IJCRT.ORG ISSN : 2320-2882

INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

AN ANALYSIS OF PERFORMANCE AND CONTRIBUTION OF COMPUTER HARDWARE INDUSTRY IN INDIA'S GDP

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ABSTRACT

The Computer Hardware Industry allocate in India's GDP has been broadly studied. The present revision based on secondary sources. The Computer Hardware sector has witnessed the highest distribute in the total production of electronic goods in India. It also examined the trends in Indian Computer Hardware Production and Exports and share in India's GDP. The growth rate of Computer Hardware Production is the highest in the year 2014-15 i.e., 84.35 percent and the lowest growth rate is recorded in the year 2020-21 i.e.,-2.22. The contribution of Computer Hardware exports in GDP of India is increasing from the years 2011-12 to 2012-13 i.e., 0.024 percent to 0.0261 per cent, even then there are lot of variations in the share of Computer Hardware exports in GDP. The government, in an effort to support manufacture of Computer Hardware in India has altered the tariff structure significantly. It has been convenient that the IT sector is not only contributes considerably to export earnings and GDP but also emerges as a foremost foundation of employment generation in the country.

KEY WORDS: Information Technology, Electronic Hardware, Computer Hardware, Production, Production for Domestic Use, Exports and GDP.

INTRODUCTION

The growth and the scope of Information Technology, or IT have crossed everyone's mind at some point. The sector has shown unprecedented growth, providing essential services needed to run the economy around the globe. An element that is very critical to the improvement of this industry is the hardware it uses, i.e. computer and the peripherals that are essential to run these services. While IT industry needs Computer hardware, computer software and data the hardware sector is one of the significant components of the Information technology industry. Computer hardware, Computer Software, and data, the hardware sector is one of the important components of the Information Technology industry.

Computer hardware refers to the pars of a computer and elated instruments. Internal hardware devices include hard devices, motherboards, and RAM and external hardware devices include keyboards, mouse, printers, monitors, and scanners. The internal hardware parts are referred to as components, while external hardware devices are usually called computer peripherals. Together, they all fall in the category of computers and hardware.

The gross domestic product (GDP) is a profitable indicator that reflects the economic value of all final goods and services generated by a country throughout a specific period. It is used to determine the wealth that a country generates. An increase in GDP, or expenses, consumption, and speculation, usually has an optimistic impact on the economy because it raises the income of businesses, households, and governments, giving them more money to invest and create jobs. The hardware industry helps to lead the growth in the industries like medical and healthcare industries, telecommunication industry and automotive industry. This industry plays very vital role in the employment growth because this industry employs workers of all education and skill levels such as Computer scientists and engineers; development, design, and production engineers; system analysts and set-up specialists; facility technicians; quality assurance specialists; and computer sales representatives.

OBJECTIVES

1. To evaluate the trends in Information Technology and Electronic Hardware production, Domestic Use, Exports of India and share in India's GDP.
2. To examine the Computer Hardware Production in GDP of India.
3. To analyse the Computer Hardware Exports and Share in GDP of India.
4. To examine the Computer Hardware Production for Domestic use in India's GDP.

DATA SOURCES AND METHODOLOGY

The secondary data is used to investigate contribution of Computer Hardware industry in GDP of India. The main sources of derivative information are Statistical Year Books of Electronic and Computer Software Export Promotion Council of India, Ministry of Electronics and Information Technology and National Association of Software and Services Company (NASSCOM) Reports. Statistical tools like averages, percentages, growth rates, Average Annual Growth rate and Compound Annual Growth Rate are calculated to analyse the data.

INFORMATION TECHNOLOGY (IT) AND SHARE IN GDP OF INDIA

The production of IT growth is impressive due to two reasons. The first one is that this growth has been accompanied by significant increase in exports of the sector. India's share in the world software and IT services fabrication and export has been increasing overtime. The second reason is that, production in this sector has been effected entirely by the private firms with institutional and policy support from the government.

