The market for telecom test and measurement (T&M) equipment has grown over time, in tandem with the growth in the telecom sector. Moreover, the large scale roll-out of 4G services by operators has renewed interest in the T&M space. While this has opened up new avenues of growth, it has also brought in fresh challenges for the T&M industry. Industry experts share their views on the changing T&M requirements, emerging trends in this space, challenges faced by T&M players in India and the future outlook...

How have the T&M requirements of the telecom industry changed over time? What are the key growth drivers?

Rahul Agarwal

T&M requirements have changed over time with the evolving standards in the telecom industry. The industry has witnessed unprecedented growth in the past two decades and with an increasing subscriber base, the deployment of next-generation technologies and unprecedented data traffic, network complexity has also increased. The proliferation of smartphones, tablets and phablets has led to an amazing growth in mobile data traffic. Moreover, with data-hungry applications such as video, cloud computing, social media and machine-to-machine (M2M) gaining popularity, an explosive data traffic growth is likely in the days to come. New technologies along with the multiple devices add more complexity to an already complex environment, necessitating the use of T&M equipment to optimise networks.

Vishnu Goel

The T&M requirements of the telecom industry are always driven by two considerations – performance and conformance of the equipment and systems to industry standards. Performance specifications are tested as per the manufacturer's references and conformance parameters by the concerned standards. As the Indian telecom T&M industry is largely global in nature and local manufacturing of both terminal and network equipment is undertaken based on acquired technology, reference selling with big telecom manufacturers determines the local revenues. The emergence of new global players and technology providers requires customisation and automation on the T&M platform. For instance, recently a lot of assembly lines of handsets were established with the help of Asian companies. However, software defined networking and other network management softwares are still being sourced from the West.

The key growth drivers of the T&M industry are the introduction of new telecom technologies, explosion of data/video services, roll-out of 4G services, new quality of service (QoS) demands resulting from the increase in call drops, conformity to radiation specifications, spectrum management, etc.

Murtuza Kachwala

The requirement for T&M products and solutions emerges at several stages of wireless communication, right from the design and development of wireless equipment to network deployment and service assurance. In recent years, the T&M market has undergone a significant shift in its offerings in response to new technology demands by operators. Applications such as mobile TV, m-banking, m-health, m-education and e-retail, and the convergence of technologies have enhanced the demand for specialised T&M solutions.

The market is increasingly adopting a software-defined approach towards instrumentation, which allows expeditious upgradation of solutions as per changing network and technology requirements.

Wireless equipment and network testing continue to dominate the space with long term evolution (LTE), voice-over-LTE (VoLTE), QoS, scalability and smart devices being the key growth drivers. On the other hand, the growth in the optic fibre cable (OFC) testing instruments market has largely been driven by the increasing demand for splicing machines.

On the network and infrastructure fronts, operators are ensuring that their networks are interoperable with the currently available 2G and 3G services (and 4G services, in some cases), and can enable a seamless switch when moving from one technology to another.

What are the latest trends in the telecom T&M segment in India? How has been the traction for rental T&M?

Rahul Agarwal

The inherent characteristic of the T&M market is such that the evolving telecom standards render T&M equipment obsolete quickly. Hence, the rental market has gained traction as it allows the customer flexibility to switch to the latest equipment without incuring significant

investment.

Vishnu Goel

For the past few years, there has been greater emphasis on 4G roll-out. Moreover, operators have been anticipating a significant increase in competition due to the entry of a new player. These have led to speculations on the T&M side of the industry. The decision to undertake either new capex or lease rental involves arguments within a user organisation. Smart offerings like choice rentals and flexible support enable many T&M vendors to capture this market. The combination of a good original equipment manufacturer (OEM) and a leasing company is likely to gain a dominant share in the market.

Murtuza Kachwala

The latest trends witnessed in the telecom T&M segment are high bandwidth measurements, multiple-input, multiple-output testing and special tests on LTE-advanced technology. There is also protocol testing and wide area network (WAN) optimisation testing. In addition, quality tests that are required by the operator before accepting systems supplied by the manufacturer are being developed.

