

Executive Summary

The explosive growth of data services means the telecom value chain is fragmenting rapidly. In the pursuit to increase revenues, many operators are losing out to application-, content- and device-providers, with the latter reaping a substantial share of customer revenues. In parallel, operators face rises in data traffic and increased user expectations in terms of quality of experience; and this is coupled with a corresponding decrease in the price they can charge customers for carrying each bit of data.

If it is not already the case, then the threat of operators becoming just dumb pipe providers is fast approaching. Without revisiting the design and capabilities of their networks, costs will surpass revenues for many operators within two years¹. To remain profitable MNOs need to invest in and create premium service offerings, and reduce Operational Expenditure (OPEX).

To reposition themselves and grab a share of future value in the digital era, MNOs must look to the successes of premium services provided by Internet players such as Google, Amazon, eBay, Activision Blizzard and Zynga. These companies are living proof that customers will pay for premium services.

One common requirement exists for introducing premium services and reducing OPEX: the ability of the underlying network to be adaptable, and easy to configure, while still ensuring reliability. These characteristics are exactly what a Self-Organising Network (SON) attempts to realise.

MNOs, therefore, need to re-position their investment into SON. The returns will be two-fold: they will have the platform to provide premium services and, their OPEX will be reduced.

This whitepaper presents the business model perspective necessary to achieve these results.

¹ Mobile Operators Profitability Challenged Within Three Years, Says Study

<http://www.prnewswire.com/news-releases/mobile-operators-profitability-challenged-within-three-years-says-study-115168859.html>

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1. Threats facing Mobile Network Operators

Shrinking profits mean the traditional revenue-generating model of Mobile Network Operators (MNOs) is under threat. One of the leading revenue streams for MNOs has been the sale of bandwidth, but margins are falling for bandwidth resale. Indeed, the cost of delivering mobile data is likely to exceed incremental revenues and become unsustainable for the mobile operators by 2013². Thus, the MNOs greatest resource is likely to become a ‘dumb pipe’!

In addition to the bandwidth market becoming saturated, maintaining telecoms networks is very labour intensive and results in increased Operational Expenditure (OPEX). This is because each network issue is typically followed by:

- Multiple alarms created by the network;
- Multiple highly-skilled network engineers manually resolving network error alarms;
- Multiple reoccurrences of the same problems that are investigated and resolved each time they occur.

It is, therefore, no surprise that large operators have been working to streamline their business. The Vodafone Group, for example, had set a target in 2008 to reduce their operating costs by £1 billion per year until the end of 2011 financial year³.

Simultaneously, there is a shortage of appropriately trained network engineers to manage the growing complexity of today’s networks. From our survey⁴, 77% of the 35 networking experts located around the world ‘agreed’ or ‘strongly agreed’ with the issue of skill shortage for network management. This, together with labour intensive operations, underlines the need for advanced automation in network management.

² Bridgewater Systems. (2010) *Whitepaper: Towards a Profitable Mobile Data Business Model*.

³ The New York Times. (2008) *Vodafone aims to cut costs by £1 billion*.
<http://www.nytimes.com/2008/11/11/business/worldbusiness/11iht-voda.4.17723676.html>

⁴ EFIPSANS. (2009) *Socio-Economic Studies Report-2*.

2. How to Increase MNO Profitability

Although the market continues to grow - ostensibly tilting towards saturation in terms of voice calls revenue, experts argue that the Average Revenue Per User (ARPU) is an important gauge of performance among telecoms operators. ARPU is the financial benchmark used globally by telecoms companies to measure the average monthly or yearly revenue generated from an average subscriber. In order to increase ARPU and profitability, the MNOs have two general options: a) Reduce OPEX; b) Offer premium services.

OPEX reduction is a major focus for both fixed and mobile network operators. Their attempts to lower operating expenses are creating a huge opportunity for technology vendors to build new revenue streams through managed-services which offload operational functions.