The growth, production of IT industry, Share in GDP of India has been shown in table1. The table reveals that the entire production of IT industry is increasing from the year 2011-12 to 2020-21, i.e., from Rs. 561565 crore to Rs. 1919592crore. The share of information technology production in gross domestic product (GDP) of India has been depicted in this table. The table reveals that gross domestic product (GDP) of India at constant prices has been increased from the year 2011 to 2020-21 i.e., from Rs. 8736329 crore to Rs. 13512740 crore. The share of information technology in GDP of India was increased from 6.43 percent to 14.21 percent from 2011-12 to 2020-21, due to the government technology focused economic growth agenda, mainly focused on Digital India and Make in India.

The production of information technology (IT) for domestic use, growth rate and its share in GDP of India also explained in this table. It is shown in table that the production of IT for domestic use has due to the deployment of demand from the USA for exports. The making of IT for domestic use was 192438 crore in 2011-12 and improved to 755965 crore in 2020-21, mainly gained momentum in the year 2016-17 when it increased to Rs.424617crore from Rs. 192438 crore. The contribution of domestic IT production in GDP was only 02.20 percent in 2011-12 and increased 5.59 percent in 2020-21. This table represents the percentage share of IT domestic use in GDP was continuously increased. It is given the positive impact to the Indian Economy.

This table besides depicted the Production of information technology (IT) for exports, growth rate and its share in GDP of India. It is shown in table that from 2011-12 to 2020-21, the IT production for exports has increased in absolute terms form Rs. 369127 crore to Rs. 1163627 crore. It's clear from the table that the contribution of information technology exports in GDP of India is increasing from the years 2011-12 to 2020-21i.e., 4.23 percent to
8.61 percent, even then there are continuously increase in the share of IT exports in GDP.

Table-1

Growth of Information Technology (IT) Industry and Share in GDP of India

Year	GDP of India	IT Production	Share of IT Production in GDP (%)	IT Production for Domestic Use	Share of IT Domestic use in GDP (%)	IT Exports	Share of IT Exports in GDP (%)
2011-12	8736329	561565	6.43	192438	2.20	369127	4.23
2012-13	9213017	687200	7.46	238200	2.59	449000	4.87
2013-14	9801370	818326	8.35	264526	2.69	553800	5.65
2014-15	10527674	924003	8.78	293578	2.79	630425	5.99
2015-16	11386145	1073276	9.43	335413	2.95	737863	6.48
2016-17	12196006	1207109	9.89	424617	3.48	782492	6.42
2017-18	13010843	1349864	10.37	537204	4.13	812660	6.25
2018-19	14003316	1607702	11.48	604826	4.32	1002876	7.16
2019-20	14569268	1823500	12.52	736415	5.05	1087085	7.46
2020-21	13512740	1919592	14.21	755965	5.59	1163627	8.61
		CAGR=14.63 %		CAGR=16.42 %		CAGR= 13.61 %	

Source: Electronics and Software Export Promotion Council, Statistical Year book, various issues

ROLE OF ELECTRONIC HARDWARE INDUSTRY IN INDIA'S GDP

The Electronic Hardware Industry has evolved to offer numerous innovative products for the handiness of the mankind. Electronics devices have become integral part of human life and are playing a major role in their everyday routine activities. The electronics hardware industry is recognized as one of the greatest growing segment in terms of international trade. The Role of Electronics and Hardware Industry in India GDP is to certify the growth of the other industries and donate to the growth of the Indian economy. The Electronics and Hardware Industry depends on the mechanized of the semiconductors. Role of Electronic Hardware Industry in India GDP is critical for the development of the IT and ITES sector in India. Electronic hardware is major components of several industrial sectors such as Consumer Electronics, Telecom Equipment, Instrument Office, Medical Equipments, Electronic Components, and Computer Hardware etc.