The National Telecom Policy, 2012 mandated the testing and certification of all telecom products for conformance, performance, interoperability, health, safety, security, etc. for the seamless functioning of existing and future networks. However, over the past few years, telecom operators have not earmarked significant capital for deploying T&M solutions to address the growing complexity in their networks. Low ARPUs, substantial outgo on spectrum acquisitions and the high price of T&M equipment have compelled operators to opt for renting and leasing of non-calibrated or technologically less advanced equipment over making fresh purchases.

How is the T&M industry benefiting from the roll-out of 4G technologies? What is the impact of Wi-Fi and fibre roll-outs on the segment's growth? What opportunities does 5G promise?

Rahul Agarwal

Globally, telecom service providers are focusing on mobile traffic Wi-Fi offload strategies. It is important to ensure that the quality of Wi-Fi networks becomes carrier-grade as a lot of mobile data is expected to be offloaded on to Wi-Fi networks. If the quality of Wi-Fi services is unsatisfactory owing to incorrect offloading procedures, customer churn will increase. A shift to carrier-grade Wi-Fi is also being witnessed, which may increase the demand for Wi-Fi carrier-grade test and monitoring solutions. Similarly with increased and widespread fibre roll-outs, OFC testing instruments are also in demand.

5G has the potential to revolutionise many industries such as telecommunications, automotives, energy, health care and more. The technology is expected to be several times faster than 4G and would provide a backdrop for the billions of devices to be connected to the internet as it would boost M2M communication and the internet of things (IoT) market. Research and development of 5G communication networks remains one of the most important drivers of the telecom T&M market. It presents a huge challenge for T&M vendors as they prepare to handle the different use cases and architecture of 5G.

Vishnu Goel

Whenever a new technology is rolled out, the associated installation and commissioning equipment witnesses a bullish demand. 4G was a major purchase opportunity fuelled by the existing 2.5G and 3G players' desire for quick upgradation. Likewise, 100G and 400G should see the introduction and uptake of appropriate test equipment.

Offloading mobile data on the Wi-Fi network is now regularly being undertaken. However, QoS and associated customer experience differs in different geographies and on the basis of backhaul equipment deployed. Here again, competitive pressure makes the operators go for better T&M for monitoring and control purposes.

Initiatives like Digital India, e-governance and many smart services are leading to fiberisation of the pathways of information in the hinterland. The same is true for large-scale deployment of communication networks for defence forces. The testing of fibre has boosted the sale of T&M hardware and services.

The introduction of 5G services is likely to happen through Western companies in the next three years and Asian involvement with regulatory standards will be limited. Moreover, the Western European region will strive to renew its competitive edge in the market through this technology.

Murtuza Kachwala

The large-scale roll-out of LTE technology has renewed interest in the T&M space with operators increasingly looking to deploy advanced solutions for assessing and addressing the complexities associated with the network. To this end, Reliance Jio Infocomm Limited (RJIL) and Bharti Airtel have awarded 4G network testing contracts to US-based T&M equipment provider Keysight Technologies. The contracts are reportedly worth Rs 1 billion each. The demand for LTE and VoLTE testing equipment is set to grow. This has created multiple opportunities for small T&M vendors and has helped generate rural employment.

Further, the rapid evolution towards higher frequencies and wider modulation bandwidth, coupled with the advent of technologies such as 5G, is creating growth opportunities for advanced T&M equipment. However, providing electronic engineers with superior equipment at competitive prices will be a challenge for T&M vendors from a technical as well as business standpoint.

Service providers are also well aware of the limit of net connectivity through wireless media. It is more than clear that heavy data users need to be provided broadband with higher bandwidth as they cannot be served with wireless connectivity to the fullest extent.

Therefore, there has to be fibre connectivity up to the end-users' premises. All service providers are vying for space in the market against various types of challenges coming from overcrowded localities in Indian cities. Against all these odds, service providers are investing and working on fibre-to-the-home, which will ultimately provide viable solutions for the users and speed much higher than 4G or 5G. So, fibre roll-out is creating new opportunities in this segment.

