“The Electronics Industry In India” December, 2014

Preeti Lal
Student, 4th Semester, B.Tech – Ece, Vit University

1. THE ELECTRONICS INDUSTRY

1.1 GENESIS OF THE ELECTRONICS INDUSTRY

Electronics is one of the largest and also the fastest growing industry globally. For the past 30 years, this sector has grown faster than any other industrial sector in the world. Its growth and success has been associated with various factors, primarily the rising demand for electronic products, frequent introduction of new technologies and ideas for products, opening of new and developed markets, and increasing penetration in the economy. Electronics is emerging as such a giant industry, going higher day by day, that it is creating a leveraging effect on the industrial base of our country. In fact the level of competitiveness of an industry is measured by its ability to incorporate electronics.

Public sector plants in various new locations in India started operating around 1970s. The government encouraged the states to establish electronics development corporations. These have been helping the promotion and development of electronics in their respective states. Their work is to provide special incentives like sales tax concessions, creation of separate industrial areas for the industry, giving subsidies for the setting up of units in rural and backward areas, financial participation (public or assisted). All this in the past years has encouraged the emergence of several secondary electronics centres.

Up to 1971, the electronics industry had developed in the following sectors: Bangalore, Mumbai, Pune and Delhi. Bangalore was the hub of major public sector corporations in Defence and Telecommunication. Mumbai and Pune were areas of private sectors, mainly foreign owned firms of the late forties to fifties. Delhi became an emergent of small scale industries in the sixties.

During 1980 government adopted the strategy for development of electronics industry to seek the following objectives:

- Maximize the enormous resource which its huge domestic market constitutes
- Maximize electronic production
- Achieve technological self-reliance
- Use technical and industrial capacity to build for domestic needs and then increase exports
- Maximize the dispersal of electronics industry across the nation (diffusing skills, employment production and marketing)
- Develop an electronics industry which collaborates with various sectors also (agro transport etc)

1.2 GOALS SET BY THE DEPARTMENT OF ELECTRONICS DURING THE SEVENTH FIVE YEAR PLAN (1985-1990)

Considering the enormous potential of the electronics industry in India, the Department of Electronics set the following major goals during the seventh five year plan:

1. Increase from Rs. 20800/- million in 1984-85 to Rs. 100000/- million in 1989-90.
2. Attain economies of scale to international levels of relevance, capacity and size.
3. Provide extra thrust on usage and industry promotion activities of the department.
4. Increase the growth of computer software industry of both application as well as exports.
5. Production of consumer electronics goods at reasonable prices.
6. Production of electronics components and materials at economic scale of production.
7. Development of manpower and promotion of data and information flow through Govt. Supported programs.
1.3 PRESENT & FUTURE OF ELECTRONICS INDUSTRY IN INDIA

Electronic industry started its journey around 1965 and took a giant step later on. It was the age of radios, monochromatic television sets, Calculators, and various Audio Products. Then started the era of Colour Television. The Government took a step forward in 1982, taking an initiative to import Colour TVs sets for enabling Indians to enjoy the direct broadcast of major sporting events, Asian Games in India. This trend was quickly followed by telephones and computers.

There has been a rapid and healthy growth in the Indian Electronics Industry along with a steady increase in demand, a lucrative market of US$ 400 billion (INR 2166000 Crores) is being forecasted to be achieved by 2020. The leading sector of the Indian Electronics Industry is predicted to be consumer electronics segment. There has been an excellent growth in the Indian Electronics Industry from INR 1.4 trillion (2007-2008) to INR 79.48 billion (2011-2012). The Electronics Industry here mainly manufactures and exports components for foreign companies.

The total demand of global electronics hardware production (2012) is US$ 1.7 trillion (INR 92,05,500 Crores) and Indian electronic industry caters to only 1.3% of this huge global demand. Indian Consumer Electronics industry is now worth INR 340 billion and caters to the global demand exporting components for Display Technologies, Entertainment Electronics, Optical Storage Device, Passive Components, Electro-mechanical components, Telecom Equipments, Transmission & Signalling Equipments, Semiconductor Designing and Electronic Manufacturing Services.

In such backdrop, India proves to be a flourishing market for mobile phones. Every month, around 2 million Indians start using mobile phones. Telecom Industry is entering the Indian Electronic Industry at a rate of 10%. Other than Telecom, Auto Electronics, Consumer Electronics, Industrial Electronics and Medical Electronics sectors are also showing high and steady growth. The present Indian electronics industry market and the growth keep alluring the global players.