Table -2

Electronic Hardware Production, Share in GDP of India (Rs. Crore)

Years	GDP of India	Electronic Hardware Production	Share of Electronic Hardware Production in GDP (%)	Electronic Hardware Domestic Use	Share of Electronic Hardware Domestic Use in GDP (%)	Electronic Hardware Exports	Share of Electronic Hardware Exports in GDP (%)
2011-12	8736329	143300	1.64	100673	1.15	42627	0.49
2012-13	9213017	177500	1.93	133500	1.45	44000	0.48
2013-14	9801370	196103	2.0	149803	1.53	46300	0.47
2014-15	10527674	199294	1.89	162538	1.54	36756	0.35
2015-16	11386145	229100	2.01	191772	1.68	37328	0.33
2016-17	12196006	301800	2.47	263673	2.16	38127	0.31
2017-18	13010843	405525	3.12	366385	2.82	39140	0.3
2018-19	14003316	468006	3.34	409050	2.92	58956	0.42
2019-20	14569268	546500	3.75	466479	3.20	80021	0.55
2020-21	13512740	507760	3.76	429133	3.18	78627	0.58
		CAGR=15.09 %		CAGR=17.48 %		CAGR=7.04 %	

Source: Electronics and Software Export Promotion Council, Statistical Year book, various issues.

Electronic hardware production and growth rate and share on GDP of India has been shown in table 2. The table reveals that the production of Electronic hardware has increased from 2011-12 to 2019-20 i.e., Rs. 143300 crore to Rs. 546500 crore except the year 2020-21 when it was Rs. 507760 crore. The production of hardware has been increased due to the increased demand from households and businesses and also due to the increased purchases by industry verticals. The share of Electronic hardware in GDP of India was low i.e., less than four percent. The share of electronic hardware in gross domestic product (GDP) of India was 1.64 percent in 2011-12 and increased to 2 percent in 2013-14, while after that its share has decreased to 1.89 percent in 2014-15.

The table explained the Electronic hardware production for for domestic use, growth rate and share in GDP of India. The table shows the production of Electronic hardware for domestic use was Rs. 100673 crore in 2011-12 and increased to Rs. 466479 crore in 2019-20. It decreased in the year 2020-21 to Rs.429133crore. It's clear from the table that the contribution of Electronic hardware for domestic use in GDP of India is increasing from the years 2011-12 to 2019-20 i.e., 1.15 percent to 3.20 per cent, even then there are lot of variations in the share of Electronic hardware for domestic use in GDP. Firstly, the contribution of Electronic hardware for domestic use in GDP is decreased from the 3.20 percent in 2019-20 to 3.18 percent in 2020-21. In this context Electronic hardware for domestic use contribution of

India's GDP is increasing simultaneously. This represents India's population using more amounts of electronic hardware instruments in their daily life.

The tale also shows the Electronic hardware production for exports, growth rate and share in GDP of India. The table shows the production of Electronic hardware for exports was Rs. 42627 crore in 2011-12 and increased to Rs.46300 crore in 2013-14. It decreased in the year 2014-15 to Rs. 36756 crore and in 2016-17 again increased to Rs. 38127 crore, while in the next years, it further increased to Rs.39140 crore to Rs. 78627 crore in 2015-16. It's clear from the table that the contribution of Electronic hardware exports in GDP of India is increasing from the years 2011-12 to 2020-21 i.e., 0.49 percent to 0.58 per cent, even then there are lot of variations in the share of Electronic hardware exports in GDP. Firstly, the contribution of exports in GDP is decreased from the 0.49 percent in 2011-12 to 0.42 percent in 2018-19. An increase in GDP has been noticed in the year 2019-20 to 2020-21, i.e., 0.55 percent to 0.58 percent.

COMPUTER HARDWARE INDUSTRY IN INDIA

Technology plays a very crucial and important role not only in introduction of new products but also in price determination in the computer hardware industry. India is a price-sensitive market, and its unique socio-economic requirements drive substantial demand for cost-effective and robust computer and hardware products. There is a massive market for products that meet basic needs at penetration price points. A time existed when this market was dominated by products manufactures in other countries like China, Taiwan, South Korea, etc. But the initiatives and efforts brought by the government to promote co puter and IT product manufacturing in the country itself through programs like Make in India initiatives significantly pushed the manufacturing and the demand for made in India computers and the hardware devices. Moreover, in the past couple of years, computer and hardware manufacturing has seen a particular liking among budding entrepreneurs from IT, non-IT fields, and even the existing domestic electronic products manufactures. The government has been introducing big IT-specific projects like the UIDAI, the National Knowledge Network, the National Optic Fibre Network, etc. To promote domestic manufacture in the hardware sector government launched various schemes like The Electronic Manufacturing Cluster Scheme, Modified Special Initiatives Package Scheme and Preferential Market Access Scheme.