What issues do telecom T&M players face in India? What have been the key challenges in the 4G space?

Rahul Agarwal

The T&M market is extremely price sensitive. Reducing testing time, which will yield significant cost savings for OEMs, is another challenge for test equipment vendors. End-users of test equipment are not satisfied with the exponentially rising testing costs. They are striving to reduce the costs through various means, including the acceleration of testing tasks. Although OEMs would like to reduce testing costs, this is challenging for T&M vendors because the amount of testing is increasing significantly. There is a strong push to conduct more testing for less money in a completely different and innovative manner because end-users are not able to transfer the increasing costs to consumers.

Moreover, the increasing complexity of technologies has added to the woes. The evolving standards have made the product life cycle of T&M equipment short, hence equipment have to be upgraded/developed for keeping pace with the changing standards.

Vishnu Goel

Telecom T&M players in India are mainly local subsidiaries of top MNCs. While we have very qualified techno-managers and industry professionals, managing a specialised skill-based workforce is challenging in a country like India. Further, growth in telecom following the surge in mobile subscriptions will be dependent on innovations and disruptions. New companies in the segment will have to find solutions for local problems through their expertise. System integrators and creative business models will have to evolve locally. The back offices of several MNCs need to be augmented with local operations for increasing T&M revenues.

Murtuza Kachwala

Test equipment companies have faced challenges in attempting to improve test capabilities and reducing testing time because of the excessive pricing pressure exerted by operators. T&M products typically require high capital investment and these costs escalate further as the equipment needs to undergo constant upgradation, given the rapidly changing wireless technology environment. Cost escalation also occurs when drive testers fail because invalidated

data is collected and several testing processes need to be redone. Another challenge that test equipment vendors usually face is the successful provision of a testing solution that is suited to the skills and capabilities of end-users. Most companies lack the specialised labour needed to achieve this objective. While the deployment of LTE offers significant opportunities for the T&M market, there are major challenges that need to be overcome in order to fully exploit the market potential. Compared to the legacy networks, LTE technology offers greater speeds and higher spectral efficiency. Consequently, testing the components of a 4G network requires more comprehensive test coverage of radio frequency, protocol and system-level elements, including base stations, handsets and network infrastructure.

What is your outlook for the Indian telecom T&M industry?

Rahul Agarwal

The introduction of next-generation technologies like 4G, IoT and 5G will create opportunities for the entire ecosystem going forward. The growing demand for bandwidth, multiple devices and increasingly complex network architecture will continue fuelling growth in the T&M market. With reduced hardware costs, lower data tariffs and ease of integration with platform-based services, wider adoption of M2M communications is expected shortly. It is necessary to have efficient T&M systems capable of integrating data with different formats because without them, testing costs will remain almost as high as equipment manufacturing costs.

Vishnu Goel

Telecom T&M is approximately 25-30 per cent of the total T&M industry and in the next two years, it can possibly grow to around 40 per cent. The key driving factors would be the explosion in telecom and data services in the aerospace/defence sector. The sector may witness the emergence of specialised companies and also consolidation. This will segregate pure-play hardware and T&M system companies.

Murtuza Kachwala

There are tremendous opportunities for test equipment vendors as we are now shifting to IP/Ethernet technologies. With the introduction of next-generation technologies and the need for service providers to ensure superior QoS, the segment will increasingly gain significance. In the next few years, the T&M segment will evolve more rapidly, with newer standards of deployment and testing, iPv6-driven testing and increased data usage. As the focus is continuously shifting to smartphone applications, T&M providers need to demonstrate continuous innovations and thought leadership to sustain themselves in the Indian market. They will become a driving factor in the definition of new standards, partnering with network operators to help them comply with government regulations. The quality assurance of real-time applications and expert knowledge in big data and network security are likely to define the road ahead for this segment.

In recent months, the government has adopted a strict stance on the testing and certification of telecom equipment. It is planning to set up labs and testing centres which will go a long way in addressing the problems faced by operators while simultaneously opening up new opportunities for T&M players in the country.

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