In parallel, MNOs revenues from voice, SMS and transmission data are decreasing - under pressure from VoIP⁵ providers and Internet Companies. Hence, MNOs need new sources of revenue to grow their profitability. The Internet has proven time and again that if services are good enough then consumers will pay for the Quality of Experience.

For example, Activision Blizzard, the makers of the World of Warcraft (11.5 million players worldwide), generates annual revenues of around €4 billion. Similarly, Zynga was founded only in 2007 and develops Facebook applications, but it is already generating revenues of around €200 million per annum. MNOs, therefore, need to focus on new premium services where the competition is less fierce; for instance, augmented reality, social media and the Internet of Things.

Reducing OPEX and introducing new premium services gives rise to one common requirement: the ability to ensure real-time network QoS, network reliability and provisioning.

⁵ Voice over Internet Protocol

3. Re-inventing the Business Model

Our open, digital economy means that MNOs can no longer preserve total ownership of the entire value chain. MNOs no longer have strict control over three revenue sources: bandwidth, duration and distance. This may invoke a fear among MNOs that they will be relegated to the role of a ‘dumb pipe’, capable of providing nothing more than access and network capabilities for others.

This is a valid concern, since an open, digital economy offers customers the chance to buy services, applications and content from their vendor of choice. However, MNOs should view freedom of choice more as a positive development than a negative one, since this leads to an opportunity for MNOs to re-position themselves as key players in the evolving digital economy’s value chain.

Current investment from MNOs is based on the legacies of providing connectivity and bandwidth. As the Return of Investment (ROI) in adding bandwidth declines, operators are searching for new ways to reverse this trend. They need to spend less on running the network and more on the provisioning of revenue-generating premium services.

Case Study

Portugal Telecom has evolved their business model towards becoming an integrated service provider. Its strategy for new markets resulted in an historical inflection in retail line loss on the back of the success of meo. Meo - an integrated offer of voice, Internet and pay-TV services, including services as VoD, EPG, TV recording, gaming is based on ADSL2+, FTTH and DTH. This success is due to the differentiated (new and unique) bundled services and content offered that took advantage of the access/transport networks and their technologies.

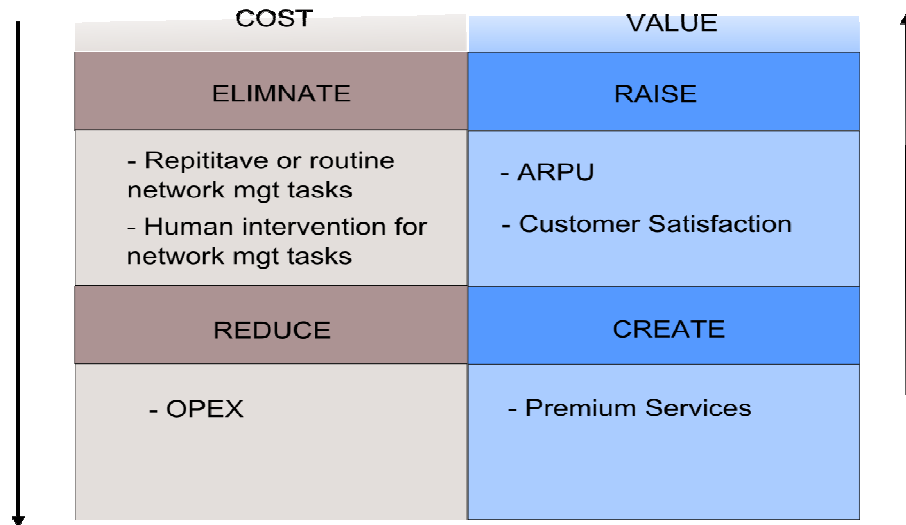


Figure 1 Business Model Perspective

For MNOs to increase their revenue streams, their investment portfolio needs re-positioning. A business model perspective⁶ is proposed in Figure 1. The re-positioning of investment is targeted towards the creation of premium services. But to achieve this revenue for re-investment, MNOs must eliminate as many routine management tasks as possible. This will lead to a reduction in OPEX, which in turn allows for investment in creating premium services. Revenue-generating premium services will increase currently falling ARPU and overall customer satisfaction.

