the first spaceship that would bring **humans to Mars**.

With all that in place, and with hindsight, iTunes was destined to become for enterprise what it already was for the media industry. Yet again, Apple could announce "One more thing" which in that instance meant the redefinition of the Bring-Your-Own-Device experience: iTunes for Enterprise. While up to that point enterprises could create their own custom iOS apps according to their specific needs,

they needed third-party **Mobile Device Management** solutions to distribute and manage them. Sure, the **Apple alliance with IBM** did help, but with iTunes for Enterprise, Apple allowed companies to connect their secure iOS app stores to Apple's own infrastructure, and use iTunes as a familiar self-provisioning tool for their employees. Like Tim, any employee could now "Connect" their devices to their employers network at the press of a single button.

The iTunes for Enterprise announcement sent shares of **Mobile Device Management** solutions providers to a free fall, and left network operators wondering how to differentiate their enterprise offerings. It seemed Apple had decided to unify the experience of consumers and enterprise users. After all, they were all Apple customers, and Apple wanted to make their lives easier.

To be continued ...

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Apple: **TouchID, Apple SIM, Apple Pay, iMessage, Facetime, Continuity, Apple and IBM Alliance, IT Management for iOS**
 GSMA: **Embedded SIM**
 NASA: **NASA's journey to Mars**
 Wikipedia: **Mobile Number Portability, Mobile Device Management**

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in our second year and hope for
a continuing successful cooper-
ation.

The Neos Chronos Team

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