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Complete Telecom Products "Made in India"?

A Knowledgefaber Article – Part 1 of the Series

[When India is being seen as a good telecom software product development destination, it is less known for complete telecom products that are a result of hardware, middleware and software. Where are we right now? and how should we participate in the global telecom opportunity if we were to make India a true "innovation" destination]

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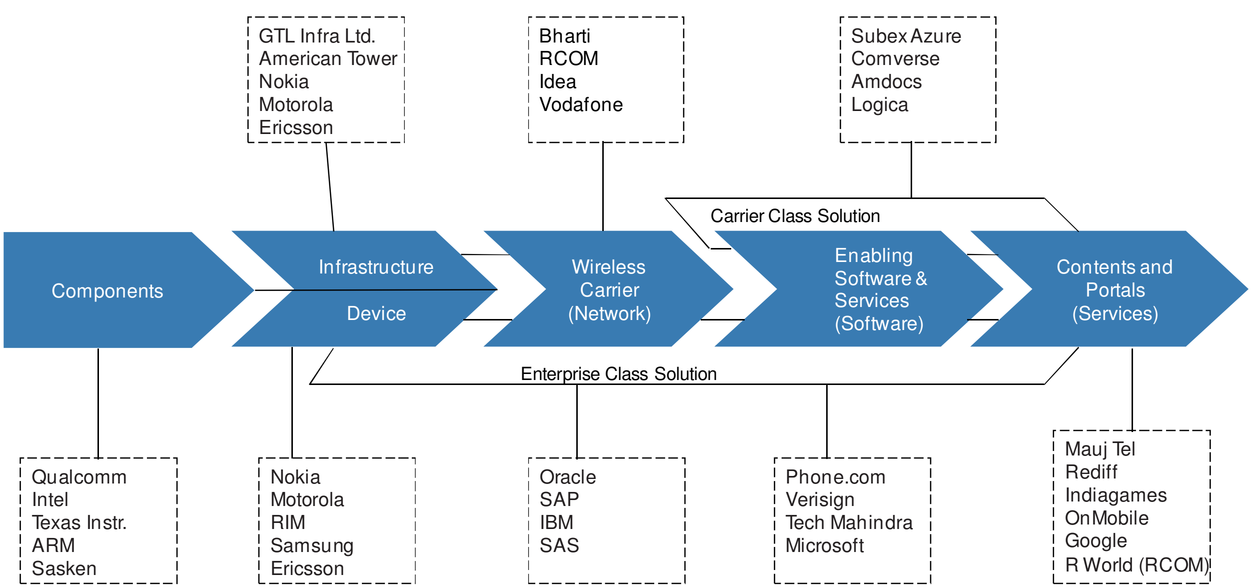
29/09/2009

In the last few years market place is abuzz about India as an emerging destination for R&D due to availability of quality talent, people with knowledge of product development process moving back to India, cost arbitrage, MNC R&D centers and several other advantages. While this holds true for “offshored R&D functions” and for “software products” to a great extent but not beyond that. Not so much in the non-software domains and certainly not by the Indian companies in the non-software areas such as complete products. While there is some amount of work happening on the non-software front but it is limited to a few players and/or few areas if at all. For any country to be termed as a R&D hub it needs to have companies working on “complete product” development with several homegrown product companies/technologies. Add to it an R&D ecosystem that needs to be resourceful and agile. India is at par with the world when it comes to emerging technologies and products development in the “software” field. The ecosystem for Indian software product companies & start ups has evolved significantly during this decade. However telecom industry in India, even though with one of the largest and fastest growing subscriber base, is far behind in terms of development of the core products (including hardware) around wireless/wireline technologies or other products compared to peers like China which has several homegrown technologies (such as TD-SCDMA) and product companies such as ZTE and Huawei, etc. Leave aside emerging technology areas such as 3G, 4G, WCDMA, LTE, HSDPA, IPTV, etc.

In order to understand this aspect in greater detail let us take the case of wireless services value chain[1] in telecom.

