

MARKET SURVEY:

Telecom Technologies: Fuelling Electronics and T&M



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The long term evolution (LTE) era in India started when Bharti Airtel launched the nation's first fourth-generation (4G) telecommunication network in the city of Kolkata on April 10, 2012. This service has expanded to 15 cities across India, and now Reliance Jio Infocomm is set to roll out its 4G LTE services in 800 cities in India by June this year with their mi-fi devices and 4G dongles. Will 4G and 5G find success in India? Which of the telecom-enabled sectors call for investment?

Increasing 4G adoption in India

According to International Data Corp. (IDC), India is the fastest growing market in Asia Pacific region with a quarter-on-quarter (QoQ) growth of 27 per cent in the third quarter of 2014.

Telecom Regulatory Authority of India (TRAI) reported 955 million mobile phone

subscribers in the country by the end of March 2015.

PricewaterhouseCoopers (PwC) India, as mentioned in their 'Five Trends to Watch in Telecom During 2015' report, expects 4G LTE subscribers in India to reach 10 million to 15 million by December 2015, driven by competitive pricing, superior network experience and affordable smartphones.



Telecom electronics and infrastructure development

According to Tata Communications' Annual Report 2013-2014, in 2013, mobile devices accounted for 16 per cent and telecom infrastructure for nine per cent of the global telecom market.

The problem of inadequate infrastructure support in India led to the launch of shared mobile infrastructure scheme by Universal Service Obligation Fund (USOF) to provide subsidy support for setting up and managing 7353 infrastructure sites or towers spread across 27 states in the country where there were no existing fixed wireless or mobile network coverage.

When the scheme was closed at November 2013 end, 7317 towers had been set up. This infrastructure is now shared by three service providers with 16,254 base transceiver stations (BTS) commissioned for provisioning of mobile services.

Test and measurement systems to support. With an increase in the number of advanced communication networks and introduction of customised standards, need for advanced test and measurement (T&M) equipment required for research and development (R&D) labs, mobile devices, base stations and mobile backhaul, etc also increases. This includes spectrum and signal analysers, radio frequency and microwave communication testers, multiple input multiple output (MIMO) testers, oscilloscopes, signal generators and so on.

Imaging systems used for inspecting faults in electronic sub-systems of the telecom system is another field in testing that would grow with 3G, 4G and its successors.

Making it in India

Reports from Directorate General of Foreign Trade (DGFT) for 2013-2014 show that the export and import of telecom electronic equipment in India (including mobile phones and their parts, cables, base stations, transmission and reception apparatus, data conversion and regeneration mechanism and switching systems) touched

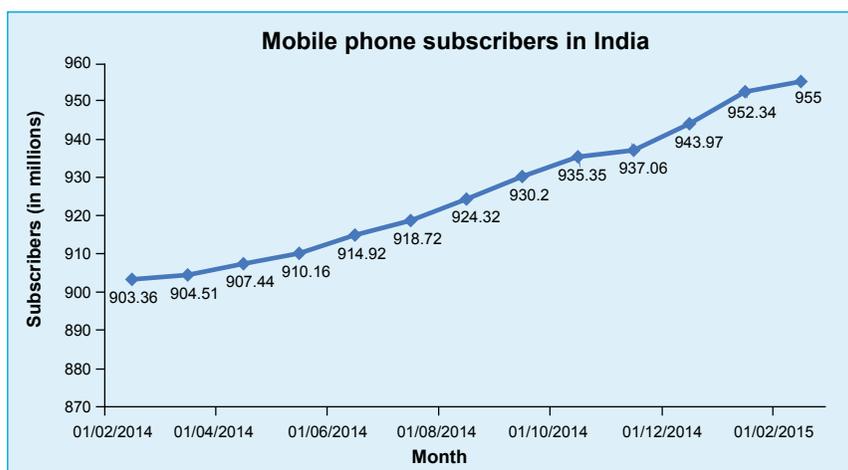


Fig. 1: Chart showing the growth of mobile subscribers that spurs mobile phone sales

₹ 195.79 billion and ₹ 685.09 billion, respectively. This shows the vast opportunities open to electronics components and devices manufacturers, and infrastructure providers in the country.

The first step. The Indian mobile phone brands Micromax, XOLO (Lava International), Karbonn, Spice and Celkon have been manufacturing their handsets in China and importing these to India.

According to reports from Press Trust of India, Micromax has started manufacturing mobile phones at its Rudraprayag plant in Uttarkhand, where they have already been manufacturing LED TVs and tablets. This is a giant leap towards the indigenous manufacturing movement started by the government of India.