Table -3

Computer Hardware Production, Share in GDP of India (Rs. Crore)

Years	GDP of India	Computer Hardware Production	Growth Rate	Share of Computer Hardware Production in GDP (%)	% of computer Hardware Production in IT Production	% of Computer Hardware Production in Electronic Hardware Production
2011-12	8736329	16500	---	0.189	2.94	11.51
2012-13	9213017	24300	47.27	0.264	3.54	13.69
2013-14	9801370	10139	-58.3	0.103	1.24	5.17
2014-15	10527674	18691	84.35	0.178	2.02	9.38
2015-16	11386145	19000	1.653	0.167	1.77	8.29
2016-17	12196006	20800	9.474	0.171	1.72	6.89
2017-18	13010843	21401	2.889	0.164	1.59	5.28
2018-19	14003316	21180	-1.03	0.151	1.32	4.53
2019-20	14569268	22500	6.232	0.154	1.23	4.12
2020-21	13512740	22000	-2.22	0.163	1.15	4.33
		CAGR=3.25%	**AAGR=10.03%**			

Source: Electronics and Software Export Promotion Council, Statistical Year book, various issues

The table 3 indicates the Computer Hardware Production, growth rate and share in GDP of India. The table shows the Production of Computer Hardware was Rs. 16500crore in 2011-12 and increased to Rs. 24300 crore in 2012-13. It decreased in the year 2013-14 to Rs. 10139 crore to Rs. 22500 crore in 2019-20, while in the next year, it further decreased to Rs.22000 crore in 2020-21. It's clear from the table that the contribution of Computer Hardware production in GDP of India is increasing from the years 2011-12 to 2012-13 i.e., 0.189 percent to 0.264 per cent. Firstly, the contribution of Computer Hardware production in GDP is decreased from the 0.178 percent in 2014-15 to 0.103 percent in 2013-14.The growth rate of Computer Hardware Production is the highest in the year 2014-15 i.e., 84.35 percent and the lowest growth rate is recorded in the year 2020-21 i.e.,-2.22. On an average Annual Growth Rate is 10.03 per cent and Compound Annual Growth Rate is 3.25 per cent.