Value chain of wireless (mobile) telecom



Source: Knowledgefaber

Components – Some of the leading companies in the component space in world include Qualcomm, Intel, Texas Instrument, ARM, AMD, etc. and some of their products includes Chipsets, microcontrollers, and several others. All of them have presence in India in terms of development centers and other functions. India lacks the presence of homegrown companies in the component space and it is dominated by the presence of foreign players. However IT services firms like Wipro, Sasken and other IT consulting vendors have provided R&D services to telecom product companies in the component space with work ranging from low-end to high end services:

- Testing of various components and products
- Development, e.g., 7K chipset Series Boards for Qualcomm
- Large part of product development of almost complete routers, switches and mobile phones for leading telecom companies
- Others

India does not also have any large homegrown ODM (Original Design Manufacturer) company that can support telecom companies and OEMs. MNC's who have ODM/EMS operation in India include Flextronics, Jabil Circuit, Celestica, Elcoteq, Solectron, Hon Hai Precision Industry, Sanmina-SCI, D-Link etc. Contrasting trend can be found in countries like Taiwan and China have large domestic companies in the ODM space providing manufacturing/R&D services to telecom companies. Some of these companies have grown into complete product companies and formidable brands such as HTC and BenQ. Taiwan for instance has large domestic companies like Quanta, Compal Electronics, Inventec, Wistron, Lite-On Technology, BenQ and HTC in the telecom ODM space

Infrastructure/ Transmission – Infrastructure includes physical infrastructure and transmission infrastructure. Physical infrastructure (Towers, Distributed Antenna Systems, Rooftops, etc.) is not a hi-tech area and hence we are not focusing on that. On the transmission equipment (MARR systems, Multichannel Digital Equipment, Opto Electronics Equipment, Subscriber Carriage System, BTS, MSC, BSC, etc) front not many Indian companies have been able to stamp their authority on the global stage. Very few homegrown Indian companies like Tejas networks have build world class products in the telecom infrastructure space. Tejas networks has strong portfolio of Next-Generation SDH/SONET products and was credited with one of the first commercial deployment of Ethernet-Over-SDH/SONET. Other companies like VNL (Products like BTS, MSC, BSC), Kavveri Telecom (RF Components & Antennas), Coral Telecom (Wireless infrastructure equipment), Svarn Telecom (Switching Equipment) has developed innovative products in the telecom infrastructure space but these are still relatively small in size. Some of these companies are growing at a faster pace and acquiring companies around the world. Kaveri Telecom for instance has acquired four Canadian telecom companies & the recent one was Trackcom Systems International (TSI). We believe that these small companies can grow with aggressive branding/marketing initiatives and become globally competitive. China on the other hand not only has presence of homegrown companies (Huwaei, ZTE) but has also developed its own technology TD-SCDMA, which is an initiative by Chinese Academy of Telecommunications Technology (CATT), Datang and Siemens AG, in an attempt to create its own wireless technology thereby reducing its dependence on Western technology and also help developing products that can support emerging technologies.

India has over 120 telecom R&D captive centers of global telecom giants. MNC R&D centers in India are working on varied products and technologies. MNC companies like Nokia, Ericsson, Nokia Siemens, Qualcomm, Samsung, Infineon, etc. are providing high end R&D services to their parent companies. Some of the R&D work carried out by telecom captives in the telecom Infrastructure/ Transmission space includes:

- ASIC design & Hardware design
- Software development for next-generation packet-switched mobile technologies
- Wireless access solutions for mobile voice and messaging
- Product engineering development on IN product on various protocols
- Others

Nokia Siemens has plans of bringing in 3G-specific research and development projects to its facility in Bangalore. A couple of Indian institutions like C-DOT (Designing Telecommunication Switches) and C-DAC have purely focused on developing products from India but have not really made a mark in the industry.

Device – India's device (handset, customer premises equipment) space seems to see some traction but nothing on a global scale. Indian companies have not been able to capture the domestic market and MNCs still rule the roost. Some of Indian equipment makers have tried coming up with "Me Too" and "Low Cost" devices (e.g. i-Mate , XL Telecom, Karbonn, Ray, Maxx, Byond , Spice Mobile, etc.) but most of them have not been able to capture the market due to lack of R&D or QA or branding/marketing or all of these. Most of these Indian device makers are compared with no-brand Chinese products and are perceived as low cost, low quality products. Comparatively China has large domestic device manufacturers have much stronger hold on the domestic market. They spend close to 10% of their annual revenues on R&D and employ on an average 30% of their total workforce in R&D. Chinese companies are aggressively spending on developing handsets that can support emerging technologies and are customizing these devices for telecom operators to support emerging technologies such as 3G & others (W-CDMA and TD-SCDMA). Some of them have also started working on the next-gen technologies like LTE and 4G. Indian device manufacturers can take cues from Chinese makers and focus heavily on R&D, and branding efforts.