Companies like Solectron, Flextronics, Jabil, Nokia, Elcoteq have come forward to invest in Indian market. Even Korean Electronics Giants like LG & Samsung have committed to establish manufacturing facilities in Indian territory.

One most crucial and significant reason for the internationally acclaimed player to get interested to start manufacturing plants in India is the Human Resource. India is saturated with highly educated and unemployed human resources. Both skilled and unskilled employees are waiting to get an opportunity to grab on. Labour cost for manufacturing electronics goods and services in India is about 30 to 40% cheaper than the same in US or Western Europe.

1.4 GROWTH DRIVERS

The robust growth of India’s electronics industry is attributed to multitude factors including the following:-

- The constantly growing middle class.
- Increasing disposable incomes and declining prices of electronics
- Government initiatives –
- Apart from the various schemes to uplift this sector, government has been implementing the usage of latest technology for work. Be it laptops to students in school, or identification process or connectivity in rural areas, government is on a roll for improving the the electronics sector.
- Adoption of high-end technology devices-
- Introduction of smart phones, smart TVs, 3D TVs, RFID technology, smart books, tablets etc.
- Rollout of 3G/LTE networks-
- The telecom sector is currently experiencing the boom, with the speedily increasing 3G subscriber base.
- Also, AIRTEL has also started providing 4G networks in a few states including Bangalore and Pune.
- Low penetration in rural area
- This provides a huge potential market.
2. CONSUMER ELECTRONICS

2.1 FOREWORD
Ever since the late 80s, the demands in Consumer Electronics have been rising. The electronics production of Rs. 3388 millions in 1983 increased to Rs.44000 millions during 1994. New and improved techniques in manufacturing were introduced, globalisation of scientific and technical innovation occurred hence improving the industry’s economy. As a result of increase in demand of Consumer Electronics the government formulated many policies which lead to creation of more demand within our own country as well as developing and developed countries. This has resulted in steep rise in the growth of electronics industry.

2.2 CURRENT SCENARIO
As per statistics of 2013, the total consumer electronics market stands at $5,926.9m which mainly consists of sale of Audio Visual equipment and gaming console products designed primarily for domestic use. The Audio Visual equipment comprises of CD players, DVD players/ Recorders, hi-fi systems, home theatres, in-car entertainment systems, portable digital audio, radios, televisions and video recorders. The gaming consoles segment includes both home use and portable consoles. The market is valued at retail selling price (RSP) with any currency conversions calculated using constant 2013 annual average exchange rates.

A major growth booster in this industry is the sharply increasing demand for electronic components and devices for smart phones and tablets. The Smartphone and tablet market has so expanded, that along with itself, it has accelerated the volume of data traffic, hence developing high speed communication networks. The ever increasing youth population and improving middle class is resulting in the rapid increase in consumer electronics in the emerging economies.

There has been a strong growth in the Indian Electronic Market since 2010. In the Asia-Pacific regions, India accounts for 8.8% of consumer electronics market and ranks third after China (59.8%) and Japan (14%).

2.3 MAJOR FACTORS BOOSTING THE INDUSTRY
• Progressively Growing consuming class (defined as people having annual income of US$ 980 (INR 45000 or above) that has greater disposable income and propensity to spend. It has been estimated that this group constitutes over 80 per cent of the population of India (2009-10)
• Lifestyle changes such as greater exposure to global trends and increasing affinity for convenience and lifestyle products
• Emergence of nuclear double income families, increasing urbanization,
• Low penetration levels of most consumer durables. For example, in 2002, only 66 per cent of middle-income households had a TV set, only 28 per cent of the urban households possessed a refrigerator, while just a little over 15 per cent owned an air cooler. Despite a population of more than 1 billion people, only 16 million computers were used in India in March 2005. Such a scenario gives a huge scope of development.
• Increased government and private industry spending on sectors such as defence and aerospace. The Indian aviation sector, for example, has placed orders for more than 350 aircrafts with a list price of about US$ 26 billion. • In recognition of India’s domestic market potential, Samsung has selected India as one of the top six strategic markets in the world along with the US, China, Russia, Germany and Thailand.

