

Performance of IT Software and Service Sector in GDP Contribution of Developing Countries

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Abstract

According to the WESP (World Economic Situation and Prospects, 2019) the countries in the world are divided into; developed countries, transition countries and developing countries. The United Nations Economic and Social Council decided to choose some of the countries from developing countries as least developed countries as per three different indexes; Index of human assets, per capita GNI and economic vulnerability index. The paper aims to analyze the performance of the IT software and service sector in GDP (Gross Domestic Product) contribution of developing countries as well as least developed countries, least developed countries are chosen to have a comparison between the performances of those sectors in different economies. The data has been chosen from United Nation Conference on Trade and Development from 2000s to 2017, and for comparison 20 developing countries and 14 least developed countries from these regions; Latin America, Africa, Western Asia, and East Asia as well as South Asia, have been chosen too. We found; the average share of the service sector and IT software sector were 53 percent and 32.6 percent in GDP growth of all developing countries, and 47.02 percent and 22.57 percent in GDP growth of all least developed countries, respectively, that shows the share of these sectors in developing countries are higher than the least developed countries, and as per the data, the performance of these sectors are much higher in developing countries than the least developed countries.

Key words: Developing Countries, Least Developed Countries, Service Sector, IT Sector and GDP (Gross Domestic Products)

1. Introduction

Countries in the world are divided into many different parts as per different view. According to the WESP (World Economic Situation and Prospects, 2019) the countries in the world are divided into; developed countries, transition countries and developing countries. The United Nations Economic and Social Council decided to choose some of the countries from developing countries as least developed countries as per three different indexes Index of human assets, per capita GNI and economic vulnerability index. According to the world bank that has been retrieved from (United Nation, 2019), countries are classified according to their per capita GNI, and countries have been grouped as low-income, lower-middle-income, upper-middle-income, and high-income. Countries with less than 995 US dollars classified as low-income countries, between 996 US dollars and 3,895 US dollars are classified as lower-middle-income countries, and the countries between 3,896 US dollars and 12,055 US dollars classified as upper-middle-income countries, and those with incomes of more than 12,056 US

dollars classified as high-income countries. Developing countries tend to have some characteristics in common like; low level of health care system, poor at energy, more pollution, low education levels, more government corruption, problem in sanitation and drinking water, high poverty, unemployment problem, more depend on labor force and many more, (Althor, Watson, & Fuller, 2016). According to the UNCTAD (United Nation Conference on Trade and Development) the GDP growth rate of the developing countries in 2017s was 7.6 percent, and the contribution of the service sectors in GDP growth was 55.7 percent, that shows the highest performance in the service sector over its lagged or previous years.

Developmental processes usually coincide with a growing role of services in the economy which goes alongside with a reduced role for agriculture. The service sector can be said as one of the significant component of any country's economy, which makes a direct and significant contribution to GDP and accounts for more than 50 percent of GDP growth of developing countries. This sector is one of the sectors that creates more jobs as well as provides crucial inputs for the rest of the economy, and it is also effects more of the investment part in the economy to determine the growth and development of the country. According to the (United Nation, 2019), service sector majorly has three components such as; (wholesale, retail trade, restaurant and hotel), (transports, storage and communications), and (other activities), and all these components also divided into different sub-categories.

From all the above components many of them are key contributors to most other business like; health and education, infrastructure services such as energy, telecommunications and transportation; financial services; and legal and accountancy services which are part of the institutional framework required to underpin a healthy market economy, and Information Technology (IT) software which increase the knowledge and productivity of the labors, increase the sales of the industry by e-commerce and so on.

The International Foundation for Information Technology (IF4IT)¹ defined IT (Information Technology) as the skill being used for analyzing, developing, planning, testing, allocating, creating, understanding, supporting and operating computer software, hardware, and other computer-related structures existing for the resolution of statistics, data and knowledge processing. In a simple form Information Technology can be referred to as the use of latest technology updates the world has to offer in gathering information by means of effective communication. Though, some aspects of it requires thorough analysis to avoid misconceptions.