Table -4

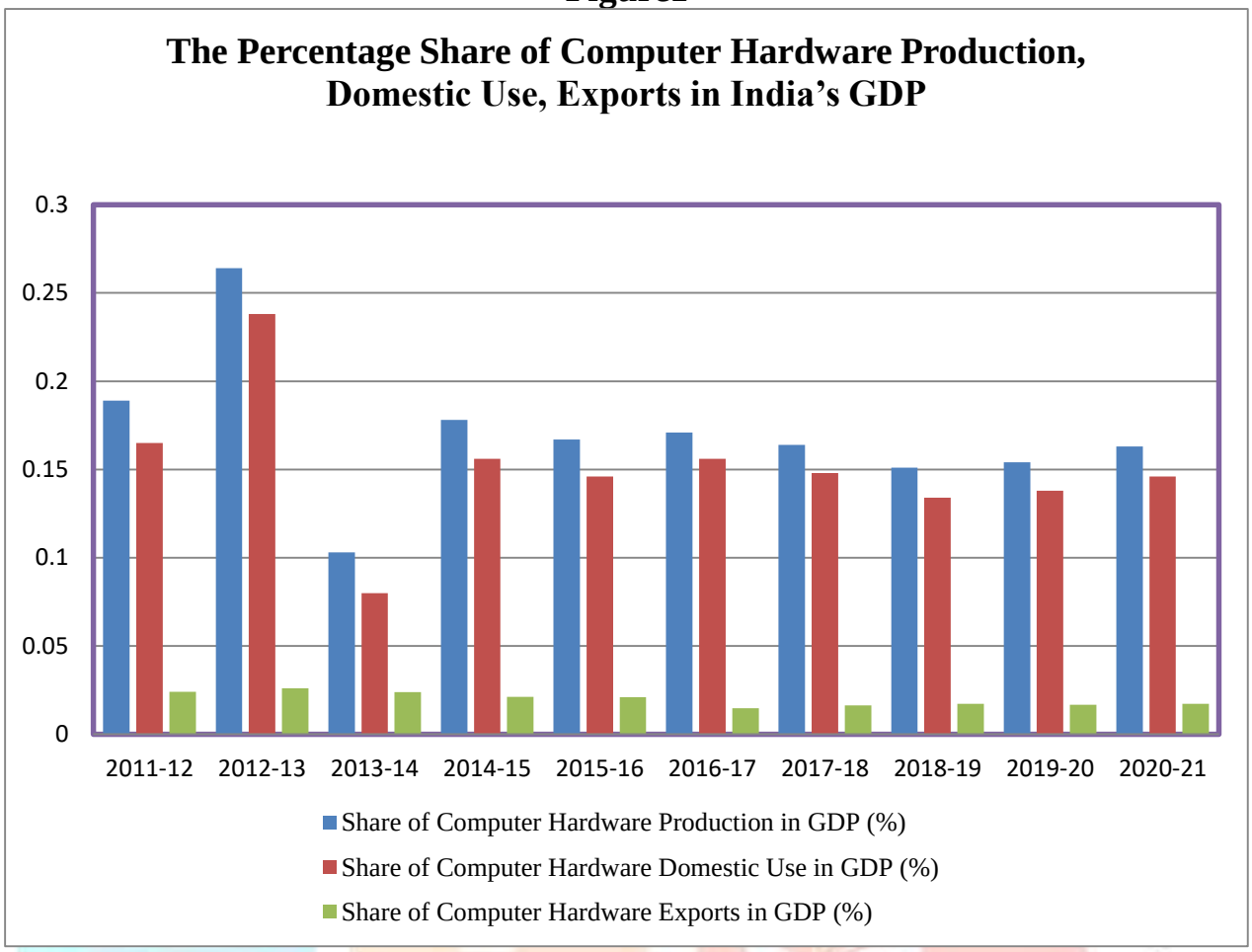
Computer Hardware for Domestic Use, Share in GDP of India (Rs. Crore)

Years	GDP of India	Computer Hardware for Domestic Use	Growth rate	Share of Computer Hardware Domestic Use in GDP (%)	% of Computer Hardware Domestic Use in IT Domestic Use	% of Computer Hardware Production in Electronic Hardware Domestic Use
2011-12	8736329	14400	---	0.165	7.48	14.30
2012-13	9213017	21900	52.08	0.238	9.19	16.40
2013-14	9801370	7796	-64.4	0.08	2.95	5.20
2014-15	10527674	16463	111.2	0.156	5.61	10.13
2015-16	11386145	16611	0.899	0.146	4.95	8.66
2016-17	12196006	18994	14.35	0.156	4.47	7.20
2017-18	13010843	19271	1.458	0.148	3.59	5.26
2018-19	14003316	18758	-2.662	0.134	3.10	4.59
2019-20	14569268	20048	6.877	0.138	2.72	4.30
2020-21	13512740	19676	-1.856	0.146	2.60	4.59
		CAGR=3.53 %	**AAGR=13.11 %**			

Source: Electronics and Software Export Promotion Council, Statistical Year book, various issues