Going ahead. Big mobile phone vendors, in the near future, are expected to start making their devices in India. This move towards local manufacturing can be seen from Samsung's announcement that the firm will start manufacturing Samsung S6 and S6 Edge smartphones in their two Indian manufacturing plants by second quarter of 2015.

Chinese manufacturer Xiaomi also has plans to start manufacturing in India within the next two years, as mentioned by the company's vice president, Hugo Barra, to Bloomberg.

The new in line is vivo Mobile that recently entered Indian market through a partnership with Viacom

18's integrated network solutions (INS). According to a report by Business Line, director of vivo Mobile India, Jacky Liao, mentioned that the company is keen on manufacturing their phones in India and will look at it in the next three years depending on its growth.

Barriers: Infrastructure and competitors

While we find companies moving towards establishing their manufacturing units in India, handset giant Nokia Oyj shut down its plant in Chennai last year. Soon after this move, electronics contract manufacturer Foxconn Technology Group also suspended its operation in the country.

This could have a negative impact on the local manufacturing campaign. What we find here is a missing ecosystem that provides mobile phone components such as processors, displays, batteries and other parts.

Indian mobile industry is also concerned about the preference being given to Vietnam as a manufacturing hub due to its investor-friendly ecosystem, better incentives and other benefits from their government.

Manufacture of handsets in India, apart from creating employment opportunities, would also lead to cheaper, good quality phones. But in order for this to take off, the government needs to facilitate a component manufacturing ecosystem here.

SWOT Analysis

	Helpful	Harmful
Internal	<p>Strengths</p> <ol style="list-style-type: none"> 1. Strong subscriber base 2. Supportive government policies 3. Technical expertise 4. Human capital 5. Start-up incubation centres across the country 6. Faster adoption of technology 	<p>Weaknesses</p> <ol style="list-style-type: none"> 1. Absence of home-grown market 2. Dependency on legacy technologies 3. Inherent lack of infrastructure 4. Lack or delayed implementation of well-defined domestic standards and policies 5. Less popular bundled telecommunication services 6. More prepaid users 7. High sales tax rates and duties for domestic manufacturers 8. Poor network coverage
External	<p>Opportunities</p> <ol style="list-style-type: none"> 1. Market for any new invention 2. Data explosion 3. Shooting number of mobile devices 4. Increased demand for better quality of services 5. Push for Indian manufacturing movement 6. Innovations that utilise commercial prospects of 4G and 5G 	<p>Threats</p> <ol style="list-style-type: none"> 1. Import of low-quality devices 2. Cheap handsets by Chinese manufacturers 3. High cost for buying spectrum and developing infrastructure

are no stringent rules and regulations regarding the minimum quality requirement to sell a product in the Indian market.

In addition to this, import duties here are low. This negatively affects the performance of the network.

Key performance indicators for a device need to be set higher. Nagaraja Upadhyya, vice president of network product line, Huawei Technologies Co. Ltd, India, however, has a different opinion. He stresses that the need of the hour is development of a 4G ecosystem in India, which is possible only if more people can access 4G technology at a lower cost. He also mentions that affordable handsets need not always be of low quality.

Effect on electronics industry

The effect on some segments of electronics industry by advancements in telecommunication technologies are described below.

PCB industry. The advanced telecom technologies lead to increased feature sets with lowest form factors, resulting in complex designs. Due to this, printed circuit board (PCB) designers and manufacturers specialising in this field require adoption of high-performance PCB design and circuit simulation tools, additional design analyses, manufacturing verification tools and an upgradation of existing design methodologies.

Another challenge is electronic systems' reliability since it is very important to telecom and data communication service providers.

However, reliability of a PCB is dependent on its thermal performance, which increases with complexity and reduced computing time. This makes sophisticated system-level thermal design and management a vital part of designing telecom equipment.

"A PCB designer has to manage power dissipation and optimise the thermal design by modelling and analysing PCB temperatures using design analysis tools," says Dhiraj Kumar, director - systems engineering, Argus Systems.

"If telecom manufacturing develops in India, it would provide a huge boost to the T&M sector too."

—**Jayanth Ramachandran**, regional manager, Rohde & Schwarz India Pvt Ltd

"The telecom sector is partnering with other industry segments to build a strong, connected ecosystem."

—**Nagaraja Upadhyya**, vice president of network product line, Huawei Technologies Co. Ltd

"High-speed and high-quality connectivity can be brought to rural areas by leveraging existing infrastructure."

—**Ravi Manik**, director of business development, Broadcom India and South East Asia

"Customs clearance has to improve for the volume of production to pick up."

—**Srinivasa Moorthy**, director of design engineering, D4X Technologies Pvt Ltd

"GSM is still popular in India for cost-effective voice services for business enterprises and will remain that way for the next two years at least."