2.4 STATISTICS (2013)
The Indian consumer electronics market had total revenues of $5,926.9 million in 2013, representing a compound annual growth rate (CAGR) of 11.2% between 2009 and 2013. In comparison, the Chinese market increased with a CAGR of 6.6%, and the Japanese market declined with a compound annual rate of change (CARC) of -19.1%, over the same period, to reach respective values of $40,171.0 million and $9,395.5 million in 2013.
Audio visual equipment segment has been the most lucrative in the 2013 market. Its total revenue was $5,873.1 million which is equivalent to markets 99.1% value. The rest 0.9% was contributed by gaming consoles with revenue of $53.7 million.

<table>
<thead>
<tr>
<th>Year</th>
<th>$ million</th>
<th>Rs. million</th>
<th>€ million</th>
<th>% Growth</th>
</tr>
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<tr>
<td>2009</td>
<td>3,874.2</td>
<td>226,585.6</td>
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<tr>
<td>2010</td>
<td>4,272.6</td>
<td>249,886.7</td>
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<tr>
<td>2011</td>
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<td>274,338.6</td>
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<tr>
<td>2012</td>
<td>5,394.3</td>
<td>315,490.5</td>
<td>4,056.8</td>
<td>15.0%</td>
</tr>
<tr>
<td>2013</td>
<td>5,926.9</td>
<td>346,636.2</td>
<td>4,457.4</td>
<td>9.9%</td>
</tr>
</tbody>
</table>

CAGR: 2009–13  
11.2%

These images show the year wise market and growth of the consumer electronics industry in India.

2.5 FORECAST
The CAGR (compound annual growth rate) is being predicted to decelerate to 9.2% for the five year period of 2013-2018, and the market is predicted to reach $9,186.6 million by the end of 2018, which will be a 55% increase since 2013.

The following table shows the year-wise market and growth predictions:
2.6 ANALYSIS

In India, the electronics sector, especially the Consumer Electronics subdivision is enjoying a favourable boom in the market. The market is increasing, but the Compound Annual Growth Rate (CAGR) is decelerating. A lot of factors result in the ups and downs of an industry. Henceforth is the Five Force analysis of the Electronic Industry in India

THE FIVE FORCE ANALYSIS

Here, in the analysis done by the Five Force method, the consumer electronics market will be analysed taking non-diversified retailers specialising in consumer electronics sector as “players”. The buyers are taken as “consumers”, and consumer electronics manufacturers as the “key suppliers”.

For this analysis, we have five criteria:

- Buyer power
- Supplier power
- Substitutes
- Degree of rivalry
- New entrants

1) BUYER POWER (MODERATE)

As the impact on a retailer of losing any particular customer is nominal, buyer power is correspondingly weakened.

It is extremely difficult for the players to differentiate themselves from the others. To attract customers is a hard job because the products released by various companies in the markets are more or less similar. Except for the high end retailers such as Apple or Samsung, most retailers sell the things with same configurations, and more or less same facilities.

The only thing that differentiates products and players is the price sensitivity and the customer service. And supporting that fact, the switching costs in this industry is pretty low. The average common man needs affordable electronics at par to his salary. Apart from that, players providing good service and after sale benefits will have more customers. At times, the success of a company is associated to its employee turnover rate (number of employees leaving in a given frame of time), which is (if) low, assures growth as experienced employees will know how to satisfy the customer.

So basically, apart from a very few points, the power lies in the hands of the customer.

2) SUPPLIER POWER (MODERATE)

When a supplier has minimal loss on losing a customer, he is said to have strong supplier power.

It rarely happens that retailers are integrating backwards into manufacturing, but some manufacturers like the previously mentioned LG and Samsung, run high street retail chains to market their own

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<tr>
<td>2014</td>
<td>6,252.8</td>
<td>365,703.3</td>
<td>4,702.5</td>
<td>5.5%</td>
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<tr>
<td>2015</td>
<td>6,968.0</td>
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<td>2016</td>
<td>7,645.1</td>
<td>447,132.1</td>
<td>5,740.6</td>
<td>9.7%</td>
</tr>
<tr>
<td>2017</td>
<td>8,384.6</td>
<td>490,301.3</td>
<td>6,305.7</td>
<td>9.7%</td>
</tr>
<tr>
<td>2018</td>
<td>9,186.6</td>
<td>537,294.2</td>
<td>6,908.8</td>
<td>9.6%</td>
</tr>
</tbody>
</table>

CAGR: 2013–18

9.2%
products exclusively. However, it is unlikely that manufacturers would ever extend themselves so far into direct-to-consumer business that the pure retailers became unimportant for their sales. Many companies small or large, soon replicate new ideas or products as their own cheaper versions (e.g.: various cheaper versions of iPod) so there is no monopoly for electronic goods. Patent holders receive royalty for their ideas and innovations but that weakens the supplier power.

