



How much intelligence will you pack into your LTE network?

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Introduction: Dumb Networks Are History

Mobile development and innovation appears to happen in cycles of a decade. The 1980s saw the first mobile networks. By the 1990s we had Global System for Mobile (GSM) Communication. Another 10 years later, Second Generation (2G) and then Third Generation (3G) technology changed mobile networks. In 2010, 4G, also known as Long Term Evolution (LTE), made an appearance. Each development has seen slow, incremental change: from voice and SMS to MMS and video calls; then mobile TV and video calls; and finally real-time interactive information and transactions.

With each change, user expectations have grown. Today, users expect anytime anywhere access to their personal and enterprise information, data and applications. The opportunities before network operators have

been increasing, but they have been slow to leverage it. Their response has been one dimensional - each network improvement has been limited to delivering more data with less pain.

Fundamentally, the approach to meeting growing traffic has meant putting fatter pipes in place to deliver the data. The underlying nature of the pipe has remained the same. They continue to be dumb. Could network operators have missed an opportunity to enhance services and revenue by building intelligent pipes to deliver the data?

An examination of public or private roadways designed as toll ways provides an effective analogy. Toll for road usage varies depending on the type of vehicle - truck, bus, car, two-wheeler - used and on time-based access. The road infrastructure owner ensures level of quality that delivers a predictable drive experience. But usage fees are not flat. They are based on the type of vehicle passing through. Is there a takeaway in this for network operators? Can network operators charge users based on the type of content passing through their pipe? What are the implications of such a model? What are the technical requirements? How can Quality of Service (QoS) be guaranteed for different kinds of traffic? What kind of partnerships will need to fall in place to make such a model effective? How will the mobile ecosystem - from operator to content provider and the subscriber - benefit?

Intelligent Networks to Boost Revenue

Current business models lead to network congestion that quickly degrades customer experience. Operators try to manage this in one of several ways. They block usage of data intensive apps or create volume-based capped schemes. Either ways, the network continues to invest in bandwidth in order to tap revenue opportunities. As a result, offerings get commoditized. Operators experience low ARPU and high Capex that threatens the stability of the business model.

The solution to the complex situation is to create networks that understand what is going through them.

Knowing what is in the pipe can help use resources intelligently and optimally. As an example, imagine this: a subscriber tries to view a data-intensive video but has to view the "buffering" icon for several seconds before being able to watch the video. Can the network intelligently offer the subscriber a temporary "network boost" (for a price) to eliminate buffering and improve the experience?

These methods have the capability to differentiate networks and improve revenue from the subscriber side. But they also hold the very real possibility of generating revenue from Content Service Providers (CSP) based on collaborative and mutually beneficial partnerships.

With the current level of investments being made in LTE, such partnerships will become imperative in order to recover costs and retain users.

The operator-CSP partnership can work if the LTE network leverages IT to:

- **Manage available resources** optimally by analyzing the content the user wants
- **Improve customer experience** by putting the customer in control of usage, QoS and payment options
- **Build and manage self-service channels** to enhance operational efficiency
- **Provide personalization and service bundles to the customer** based on needs, location and device
- **Create new payment models** based on content fromz different content providers, access device and time-of-day
- **Become situation aware** to deploy various business models
- **Deliver business intelligence to CSPs** in real time to enable content decisions that drive revenue

Intelligent networks are the key. They can interpret usage to nudge customers with prompts and offers. Simultaneously, intelligent networks can also activate the most appropriate business models. As an example, think of a user who routinely watches football games. A few hours before a match, the system can push advertising to the user in exchange for a temporary boost in bandwidth during the game. In this manner advertising can improve user experience by supporting known usage patterns.

Online Charging Systems (OCS) to bind ISP and CSP collaborations

There are innovative ways in which ISPs and content providers can monetize the data explosion in a mutually beneficial B2B model. The model involves setting up an intelligent network that captures and analyzes subscriber behavior, allowing the ISP to sell intelligence on the subscriber's usage to CSPs.

An Online Charging System (OCS) rests at the core of such collaboration. The OCS keeps track of the data being used by the CSP as well as subscriber consumption.

The Key drivers of the OCS are:

Growth in IP Traffic: The rise of smartphones and apps has created a sharp increase in IP Traffic: The rise of smartphones and apps has created a sharp increase in IP traffic and data volumes. Cisco visual index indicates that by 2017 non-PC devices will account for 49% of total IP traffic demonstrating the demand by Web-enabled TV, tablets and smartphones. It is imperative for CSPs to tap the growth by introducing new service and staying relevant in the market.

Customer Self Service and Control: With smart devices finding widespread adoption, the demand from customers is for personalization along with flexible charging and billing options. The CSPs that offer such plans are the ones that will retain customers.

OTT Application and Content Provider's Growth: CSPs want to monetize the usage of their OTT applications and content in order to deliver better



SLAs. The emergence of OTT players that challenge traditional operator revenue sources, such as voice and SMS, has accentuated the need for CSPs to mine new revenue sources such as network, quality and customer data to third parties.

Convergence of Prepaid and Postpaid Services: The trend is for enterprises to allow employees to bring their own devices. Employees use the same device for personal as well as business applications. Employees (subscribers for the provider) would want personal use based on prepaid balance and a managed quota, whereas postpaid would be preferred by the enterprise for business use.

How IT can unlock the opportunity

As the LTE ecosystem evolves around collaborative efforts, structural changes in the IT stack become necessary. These changes are around:

- **Provisioning and Activation:** LTE will co-exist with 2G, 2.5G and 3G networks for some time and IP Multimedia Subsystems (IMS) for the future. This adds to the complexity of provisioning and activation of services
- **Policies:** LTE will need an introduction of Policy and Charging Rules Function (PCRF), allowing subscriber-based profiling at an individual

level. Policies will need to be integrated with activation systems, billing function and performance management systems to ensure QoS control

- **Customer analytics:** LTE networks will need to analyze subscriber content consumption in relation to CSPs and cross charge. This also emphasizes the need for partner management systems (product catalogue, order management, revenue calculation and settlement)
- **Payment Processes:** New protocols based on Diameter and GTP need to be supported for collection and distribution. New products need to be configured for real-time billing systems

At the center of the opportunity is content availability. A major reason 3G failed to gain traction in many non-urban geographies is because of the lack of local content.

Content provides a compelling reason for users to opt for carriers who provide the necessary data and also to increase their data usage. Meaningful content – news, social, business, transactional – increases stickiness. It also drives networks to provide and maintain QoS that users are willing to pay for.

Much work needs to be done in addition to creating CSP collaboration and revenue sharing models. LTE networks that focus on new products and services based on content; packaging and marketing of new bundles; billing and support services; and applications that create service differentiators, will lead the way in leveraging the true potential of LTE networks.

About the Author

Sridhar Saranathan is a Principal Consultant at Wipro, handling domain and IT Strategy consulting and practice for the Communication Service Provider industry. With over 30 years of experience in the fields of IT and telecommunication, Sridhar has led IT transformations during M&As of large mobile operators. He has expertise in end-to-end architecture of CRM, OSS, BSS, customer self-service, mobile and location-based applications. He has a post-graduate degree in Operations Research and Analytics and a Bachelor's degree in statistics, numerical methods and Computer Science.

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WIPRO LTD, DODDAKANNELLI, SARJAPUR ROAD, BANGALORE - 560 035, INDIA

TEL: +91 (80) 2844 0011, FAX: +91 (80) 2844 0256

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