IT sector is one of the most important part of service sector that had an ascending slope in the growth of the service sector as well as GDP. This sector can bring the developmental benefits for developing and least developed countries under the 6 different categories; economic development, social development, good governance, education, health as well as ecology and sustainability. However, this sector can contribute on economic development of developing countries such as; increase the GDP, exports, innovation, and competitiveness as well as investment, and create employment. (Federal Ministry of Economic , 2011)

¹ Padua. G, (2018), "The Growth of Information Technology", Retrieved from Infinity hub, <https://infinityhub.com/the-growth-of-information-technology/>



The purpose of this paper is to analyze the performance of the IT software and service sector in GDP contribution of the developing countries and least developed countries for compression.

This paper aims; to analyze the performance of the IT software and service sector in the GDP contribution of developing countries as well as least developed countries, and to compare the developing and least developed countries with regards to the performance of the IT software and service sector in GDP contribution

2. Literature Review

(Baumol, W, 1967) examined that service sector trend over time had a higher share in GDP that shows a higher real growth in service has not been counterbalance by price fall.

(Bhattacharya, B & Mitra, A, 1997) noted that the total employment in service sector in India did not affect by the open economy, and open economy had positive effect on these parts; moving of workers from low productive sector to specialized sector, and increasing international trade. According to them; within 62 years all the three types of sectors in the economy faced a fastest growth and contributed much more on GDP growth rate of India that, at this time, the service sector or tertiary sector growth rate has seen an increase more than the primary sector and secondary sector.

(Pohjola, M, 2000) postulated that developing countries have a low level of GDP than the developed countries. According to him, use of ICT is the cause of the gap between developing countries and developed countries it is because there is lack of knowledge and incomplete infrastructure in developing countries to support the effective use of ICT. For example, Egypt's average annual percentage GDP which was devoted to expenditure on ICT was 2.2 percent during the period 1993-2001 and Sweden was 8.8 percent.

(Nasscom, 2000) stated that the software industry in India because of solving the Y2K earned an accumulative total of US \$ 2.5 billion from 1996 to 1999, that shares are significant but cannot be considered as the only factor for the faster growth software export.

(Steinmueller, W, 2001) studied that Information and communication technology has been a mainstay for the past few decades, which can support development strategies for developing countries to narrow the gap between developed and developing countries in production and output.

(Datta, M, 2001) in his research on the remarkable growth of the third sector, he noted that the share of GDP has been steadily improving in the service sector and established as the largest sector of the Indian economy. He also pointed out the importance of some subsections such as transport in the field of growth and hence incorporated it into the secondary sector. He further stated that the growth of other sub-areas such as defense and public management is neither related to the demand for the development process nor related to the need to develop efficiency in the developing economy.

(Ferran, C & Salim, R, 2005) stated in their research that ICT can put effect on economic growth in the developing countries when there be some set of conditions like external and internal. They also stated that the conditions may vary from one country to another depending on their economic development.

(Lal, K, 2007) examined five developing nations and found out that information communication technology infrastructure; communication is driver for growth and development.

(Francois, J & Hoekman, B, 2010) concluded that service sector performance could be a major factor in productivity growth economy wide and also that services sector policy across borders and domestic manifestation is a key driver in economic development.

(Dash, P, 2010) highly emphasized that service sector plays a large and a growing role in GDP and employment across a whole region. He said that his review of country experiences shows a great deal of heterogeneity in the relative importance of among Asian countries. For example, in 1980 the share of service to GDP and employment in Indonesia and Philippines but by 2010 it was outstandingly higher in Philippines.

(Eichengreen, B & Gupta, P, 2011) stated in their research that the service sector is significant for many developing countries in the world and of India's very important importance as a country. They also hypothesized that the service sector in India has grown rapidly over the past decades, in fact higher than the agricultural and manufacturing sectors. The service sector accounted for about 64.8% of GDP in 2012-13.

4. Research Method

This paper is an attempt to analyze the performance of IT software and service sector in developing as well as least developed countries from 2000s to 2017s. At first, the total value added of service sector and IT software are analyzed in developing and least developed countries as totally in each year and then for having a comparison between the different developing and least developed countries in performance of IT software and service sector in their GDP contribution four different periods (2000s, 2006s, 2012s and 2017s) have been used. In this paper the countries are classified as per WESP (World Economic Situation and Prospects) classification, and for comparison 20 developing countries from 78 countries and 14 least developed countries from 47 countries, as per different region, have been chosen randomly. Among the developing countries in Africa, East Asia, South Asia, Western Asia and Latin America just 4 countries in each region have been chosen and among the least developing countries in Africa just 4 countries, in East Asia just 4 countries, in South Asia all the four countries, in Western Asia and Latin America all the countries have been chosen randomly.