3) NEW ENTERANTS (MODERATE)
Switching costs in this industry are low. The electronics retail market is labour intensive, however, the skilled customer facing personnel are not difficult to employ because of availability of plenty of such resources. This facilitates good start by the new entrants
So beginning with a good start is easily done by new entrants. But, on the other hand, competing directly, with leading incumbents, such as Next Retail, would definitely call for more resources, in order to lease stores, build supply chains, and advertise the newcomer.
Great benefit would be attained by large incumbents as they constantly push their per-unit costs down. Adding to this, central administrative costs may not rise as quickly as revenue as the number or size of shops rises, and the cost of implementing an online retailing service may be easier for a large company to absorb, which would again be a big competition for the new comer.
Overall, there is a strong risk of new entrants, but this will be more significant in rapidly-expanding segments than in more slow growing economies. (Example: developed nations)

4) THREAT OF SUBSTITUTE (STRONG)
By substitutes, it is meant the broader range of consumer electronics, for example laptops have substituted computers and now tablets are substituting laptops too.
Retailers that specialize in specific products may find their revenues threatened but players who offer wide range of electronics might not. The players who do not stick to one product, but supply a wide range of brands as well as products will not succumb in the pressure of new substitutes.
A second form of substitute is alternative distribution channels (online retailers and shops). Recently, the trend of online shopping has reached new heights as consumers find it easy and reasonable. Hence online retailing is a great threat to all brick and mortar retailers.
Apart from that, retailers often compete with local supermarkets or departmental stores for the issue of price sensitivity through the use of private labelled goods. These retailers provide discounts in various items hence becoming famous in the customers.

5) DEGREE OF RIVALRY (STRONG)
Differentiating themselves from each other is extremely hard for retailers and on top of that, the costs of switching are extremely minimal. As a result it is easy for customers to move from one retailer to another and this results in heightened rivalry.
Further, this market is fairly easy to exit, which also eases competitive pressures. As the market grows, there is high probability of the rivalry to ease out. This is the case in India, where the market has been growing strongly within the last few years. So there is hope for easing rivalry.

2.7 EXAMPLE OF LEADING COMPANIES
2.7.1 AMAZON
Amazon is an online retailer. The company offers a wide range of products and services through its trademark e-commerce site, amazon.com. The products offered by the company include merchandise purchased for resale from vendors and products offered by third party sellers. The company also manufactures and sells the Kindle devices.

Amazon is an online retailer which caters to wide range of electronics products to customers. It functions through its trademark e-commerce site, amazon.com. The company offers electronics merchandise purchased for resale from vendors and products offered by third party sellers. Amazon also manufactures and sells the Kindle devices.
The company sells a wide variety of products including books, DVD’s/Blu-Ray, consumer electronics, home appliances, garden products and toys amongst others.

The company caters to four primary customer sets: consumers, sellers, enterprises and content creators.

The company serves consumers through its retail websites. Amazon designed its websites to enable the sale of millions of unique products; some of these products are sold by Amazon, while the others are sold by third party vendors. The company offers merchandise at the lowest possible prices by adopting everyday low product pricing strategy and through shipping offers.

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2.7.2 CROMA
It is one of the biggest retail chains in India dealing primarily with consumer electronic good of various leading brands. It is a Rs.3000 Crores Company. It provides various consumer electronics goods ranging from mobile phones, Televisions, computers, laptops, tablets, Audio-Visual equipments such as head phones, music players, ipods, radios, Kitchen appliances, Washing machines, VCR players, Cameras, security systems, electronics toys, gaming consoles, Play stations, Xboxes, and many more such appliances. It has its own brand produced electronic products too, e.g.: croma tablets.

Croma has a little over hundred stores overall India in almost all major cities. It also provides online retailing services. A revenue of about Rs. 250 Crores was generated for 2013. Comparing to Rs. 80 Crores in 2011-12 and Rs.130 Crores in 2012, Croma is growing at a good rate.

2.7.3 RELIANCE
Reliance Industries Ltd. Is one of the largest company in the private sector in India. It has opened a subsidiary company named Reliance Digital which has plans to increase the entrepreneurship in the consumer electronics sector.