The table 4 shows the Computer Hardware production for domestic use, growth rate and share in GDP of India. The table reveals the domestic use of Computer Hardware was Rs. 14400 crore in 2011-12 and increased to Rs. 21900crore in 2012-13. It decreased in the next year to Rs.7796 crore, again it was increased from Rs. 16463crore in 2014-15 to Rs. 20048 crore in 2019-20. It's clear from the table that the contribution of Computer Hardware production for domestic use in GDP of India is increasing from the years 2011-12 to 2012-13 i.e., 0.165 percent to 0.238 percent, even then there are lot of variations in the share of domestic use in GDP. Firstly, the contribution of production for domestic use in GDP is decreased from the 0.08 percent in 2013-14 to 0.156 percent in 2016-17.The growth rate of Computer Hardware production for domestic use is the highest in the year 2014-15 i.e., 111.2 percent and the lowest growth rate is recorded in the year 2013-14 i.e.,-64.4. On an average Annual Growth Rate is 13.11 per cent and Compound Annual Growth Rate is 3.53 per cent.

Figure1



The table 5 indicates the Computer Hardware Exports, growth rate and share in GDP of India. The table shows the Exports of Computer Hardware was Rs. 2100 crore in 2011-12 and increased to Rs. 2400 crore in 2012-13. It decreased in the year 201-14 to Rs. 2343 crore to Rs. 1806 crore in 2016-17, while in the next year, it further increased to Rs.2130 crore in 2017-18 to Rs. 2452 crore in 2019-20. It's clear from the table that the contribution of Computer Hardware exports in GDP of India is increasing from the years 2011-12 to 2012-13 i.e., 0.024 percent to 0.0261 per cent, even then there are lot of variations in the share of Computer Hardware exports in GDP. Firstly, the contribution of Computer Hardware exports in GDP is decreased from the 0.0239 percent in 2013-14 to 0.0148 percent in 2016-17.The growth rate of Computer Hardware Exports is the highest in the year 2012-13 i.e., 14.29 percent and the lowest growth rate is recorded in the year 2016-17 i.e.,-24.4. On an average Annual Growth Rate is 1.94 per cent and Compound Annual Growth Rate is 1.13 per cent.

Table -5

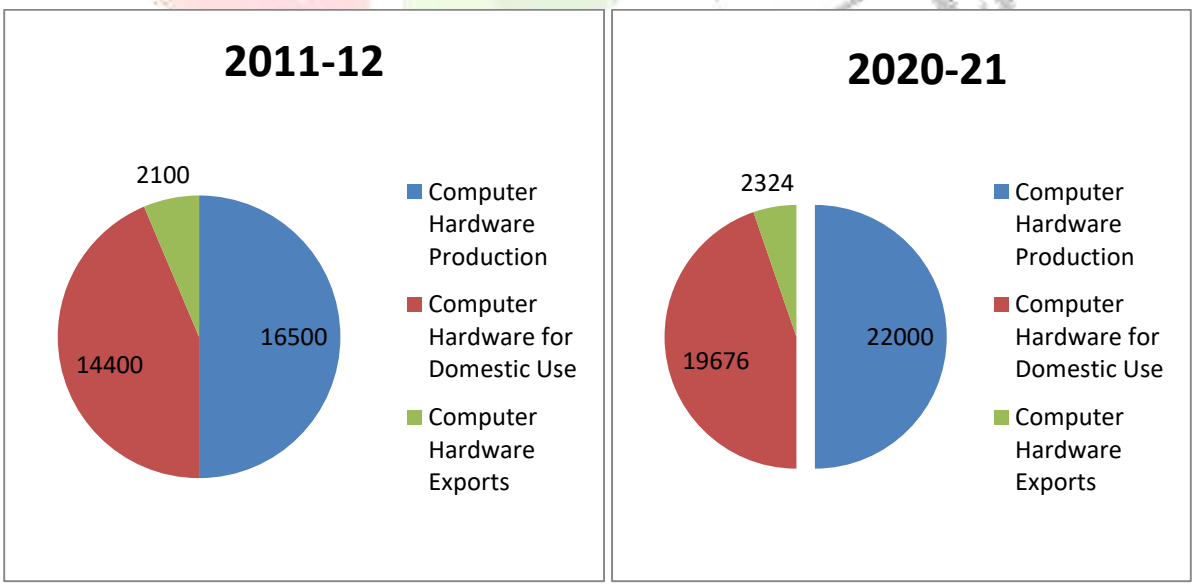
Computer Hardware Exports, Share in GDP of India (Rs. Crore)