As performance of sector are qualitative in nature, we have taken the positive relationship between GDP contribution and performance. We supposed that increase in GDP contribution, means better performance of the sectors. The data is second hand, and has been gathered from most relevant websites like; UNCTAD (United Nation Conference on Trade and Development), and World Bank.

4. Result and Discussion

This part is for analyzing the data of IT software and service sector in the contribution of GDP (Gross Domestic Product) of developing and least developed countries. As IT software is a part of service sector, the portion of it in service sector also going to analyze too.

4.1. The performance of IT software and service sector in GDP contribution of developing countries

Service sector is the tertiary sector of an economy that playing a major role in the development of an economy. The development of this sector can bring development in primary sector as well as secondary sector by providing; finance, marketing, transport, insurance, and information technology and others. However, this sector in recent years grew at a very fast rate in the developing countries as well as last developed countries, and it is contributing a major share in terms of output, income and employment. Even as compare to primary and secondary sector, the productivity per worker in this sector is much higher.

In developing countries as per findings, the share of this sector has an ascending slope in GDP of them, and also the share of this sector is more than 50 percent in these countries. From 2000s to 2017s the total value added of service sector in developing countries was 168.19 trillion dollars, and the total GDP in value added in this period of time was 314.59 trillion dollars that shows an average of 53 percent share of tertiary sector in GDP of all developing countries. The share of service sector in some developing countries like; Argentina, Brazil, China, India, Turkey, Singapore, Pakistan and Egypt in 2017 were 67.5 percent, 72.24 percent, 50.39 percent, 53.85 percent, 60.23 percent, 75.19 percent, 56.28 percent and 53.96 percent respectively, that it shows the performance of this sector is very good. On the other hand, IT software is one of the most important part of service sector in an economy that can contribute on economic development of developing countries such as; increase the GDP, Increase the exports, increase in investment, creation of employment, increase innovation, and increase competitiveness. This sector also has a root in all other sectors of the production and one of the most important type of technology can bring economic growth in developing countries. The value added of IT sector from 2000s to 2017s in developing countries was 102.62 trillion dollars, and the contribution of this sector in service sector and GDP of that countries an averagely were 61 percent and 32 percent respectively. The more information and data are given as below;

Table 1: The performance of IT software and service sector in GDP contribution of developing countries

Year	Developing Countries					
	GDP in Million US \$	Services in Million US \$	IT Software in Million US \$	Share of Services in GDP (in %)	Share of IT software in GDP (in %)	Share of IT software in Service sector (in %)
2000	6693688.94	3629354.046	2156940.31	54.22	32.22	59.43
2001	6630493.464	3643676.415	2182127.78	54.95	32.91	59.89
2002	6810444.895	3689878.78	2202820.1	54.18	32.34	59.70
2003	7506596.444	4027850.441	2408395.03	53.66	32.08	59.79
2004	8762229.286	4612908.876	2725088.27	52.65	31.10	59.08

2005	10345346.92	5419541.732	3214440.05	52.39	31.07	59.31
2006	12076341.68	6299295.318	3746105.23	52.16	31.02	59.47
2007	14498786.33	7603645.423	4551110.91	52.44	31.39	59.85
2008	16982625.58	8721714.243	5215837.06	51.36	30.71	59.80
2009	16752820.23	8907259.487	5461468.59	53.17	32.60	61.31
2010	20218412.86	10542440.02	6422640.02	52.14	31.77	60.92
2011	23709746.32	12184382.15	7372918.32	51.39	31.10	60.51
2012	25328626.57	13140802.74	7982265.88	51.88	31.51	60.74
2013	26831579.55	14144054.23	8652588.26	52.71	32.25	61.17
2014	27941695.13	14973747.13	9197692.94	53.59	32.92	61.43
2015	27118636.86	15066760.92	9366486.82	55.56	34.54	62.17
2016	27155001.24	15282121.56	9580583.82	56.28	35.28	62.69
2017	29230229.59	16302450.77	10187663.3	55.77	34.85	62.49
Total	314593301.9	168191884.3	102627173			