It caters to various brands and products. It has over 600 stores covering major cities throughout the country. Reliance digital grew at 76% with revenues of Rs.61 Crores (2013).Overall, Reliance retails grew at CAGR 33% over 2011-2012 achieving revenues of Rs. 10,800 Crores. Since it is having an extremely strong backbone in the form of Reliance brand which fuels its success.

3. ELECTRONICS MANUFACTURING SECTOR
Indian electronics industry can be broadly classified into six main verticals of
- Consumer electronics
- Industrial electronics
- Strategic electronics
- Computers
- Communication & broadcast equipment
- Electronics components.
The ESDM (Electronic System Design & Manufacturing) industry in India constitutes the following sub-segments:

- Electronic products
- Electronic components
- Semiconductor design
- Electronic manufacturing services

- Electronic products: electronic products (produced locally or imported) for domestic consumption in India as well as export of electronic products manufactured in the country, both of these are constituted for the total market. The consumption as well as exports in this sector have been constantly rising at faster pace hence improving the industry.
- Electronic components: These include revenues generated from local manufacturing of electronic components.
- Semiconductor design: revenues generated by the semiconductor design-related activities of local players and captives of semiconductor Multi National Corporations operating in India are included here along with embedded software, VLSI and hardware/board design.
- Electronics Manufacturing Services: revenues generated by EMS services delivered from the country are included here.

3.1 FOREWORD

Historically, Indian Electronics Industry has been enjoying excellent growth. Even the slowing economic environment could not push the electronic industry down in any of its major segments. It has been noticed in the past that the Indian electronic industry has been attracting global attention because of high quality production at lower cost as compared to the western counterparts. Foreign companies sense vast opportunities leading to their setting up production base in India. Presence of vast opportunities here has led the companies to set their production base in India.

India is well-known for its software prowess. But on the hardware front, the progress is rather slow. In 2013 it imported $33.5 billion worth of electronics, from semiconductors to smart phones. That’s more than it spent on any imports except oil and gold. With India’s large and growing middle class buying more digital devices, the dependence on imported semiconductors and other hardware is obviously going to increase. The bottom line is that we need to develop a domestic chip industry.

Electronic Industry in India mainly produces goods that have low value addition and is primarily focused on last mile assembly. The gap that has been created due to ever increasing demand in electronics and lack of electronic manufacturing supply creates opportunities for Electronics Manufacturing Services to meet this growing gap and progress in the Indian market.

The average income of India is just about decent, which leads to the fact that price sensitivity is a key factor for any customer. In order to provide comfortably priced products as per the common man’s requirement, we need to increase the domestic manufacturing of electronics component manifolds and make it more feasible than importing the components. i.e. reducing the various factors that favour importing of electronic components.

Electronic companies (globally) find India and other Asian nations extremely cost effective to manufacture their goods because the human labour source- skilled or unskilled is ample and they are waiting to grab opportunities in cheap amounts. Labour costs for conducting electronics manufacturing in India are between 30 to 40 per cent less than in the United States or in Western Europe (as mentioned previously). So all the slapping together of parts takes place in India whilst there is no significant technical progress.

Electronic companies (globally) find India and other Asian nations extremely cost effective to manufacture their goods because of presence of skilled labour force in abundance. Further the labour costs of producing electronic goods in India are between 30 to 40 per cent less than in the United States or in Western Europe (as mentioned previously). So all the slapping together of parts takes place in India whilst there is no significant technical progress.
3.2 STATISTICS

Indian Electronic Hardware Industry has a production of USD 1,750 billion which is about 2% of the global electronics hardware industry. The domestic consumption in India is higher than production hence leading to a supply-demand gap. Due to this, this industry provides exciting opportunity for companies interested in the hardware sector.

Salient features of the electronic manufacturing sector are as follows:

- The electronic products segment forms the largest portion of India’s ESDM market. It has an estimated 79% market share, the Semiconductor design forms 15% of the market share, while electronic components and EMS services form a very small portion with revenue contribution of 5% and 1%, respectively as on 2012.
- Revenue generated by Electronics Manufacturing Services (EMS) providers and Original Design Manufacturers (ODMs) in India has expanded to $2.03 billion in 2009, rising at a CAGR of 21 per cent from $774 million in 2004. Indian EMS/ODM revenue grew by 20.8 per cent to reach $935 million in 2005.
- EMS market revenue is estimated to have been around $3.00 billion in 2011, growing by 24.0 per cent since 2010.
- The size of the EMS market will reach $10.67 billion in 2016 growing at a CAGR of 28.8 per cent from 2011 to 2016 forecast period.
- Production value of electronics hardware in rupee terms is estimated at Rs 2,130 Billion in FY 2014, registering a CAGR of 20% over the period FY 2010-14.
- Market size of the electronic hardware industry in India is estimated to have grown from USD 45 Billion in FY 2009 to USD 107.8 Billion during FY 2014, registering a CAGR growth of 19%, whereas production during same period grew by a CAGR of 17 %.
- India continued to remain a net importer of electronics goods during FY 2010-14 with estimated net import of ~Rs. 1,410.40 Billion for FY 2014. There is a huge demand-supply gap that is catered by imports, which provides great opportunity for the domestic manufacturers.
- The Indian electronics industry is expected to reach $400.00 billion in 2020 and the endemic manufacturing capacity for electronic products by 2020 will only be $100.00 billion.
- Although India’s ESDM market is growing at a robust rate, most of the demand is being met through imports. The domestic ESDM market is expected to reach US$94.2 billion in 2015 from US$68.3 billion in 2012. However, domestic production and services in the industry far lags behind the demand, with revenues from domestic production estimated at US$29.8 billion in 2012 and forecasted to reach US$42.4 billion in 2015.
- In spite of impressive growth in the ESDM market in India, most of the demands are met through imports. The domestic ESDM market is expected to reach US$94.2 billion in 2015 from US$68.3 billion in 2012. However, domestic production and services in the industry far lags behind the demand, with revenues from domestic production estimated at US$29.8 billion in 2012 and forecasted to reach US$42.4 billion in 2015.
Going forward, the Government estimates the demand for electronics to increase to US$400 billion by 2020, while the production will grow to around US$100 billion by the same year. This is an alarming situation for the country, because growing at this rate, the electronics import bill is expected to far exceed the oil import costs by 2020 and result in a major balance of payments crisis. The resulting gap of $300.00 billion will have to be imported.

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As per the latest estimate, the demand for electronic products in India is expected to increase to US$400 billion by 2020, while the production will only grow to around US$100 billion by the same year. The resulting gap of $300.00 billion will have to be imported. This is an alarming situation for the country, because growing at this rate, the electronics import bill is expected to far exceed the oil import costs by 2020 and result in a major balance of payments crisis. The resulting gap of $300.00 billion will have to be imported.

Reaching US$400 billion in market size by 2020 is the true potential of India’s ESDM industry. However, if supply-side measures on promoting local manufacturing are not implemented, this could result in reduced demand with the INR adjusting itself, and result in the country’s aspiring class not being able to afford electronics and the associated benefits of transparency and productivity. It would also adversely affect India’s per capita GDP growth, since domestic consumption of electronics is correlated to the per-capita income of economies.

In 2012, the domestic consumption increased by 6.2% y-o-y, but the exports declined by 9.5% y-o-y, resulting in a low overall growth rate of the market. Domestic consumptions are likely to increase at a CAGR of 10.6% to reach US$64.9 billion in 2015, while exports are expected to
be as close to negligible, growing at a CAGR of 1.1% to reach US$9.7 billion in 2015. Figure below depicts the electronic products segment market.

- Considering that EMS market which services the electronics market is still young and evolving, it may not be able to fulfill the huge demand of the Electronics Industry of India. But despite of lacking in domestic supplies, the product markets served by EMS in their respective segments show high revenue and growth rates, especially the telecom and consumer goods. In spite of all this growth, limited reverse engineering has slowed down the progress in offering design solutions.

INCREASING DEMAND FOR ELECTRONIC PRODUCTS
With increasing competition and availability of choices, the prices of products have come down, thus benefitting the consumer in return. This has led to increasing need for improving the electronics manufacturing ecosystem in India. The other contributing factors for the increasing electronics demand are:
- Manifold increase in income levels of people
- Changing purchasing behaviour
- Aspirations to own high-end, branded, and technologically advanced products

3.3 SEMICONDUCTOR INDUSTRY
Revenue generated by India’s semiconductor design industry was expected to amount to US$10.6 billion in 2012, growing at a CAGR of 17.3% from 2009 to 2012. Increasing availability of a capable talent pool, coupled with the emergence of India as an important consumer market for electronic goods, has led to a significant increase in design work executed in the country. India’s Semiconductor Design Industry generated revenue of around US$ 10.6 billion in 2012, growing at a CAGR of 17.3% from 2009 to 2012. India has an availability of an extremely talented manpower, which along with the fact that India is emerging as an important consumer market for electronic goods, has led to a great deal of increase in design work executed in the industry.