Some operators already have made strides in this direction; see Case Study on Portugal Telecom.

As stated, current OPEX levels must be reduced by MNOs. A number of mechanisms are available to operators in order to achieve this, as shown in Figure 2. Outsourcing and Self-Organising Networks (SONs) are the mechanisms most likely to have the greatest impact on OPEX reductions.⁷

⁶ Blue Ocean Strategy. *4 Actions Framework*;
http://www.blueoceanstrategy.com/abo/4_action.html

⁷ Note that in order to achieve the maximum reductions in OPEX, a number of the mechanisms must be combined. The degrees of saving will vary, depending on the chosen mechanisms and techniques combination.

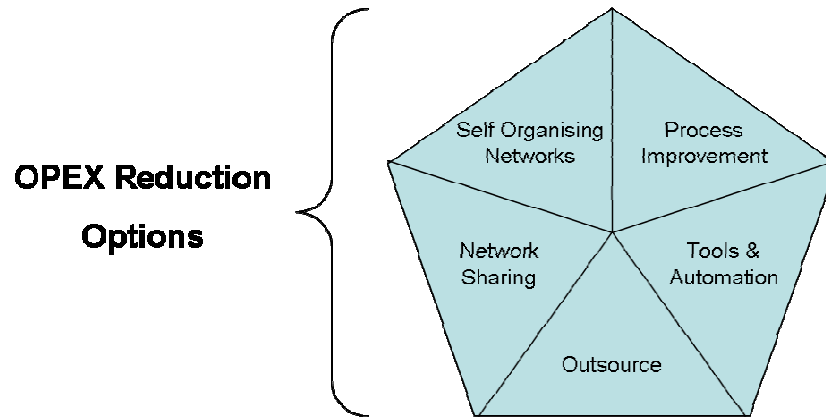


Figure 2 Methods for Reducing OPEX

4. Outsourcing

Outsourcing network operations to third-party managed-service providers⁸ has grown tremendously in recent years – so much so that all the major Network Equipment Vendors (NEV), (Ericsson, Nokia-Siemens Networks, Alcatel-Lucent, Huawei, etc.) have added a professional services arm to their portfolios. Outsourcing is perceived as a much less risky proposition in the drive to reducing OPEX.

As the global economic crises hit bottom lines, NEVs have seen managed-services business often prop up the ailing network infrastructures sales, allowing them to report somewhat healthy balance sheet in some cases.

Operators are contracting managed-service providers to fill certain needs that are more cost effective to outsource than to develop, purchase or support in-house. This sort of arrangement makes good economic sense for both small and large companies.

Outsourcing only moves the problem

The issue of ensuring that the network is capable of addressing the demands of new innovative premium services still exists though - it has just moved from the operators to the vendors, i.e. the managed-service providers. And it still needs to be solved.

⁸ Ericsson Gets 5 Yr Managed Services Pact From Du In U.A.E, <http://online.wsj.com/article/BT-CO-20110202-704654.html>

5. Self Organising Networks (SONs)

The move towards MNOs creating new premium services highlights more than ever the need for networks to be able to self-manage. To offer premium services, an MNO must ensure that the underlying network has the ability to: change and react in real time; re-provision network resources based on load; and, be able to deploy new services with ease. These characteristics are exactly what SONs attempts to realise. It does not matter whether SONs are implemented by the MNO in-house or as part of an outsourcing agreement – they will still be a key enabler in deploying premium services.

The principle of SON is simple: reduce operating costs by eliminating manual configuration. The challenge is to achieve this in a reliable manner without introducing network performance degradation or an outage.

Next Generation Management Networks⁹ (NGMN) is an alliance of Network Operators, and it outlines the requirements for SON with the ultimate goal of increased automation (and therefore reduced OPEX). The challenge is for the NEVs to bring to market next-generation networks that are capable of SON so that Network Equipments' can be plug-and-play; i.e. after installation and power-up, the Network Elements can determine their optimal configuration based on their location and that of peer network elements.