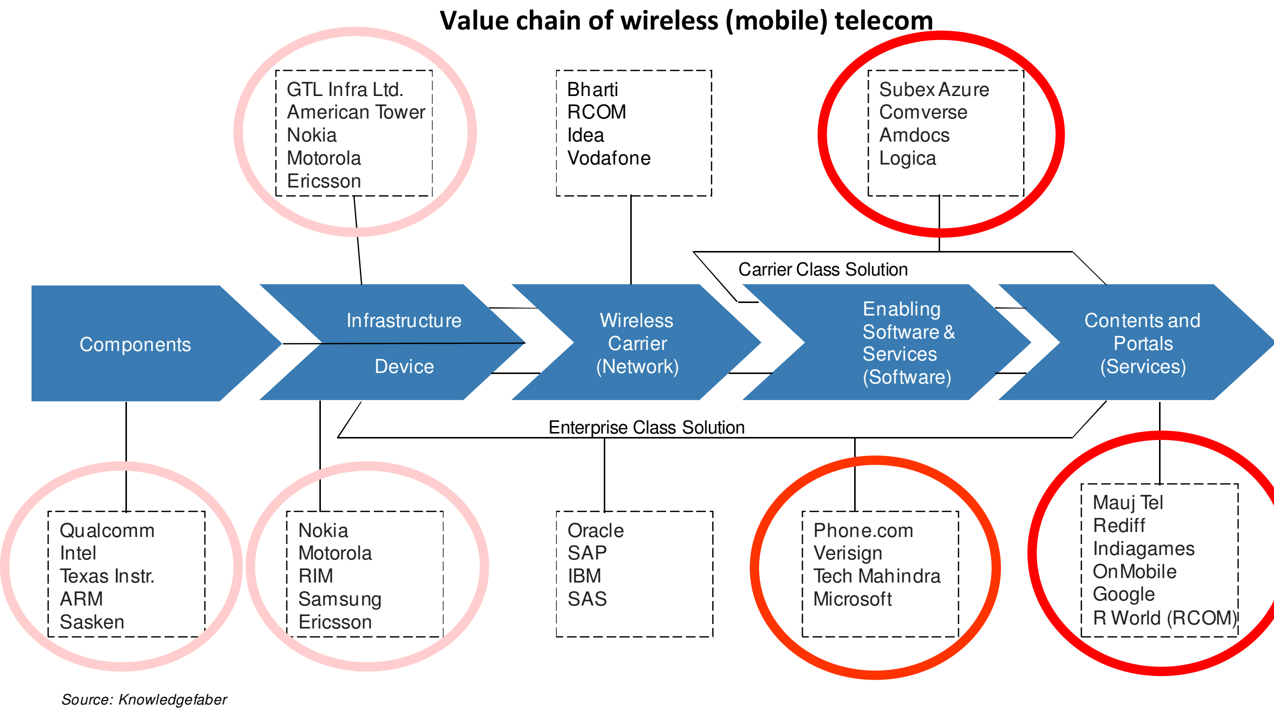
While on the other hand R&D captives of leading global device makers like Nokia, Ericsson, Samsung, Motorola etc. have used India as hub for R&D focusing on user centric technologies and developing devices that can be used in the domestic market. Nokia India R&D center is working on chipsets for high-end Nokia mobile devices and is focused on next-generation packet-switched mobile technologies and communications solutions to enhance corporate productivity. Ericsson's R&D center in India is involved in developing mobile pre-paid, convergent charging solutions and mediation products. Similarly captives are doing a lot of work from China as well. Nokia for instance is conducting R&D on a mobile infrastructure & develops mobile applications based on 3G and IP Multimedia Subsystem (IMS) for both Chinese and global markets from their Chengdu center. Motorola's China R&D Institute (MCRDI) works on value-added applications, 2G, 3G technologies and 4G (including LTE and related migration solutions).