Embedded software development is the frontrunner in terms of its contribution to the Indian semiconductor industry’s revenues (81.1%). VLSI design contributed around 12.6% of its overall revenues and hardware/board design the remaining 6.3% in 2012. Figure 13 below provides details of the revenues of the domestic semiconductor design industry. Embedded software development is a very competitive sector which is likely to soar in coming years in terms of its contribution to the Indian semiconductor industry’s revenues. In it contributed 81.1% of total revenues, VLSI (Very Large Scale Integration). Design contributed around 12.6% of its overall revenues and hardware/board design the remaining 6.3%. The figure below shows the revenues over the years 2009-2012.

3.4 GROWTH DRIVERS
This sector has shown a measurable growth in the previous years, and due to its exposure the semiconductor industry in India has matured to decent levels. But still, there is a huge prospect of reaching new heights in the future. The following major reasons are a hope for development in this sector:
• Semiconductor design companies are now executing a growing number of projects in chip developments as compared to derivative chip design previously done in the country. These companies are working on complex designs in parallel to new developing technology.
• India has a humongous talent pool. Every year, more than ten lakh students enrol for engineering courses. The government has been focusing on improving access to higher education as well as increasing number of colleges and institutions in the country. The total engineering headcount in the VLSI, board design and embedded software segments have reached around 234,000 in 2012.
• Although cost structures are gradually rising in India at an absolute level, the country still has a considerably significant overall cost advantage as compared to the US, Europe or Japan. Hence we have a benefit of cost competitiveness.
• There is proximity to growing APAC customers Semiconductor design companies in India are receiving an increased amount of design work because the country is close in terms of distance and time zone differences for Asia-Pacific customers.

3.5 STEPS TAKEN BY THE GOVERNMENT
The Government has identified growth of electronics hardware manufacturing sector as a progressive area and has taken various initiatives to promote the industry. Some of the key initiatives introduced by government are Digital India in 2014, revamped NeGP 2.0 i.e e-Kranti and Meghraj which aims to harness new emerging Social, Mobility, Analytics and Cloud (SMAC) technology on for optimisation of ICT spending and services delivery mechanism on electronic platform.
National Electronic Policy with its two key schemes i.e Electronic System Design & Manufacturing (ESDM) and Modified Special Incentive Package Scheme (M-SIPS) aim to strengthen domestic electronic manufacturing industry in India.
As the demand for electronic products is at an all-time high, the import bill has shot up to meet the demand. Predicting a demand-supply gap of $300 billion in 2020, the Indian government has taken steps to invest $100 billion in the electronics manufacturing industry.

3.5.1 NATIONAL POLICY ON ELECTRONICS 2012
Was aimed to create a globally competitive electronics design and manufacturing industry to meet the country’s needs and serve the international market. Its objectives are:
• To create an eco-system for a globally competitive ESDM sector in the country to achieve a turnover of about USD 400 Billion by 2020 involving investment of about USD100 Billion and employment to around 28 Million people at various levels.
• To build a strong supply chain of raw materials, parts and electronic components to raise the indigenous availability from the present 20-25% to over 60% by 2020.
• To facilitate cost effective financing and funding support for setting up ESDM units in identified areas.

3.5.2 MODIFIED SPECIAL INCENTIVE PACKAGE SCHEME (M-SIPS)
The characteristics of this scheme are as under:
• Indian Government has decided to offer a package of incentives to attract domestic and global investments into the ESDM sector within EMCs to provide a level playing field and overcome disabilities faced by manufacturers.
• Subsidy for investments in capital expenditure – up to 25%
• Reimbursement of CVD/ Excise Duty for capital equipment in non-SEZ units. (SEZ- Special economic zone)
• Reimbursement of Central taxes and duties for 10 years in select high tech units like Semicon fabs and ATMPs
• Incentives available for 10 years from date of approval
● Incentives applicable for entire value chain of 29 categories of identified electronics products, including raw materials, assembly, testing, packaging and accessories within these categories.
● Incentives applicable for relocation of units from abroad for state of the art technology

3.5.3 ECLINA CLUSTERS
ECLINA manufacturing clusters were started for sustainable growth. (Three ECLINA clusters till now – Rajasthan, Tamil Nadu, Andhra Pradesh). It was established in 1967 as the first industry association supporting electronics hardware manufacturing. Since then, ELCINA has established itself as an interactive forum for electronics and IT manufacturers. ELCINA actively interacts with the government and advises it on policy and business environment issues.