Years	GDP of India	Computer Hardware Exports	Growth rate	Share of Computer Hardware Exports in GDP (%)	% of Computer Hardware Exports in IT Exports	% of Computer Hardware Exports in Electronic Hardware Exports
2011-12	8736329	2100	---	0.024	0.57	4.93
2012-13	9213017	2400	14.29	0.0261	0.53	5.45
2013-14	9801370	2343	-2.375	0.0239	0.42	5.06
2014-15	10527674	2228	-4.908	0.0212	0.35	6.06
2015-16	11386145	2389	7.226	0.021	0.32	6.40
2016-17	12196006	1806	-24.4	0.0148	0.23	4.74
2017-18	13010843	2130	17.94	0.0164	0.26	5.44
2018-19	14003316	2422	13.71	0.0173	0.24	4.11
2019-20	14569268	2452	1.239	0.0168	0.23	3.06
2020-21	13512740	2324	-5.22	0.0172	0.20	2.96
		CAGR=1.13%	**AAGR=1.94%**			

Source: Electronics and Software Export Promotion Council, Statistical Year book, various issues.

Figure-2

The Production, Domestic Use, Exports of Computer Hardware (Rs. Crore)



MAJOR FINDINGS OF THE STUDY

A few of the findings emanating from the study are:

1. Desktop monitors and laptops produce major physical health concerns for humans when bodies are forced into positions that are unhealthy and uncomfortable in order to see the screen better.
2. Poor infrastructure is another cause that seems to have alleged back the industry.
3. India's lack of success in exporting computer hardware to the global market is deeply rooted to a variety of reasons which range from market dynamics to inadequacy of support policy initiatives.
4. Inadequacy of familial investment, incapacity to attract foreign investment, mega investments from multinational companies.

MAJOR RECOMMENDATIONS:

The initiatives to be taken by the Government of India include:

1. The state governments are required to gear up for provision of world-class infrastructure facilities to the IT industries, especially the big players, both domestic and international.
2. The government, in an attempt to encourage manufacture of computer hardware in India has changed the tariff structure significantly.
3. Special incentives should be provided by State Governments for IT hardware sub-sector in states which have high specialised IT services as the sub-sector is highly capital intensive.
4. Indian Government should promote new innovative development projects for R&D activities and human resource development and reducing operational costs of manufacturing and improving business attractiveness.

CONCLUSION:

From the above analysis, it is clear that The Indian computer hardware market has exhibited high growth rates during the past five years. The high growth rates can be attributed to the fact that a large middle class has emerged in India, and there has been rapid growth in the IT industry. The share of Computer hardware export in total export as well as its contribution to GDP has steadily increased over the years. That Computer hardware sector has emerged as a foreign exchange earner and generator of large scale employment opportunities.

REFERENCES:

1. A Brief Report on "Electronics Industry in India", Corporate Catalyst India, August 2012.
2. Electronics and Software Export Promotion Council (ESC), Statistical Year book, different Years.
3. G. V. Vijayasri(2024) ,"The Role Of Information Technology Industry in India's GDP", in International Journal of Innovative Research in Technology, Volume 10, Issue 2, ISSN-2349-6002, pp-935-943, July 2023.
4. G. V. Vijayasri(2024), "The Performance Of Consumer Electronics Industry in India's GDP" in Journal of Emerging Technologies and Innovative Research, Volume 11, Issue 2, ISSN-2349-5162, pp-493-504, February 2024.
5. Joseph, K.J. (2005), "Strategic Approach to Strengthening the International Competitiveness in Knowledge Based Industries: Electronics Industry" RIS-P#88/2005 RIS, New Delhi.
6. Kumar (2006), "World Electronic Component Production Scenario: An Indian Perspective" Electronics Information and Planning, Vol 33, 3 –4, Dec2005-Jan-2006, Dept. of IT, Government of India.