Indian IT services firms are at the forefront of this technology space with firms like Wipro, Satyam, Infosys, HCL, Mindtree, Tech Mahindra, etc. are providing high end R&D services to telecom companies. Indian IT companies have worked with global device makers on numerous upcoming products such as Nokia on RAC (Radio Access Configuration) for managing elements of 3G networks, for development of latest set-top boxes for companies like Motorola and numerous other projects.

A couple of Indian device makers are trying really hard to compete with the global brands and coming up with products that support the emerging technologies. Micromax is one such Indian company that has come up with cheapest 3G enables device. Micromax has a development center in Gurgaon that works on building customized mobile phones for the Indian market. To complete with the global biggies in the long run and build sustainable products Micromax has plans of setting up R&D center in Shanghai at an investment of USD 10 Million by December 2009. With the establishment of new development center in China Micromax plans to reduce the development time of mobile phones. Initiatives like these from a few more Indian device makers would result in Indian device makers completing on the global stage

Wireless Carrier (Network) – Globally operators like BT, AT&T, NTT Docomo, China Telecom, Verizon and France Telecom have invested in developing technologies themselves or through technology tie ups. Indian telecom operators like Airtel, RCOM, BSNL, Vodafone, Idea, Tata Teleservices do not have a major technology focus. Indian telecom operators don't seem to be building on any expertise in the emerging technologies and this could affect them in the long run especially when it comes to next-gen technologies. Instead outsourcing is a big theme in India. Airtel has outsourced management of both their Wireline and wireless networks. Compare this to countries like Japan and China where telecom operator have focused on technologies and aggressively initiated R&D efforts. One of the Japan's leading telecom operator NTT Docomo is spending heavily on R&D of LTE and 4G technology. China's leading operator China telecom has made significant investments in the R&D space developing mobile technology, internet services and company focuses on the end customer demands and experiences. It is trying to ensure that products developed will be quickly applied to the whole network to increase the contribution of R&D to corporate operations.

Enterprise Class Solutions – This is not specific to telecom domain and hence we have not analyzed this as a part of our study



Note: Red color bubble indicates Product Development capability/innovation. Shade indicates the extent or amount of product development/innovation
Note 1: In the Indian wireless telecom market component, device, carrier class solutions space is dominated by the MNC's whereas infrastructure, wireless carrier (Network) and VAS space is dominated by the Indian players

Enabling Software & Services – Carrier Class Solutions are software products implemented at the carrier/telecom operator centralized systems. These include operational support systems (OSS) to business support systems (BSS). India has witnessed a lot of innovation when it comes to OSS and BSS software applications. Number of homegrown companies have developed cutting edge products in the OSS/BSS space that have captured market share globally. Subex Azure is one such company. Subex is globally recognized for its products and its clients including 32 of the world's 50 largest Telecommunications Service Provider. Some of the other well known OSS/BSS solution providers from India include Suntec, Bharti Telesoft (now Comviva), Aricent, Elitecore, etc. Interestingly Indian companies have been able to sell their products globally. This again indicates that India has successful product companies but only in the "telecom software space".

Content and Portal Services – India has seen tremendous growth in the Mobile Value Added Services (VAS) space in the last couple of years. Large number of Indian VAS companies have been able to come up with innovative services in mobile VAS space. Traditionally what started off from P2P SMS-based (Bollywood and Cricket) services has moved on to services like M-Search, Video Clips, M-commerce, etc. and is going from strengths to strengths. Unlike most of the other components in the value chain, homegrown Indian companies dominate the mobile VAS space. But again this is a "software space". Mobile VAS can be split into three categories i.e., Information, Entertainment and M-commerce. Indian VAS companies have done well across all these three categories. Indian VAS companies have innovated and at the same time have constantly introduced customer centric services. They have also gone global and acquired companies from around the world. Indian VAS companies like Mauj, Onmobile, Cellnext, Indiatimes, Rediff, etc. have all been able to develop innovative services and solutions. IMIMobile developed DaVinci Service Delivery Platform which integrates and encompasses all messaging platforms, voice and video platforms, operational support system (OSS), business support system (BSS), gateways, and administration and application interfaces. It has also come up with Ad-Ring fully integrated mobile advertising platform in which multi-format ad campaigns can be created and delivered to consumers via SMS, MMS, voice, WAP portal, CRBT and video streaming. Onmobile has developed VAS product & solutions ranging from contest management & aggregation, mCommerce solutions to voiceportals & voice SMS's. Other companies like Rediff developed search engine on the mobile phone and other value added services. This helped them increase their customer base & switch about 25% of the Rediff users use mobile phones for Internet usage.