The most significant impact of increased automation will be on the management of mobile networks compared to other network access technologies. Mobile data traffic is expected to grow at a compound annual growth rate (CAGR) of 108% between 2009 and 2014, reaching 3.6 exabytes per month by 2014¹⁰. Additionally, mobile networks are deployed globally involving substantial numbers of network elements as well as actual mobile network technologies.

However, compared to advances in transmission rates and bandwidth capacities, there has been little innovation in the management of mobile networks. Configuration and optimisation of mobile networks require careful planning and provisioning to achieve optimal geographical coverage and to

Industry has recognised the need for self-organising networks and is making steps to tackle it

avoid network outages. This is against a backdrop of supporting multiple Radio Access Technologies (RAT) and faster time-to-market in an increasingly competitive environment.

Industry initiatives, in particular the NGMN, have been established to demand that management deficiencies are tackled by NEVs for future mobile networks or 4G. Standardisation initiatives in 3GPP regarding SON are already underway to meet this demand.

⁹ <http://www.ngmn.org/>

¹⁰ Cisco Visual Networking Index: Global Mobile Data Traffic Forecast Update, 2009-2014

6. Conclusion

New solutions are needed that allow management of the network to evolve so that it is increasingly automated. This will allow MNOs to focus their efforts on the assured delivery of premium services.

Most importantly, OPEX savings made through SON will underpin the necessary re-positioning of investment into premium services. Premium services in turn will increase revenues, which is fundamental and essential to profitability.

7. About TSSG

The Telecommunications Software & Systems Group (TSSG) is an Irish research centre that is addressing the transformation of the telecoms industry. Its core focus is network management, security and mobile services.

The TSSG performs research to identify innovative ways of integrating self-managed systems into the network provisioning lifecycle. Central to this research is the development of autonomic management solutions that incorporate semantic analysis. These can be used to build federated network and service management systems.

The TSSG recognises the importance of reliable self-management necessary to enhance the dependability of the network management systems that are used by network operators. A major focus for the TSSG is the research and development of key methods and techniques that increase the ability of management systems (specifically self-managed systems) to operate in a way which limits disturbances to its network services.

The TSSG has many years experience in advanced Network Management Systems – some recent projects are listed below:

SON-related projects in TSSG

FP7 4WARD	http://www.4ward-project.eu/
FP7 EFIPSANS	http://www.efipsans.org/
FP7 AutoI	http://ist-autoi.eu/autoi/
FP6 MORE	http://www.ist-more.org/
Celtic Eureka Magneto	http://www.celtic-initiative.org/Projects/MAGNETO/default.asp/
Celtic Eureka Madeira	http://www.celtic-madeira.org/
SFI FAME	http://www.fame.ie
EI ASYST	http://www.asystnm.com/
EI ASTRAL	http://www.asystnm.com/astral

TSSG is also one of the founding members of two of the ETSI Industry Specification Groups (ISGs): (i) AFIs (Autonomic network engineering for the self-managing Future Internet) and (ii) MOI (Measurement Ontology for IP traffic).

Acronyms

3GPP	3 rd Generation Partnership Project
ACF	Autonomic Communications Forum
ADSL	Asymmetric Digital Subscriber Line
CAPEX	Capital Expenditure
DTH	Direct-To-Home
EPG	Electronic Programming Guide
ETSI	European Telecommunications Standards Institute
FTTH	Fiber to the Home
IEEE	Institute of Electrical and Electronics Engineers
IP	Internet Protocol
LTE	Long Term Evolution
NEV	Network Equipment Vendor
NGMN	Next Generation Mobile Networks
OPEX	Operational Expenditure
QoS	Quality of Service
RAT	Radio Access Technology
SFI	Science Foundation Ireland
SON	Self Organising Networks
VoD	Video On Demand

Disclaimer

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