ELCINA focuses on promoting manufacture of:
• Electronic Components, materials, parts and assemblies
• Industrial/ professional electronics
• Defence/ strategic electronics
• Electronic Manufacturing Services
• Electronic equipment value chain for Consumer Electronics, IT/Computers, Telecom, Lighting, Auto Electronics, Medical, Electronic Design, Embedded Systems etc.
• Capital equipment and machinery for expansion of manufacturing.

ADVANTAGES OF CLUSTERS
• Increased productivity of the companies in the cluster
• Driving innovation in the industry segment
• Cutting down the unproductive costs and reduction of overall costs through shared resources
• Offers critical mass for customization of interventions
• Provide economies of scale in operation
• Better access to customers, technology, information
• Cheaper access to inputs, raw materials
• Ensures that environmental safety standards are maintained

3.5.4 MAKE IN INDIA
A campaign started by our recently appointed Prime Minister, Shri Narendra Modi, is an initiative to lure business from around the world to invest and manufacture in India. It has been launched in September, 2014 with visions to facilitate investment, foster innovation, enhance skill development, create job opportunities and to develop India’s manufacturing industry. One of the many sectors include in this campaign is electrical machinery and electronics systems.

During Indian Prime Minister’s recent visit to foreign countries like United States of America, Japan and Australia he successfully campaigned before the MNCs to come to India and make their products in India and take advantages of cheap and qualified manpower and various benefits of SEZs.

Make In India has and will be introducing new policies and reforms for the benefit of respective sectors. It is exposing the Indian economy globally in order to attract various investors.

Great incentives for developing EMC clusters such as Greenfield and Brownfield are being provided. M-SIPS, SEZ are various schemes under this campaign. This campaign is giving a big push to the current electronics sector in many forms – be it investment in ESDM industry, or new innovative policies, schemes, incentives, the government is lending full support. There is huge scope for the industry to be throbbing of success and growth in the next one decade.
3.6 FORECAST

Seeing the progress of the Electronics Industry in India, and considering the fact that we are lacking behind in the manufacturing department which is leading to high level imports, the government has extended a helping hand in the form of $100.00 billion investment, to cater to the electronics demand-supply gap that would grow to $300.00 billion by 2020.

The Electronics items being produced here have very little value addition. To bring a change to that, Indian EMS companies have been gearing to become solution providers, provide hardware, software and design solutions among other countries.

Other factors impacting the forecast:
- Booming economy
- Increasing purchasing power
- Rise in demand for electronic products
- Pool of talented workforce
- Attracted attention of global OEMs for price factor

Great probabilities are lying in the forecast of the next few years. The investment of $100.00 billion will open up verticals such as medical, defence, and Aerospace, raising their market shares by great deal. Telecom, however, would still remain the highest revenue-generating segment of all.

4. APPENDIX

1.) FIVE FORCE ANALYSIS

Developed by Michael Porter (Harvard University) developed a method to analyze competition in industries for business strategy management.

![Five Force Analysis Diagram]

2.) Every day low price (EDLP)

Generally used by supermarkets and online retailers, EDLP is a pricing strategy which promises the customer low price without waiting for sale prices. Wal-Mart, Flipkart are examples of this.

3.) Reverse Engineering

Reverse engineering, also called back engineering, is the process of extracting knowledge or design information from anything man-made and re-producing it or reproducing anything based on the extracted information. The process often involves disassembling something (a mechanical device, electronic component, computer program, or biological, chemical, or organic matter) and analyzing its components and workings in detail.

4.) Backwards Integration

A form of vertical integration that involves the purchase of suppliers. Companies will pursue backward integration when it will result in improved efficiency and cost savings. For example, backward integration might cut transportation costs, improve profit margins and make the firm more competitive. Eg. A baker buys a wheat farm.
5.) SEZ

A Special Economic Zone (SEZ) is a geographical region that has economic laws that are more liberal than a country's domestic economic laws. India has specific laws for its SEZs. A lot of such zones are set up in almost all states in India. The aim for this plan is to attract foreign as well as domestic traders for setting up industries.

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