Again this shows Indian companies proving their mettle in the software space but not complete products such as mobile phones and equipments.

Conclusion

India has been able to drive innovation when it comes to developing "software" products and technologies in the telecom space. But it has failed to develop complete products in the core (especially non-software technologies) in the telecom space. One of India's leading R&D service provider to global telecom companies did start as a product firm but failed due to several reasons. Now, with several years of experience in providing R&D services and gaining financial strength this is the right time for some of the large players in this field to start focusing on building a complete telecom product from India. To become a force in the global telecom space India has to create an ecosystem & build globally competitive product companies across the telecom value chain from component, infrastructure to devices. The table below showcases the difference between the telecom hardware equipment and telecom software company sizes. The telecom hardware equipment market is much bigger than the telecom software market. To stamp its authority in the global telecom market India needs to build globally competitive companies across telecom value chain. If you do a comparison of Global Telecom Equipment Market VS. Telecom Software Market (In USD Billions) you will see that Global Telecom Equipment Market is about $319 B while Global Telecom Software Market is just $ 20.8 B. For the above figures the definitions for Telecom Equipment and Software Markets are the following. Telecom Equipment includes communication equipment and products. Note the market value is based on end-user spending on telecommunication equipment except in the case of networking equipment where manufacturers selling price (MSP) is used. Telecom Software Market includes Billing, CRM, Service Fulfillment, Service Assurance, NEM, SDP & Middleware

Recommendations

Infrastructure and government support – Central or state government would have to take various measures for promoting hardware product development. They would have to invest heavily on infrastructure and provide financial assistance to promote entrepreneurship in the hardware product space. Taiwan is a classic example of this, government spent heavily on building infrastructure and ecosystem for developing hardware industry. Taiwan built “Hsinchu Science Park” a hub for worlds ODM, semiconductor and IT companies. Japan’s international trade agency MITI (Ministry of International Trade and Industry) and Karnataka government has taken the initiative to boost hardware product development.

VC Funding – This is increasingly happening in the software product development space in India.Similarly for complete products VC funds focusing on hardware product development would also be required. It would encourage startup companies focusing on hardware product space. Government of Taiwan took pro-activeinitiatives of providing low cost bank loans and started a ‘Taiwan Venture Capital Association’ to encourage companies in this space in Taiwan

Build Risk Appetite – Indian companies haven’t looked at building product companies in the hardware space purely because the 'Cost of failure' is much higher. This is the primary reason why you see more product development happening on the software front because the cost/investment is much lower than hardware. However it is important for Indian entrepreneurs to understand that taking these risks have more chances of paying higher returns in the long run. Sloka Telecom is a classic example of Indian start up taking risk in niche space. Sloka is a pioneer in designing, developing and selling compact & cost-effective base stations. It won the Nasscom’s Innovation Awards in 2008 (awarded as the Top 8 Innovators)

Strategic Tie-Ups – Indian IT services companies like Wipro, Saksen, HCL, Satyam and many other have years of experience and expertise on high end outsourced R&D services to global telecom companies across the value chain. They have worked on several global products developed and under development from developing IP stacks, enhancing & maintaining transcoders to working on mobility management layer in 3GSM protocol stacks. Over the years they have built expertise in working on emerging telecom product lines and technologies. They have some of the best talent which is very competitive globally to build complete products. Indian IT firms can come up and work on building their own products and alsolook at the opportunity of JVs or tie ups with companies that have capabilities such as physical infrastructure, funds, product program management experience to build a globally competitive product in the telecom space.

Perhaps, there could be a platform, a combined effort of government and large Indian telecom software and services companies to start building an ecosystem for nurturing product development to compete globally in the telecom space. India has a large talent pool for complete products development that can be leveraged in creative arrangements between different companies to come up with wireless technologies, mobile devices, network elements and others.

Notes:

[1] *Part of 1 of the series – This article from Knowledgefaber focused on India's wireless space (complete products including hardware and not only software products). In the next part we would be looking at the wireline space. We would be covering companies in the fixed wireline, audio/video conferencing, structured cabling, network storage, broadband equipments, modems, upcoming technologies such as IPTV, etc*