—**Dhaval Bhagora**, marketing manager - telecom solutions, Matrix Comsec

"There should be a mechanism in which the telecom technology arm of the government interacts with the industry to create a product development roadmap and requirement specifications that can be taken up by product engineering companies."

—**Dhiraj Kumar**, director - systems engineering, Argus Systems

Affordable devices: A boon or a curse

A big challenge for deploying the 4G system was the lack of supporting devices. While 4G-supported phones were a luxury till last year, the second half of 2014 saw the launch of several affordable 4G handsets.

Apart from established foreign brands like Huawei, Motorola (acquired by Lenovo Group) and Xiaomi, and the previously-mentioned Indian brands, Indian market also sells cheap, low-quality, generic Chinese handsets.

In a way this is beneficial to the country as LTE rollout becomes faster with increasing demand from customers. But, Jayanth Ramachandran, regional manager, Rohde & Schwarz India Pvt Ltd, points out that increased usage of low-quality devices would load the network, leading to reduced speed and performance. How do we solve this problem?

Need for customised standards

Increased import of low-quality devices is due to the fact that there

Design and manufacturing services. For telecom products design and manufacturing services, apart from achieving increased complexity of designs at lower costs, lesser time to market is a critical factor. This demand is met by many firms using concurrent engineering where different tasks for developing a system are performed in parallel.

Infrastructure development. With an increased number of affordable devices and increased adoption of latest technologies, there is a major push from customer end for better connectivity. This thrust to connect remote locations positively affects telecom infrastructure developers. "Improvements in technology also help us serve more customer segments," says Dhaval Bhagora, marketing manager - telecom solutions, Matrix Comsec.

Business organisations are now looking for integrated communication solutions to improve their services. Connectivity within offices, between branch offices, and in sales and supply chains are some new trends as seen by Matrix. "With growing volumes, components and products also become cheaper," adds Bhagora. This is a good phenomenon for manufacturers and infrastructure providers. The challenge here is to install systems that have low maintenance and are easily upgradable.

Business opportunities across several verticals

Fifth-generation (5G) networks would use an expensive communication technology, predict industry experts, and would prove more beneficial for business sector rather than individual consumers. "This is due to the ability of LTE over its predecessors to prioritise the customer or service grade," comments Srinivasa Moorthy, director of design engineering, D4X Technologies Pvt Ltd.

Moreover, LTE offers better mobility, speed, security, bandwidth

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and ease of setting up as compared to Wi-Fi, making it suitable for business models involving the Internet of Things (IoT) and machine-to-machine (M2M) communication.

An article published by Arthur D. Little titled 'The Business Benefits of 4G LTE' suggests that enterprise mobility of 4G and advanced technologies can bring increased sales, improved customer service, reduction in cost, flexibility, agility and decision-making capabilities in businesses.

Healthcare. We find that wellness and health industry is very enthusiastic about developing telecom technologies, and it is expected to be one of the most benefited sectors.

Tele-medicine, by virtue of which a doctor at a remote location can treat a patient using video-telephony, will become easier with better streaming and high-quality imaging.

4G can also be used for connecting ambulances to hospitals for in-transit treatment. Such ambulance systems are already employed in University Hospital of Saarland, Germany (Mobile Stroke Unit) and London's Air Ambulance; paramedics can perform CT scans on patients en route and results can be sent to doctors in the emergency room. This has proven to increase the survival rate of stroke patients.

Popularity of 4G is also bringing more focus on preventive medicine and assisted living for the elderly.

A completely fit person can also keep track of his or her health and balance the lifestyle accordingly.

There are several wearable devices and mobile apps in the market or in development stage that can keep record of activities and analyse information on cloud to predict possibility of illnesses.

Automotive. With the push for in-car services by consumers and immense R&D going on in the connected car segment by car manufacturers like BMW and Mercedes-Benz, the automotive industry could benefit immensely from the high-speed LTE network and its successors.

Remote condition monitoring, in-vehicle Wi-Fi hotspots, predictive engine diagnostics, real-time navigation and location based services are the notable trends in this segment.

Mahindra Reva, Indian car manufacturer, currently has commercial electric cars that can be controlled by a smartphone app. The company is also undertaking extensive R&D to manufacture driverless cars.

Definitely a fast growing sector

The Indian telecommunication industry is the second largest in the world and is growing at a rate of 45 per cent, according to the government's Department of Telecommunications.

All telecom services in India are open to private players, and they now hold more than 85 per cent of the share as against five per cent in 1999. With demand for better-quality services, faster rate of technology adoption and innovations in this segment, the telecom sector opens up immense opportunities for the electronics industry. ●