Source: (UNCTAD)United Nation Conference on Trade and Development

The above table shows the contribution of IT software and service sector in GDP growth of the developing countries from 2000s to 2017. The total GDP, service and IT software of developing countries had an increase slope within 17 years. In 2000s the GDP of developing countries was 6.69 trillion dollars that it is increased to 29.23 trillion dollars in 2017s, and it shows a 336.3 percent increase in just seventeen years. On the other hand, the value added of service sector and IT sector in 2000s were 3.6 trillion dollars and 2.1 trillion dollars that it is increased to 16.3 trillion dollars and 10.1 trillion dollars in 2017, respectively, and these facts show these sectors within seventeen years had experienced an increase slope by 349.1 percent and 372.3 percent respectively.

Besides, the contribution of these sectors also increased in GDP of developing countries too. The service sector had just 54.22 percent share in GDP of developing countries in 2000s that in 2017s this share is increased to 55.77 percent. On the other hand, the share of IT sector and tertiary (service) sector in GDP growth of the developing countries also increased from 32.22 and 59.43 percent of 2000s to 34.85 and 62.49 percent of 2017 respectively. We can conclude that, service sector and IT sector are playing a major role in GDP growth of the developing countries and these sectors by performing well could increase the GDP growth of the developing countries.

Table 2: The performance of IT software and service sector in GDP contribution of selected developing countries

Developing Countries	2000		2006		2012		2017	
	Share in GDP growth in (%) service sector	IT sector	Share in GDP growth in (%) service sector	IT sector	Share in GDP growth in (%) service sector	IT sector	Share in GDP growth in (%) service sector	IT sector
Africa								
Cameroon	50.09	26.65	53.53	26.84	55.37	26.43	56.80	27.12
Egypt	52.86	27.15	47.50	23.02	50.61	26.83	53.96	29.14
Libya	45.90	33.64	20.01	13.14	32.00	23.84	31.99	23.84
South Africa	65.96	40.47	68.00	41.94	67.99	43.20	68.57	43.68
East Asia								
China	39.43	23.01	41.34	26.07	44.82	29.44	50.39	34.52
Philippines	51.55	27.95	54.12	28.14	56.90	31.05	59.89	33.46
Singapore	65.07	35.47	68.24	34.58	73.80	41.17	75.19	44.04
Thailand	54.66	25.36	51.32	26.13	51.06	26.40	56.29	27.86
South Asia								
India	45.88	29.34	47.99	29.74	50.03	29.03	53.85	31.11

Iran (Islamic Republic of)	51.83	27.95	53.93	47.01	27.05	57.55	49.94	27.45	54.97	55.03	32.15	58.41
Pakistan	52.87	21.77	41.17	56.04	23.15	41.30	53.40	22.32	41.79	56.28	24.37	43.30
Sri Lanka	52.42	24.02	45.82	60.34	33.19	55.00	59.69	32.21	53.96	61.37	34.92	56.91
Western Asia												
Iraq	10.83	2.45	22.63	33.07	19.44	58.78	35.68	22.35	62.65	46.17	26.99	58.47
Kuwait	42.47	32.04	75.45	37.73	27.28	72.30	32.85	25.13	76.48	50.86	39.54	77.74
Saudi Arabia	41.22	30.45	73.87	34.48	24.53	71.16	35.21	22.76	64.65	52.39	35.21	67.21
Turkey	58.69	30.27	51.58	60.82	30.44	50.05	60.88	33.18	54.50	60.23	32.30	53.64
Latin America												
Argentina	69.53	43.92	63.17	57.43	33.48	58.29	63.98	39.99	62.50	67.55	42.49	62.90
Brazil	67.68	50.22	74.19	67.18	46.35	68.99	69.07	45.28	65.55	72.24	48.24	66.77
Colombia	61.63	40.96	66.47	58.12	37.50	64.52	55.89	37.33	66.80	60.93	40.44	66.37
Mexico	60.49	31.55	52.16	61.21	33.58	54.85	61.88	33.50	54.13	63.92	32.93	51.52

Source: (UNCTAD)United Nation Conference on Trade and Development

The above table shows the performance of IT software and service sector in GDP contribution of 20 selected developing countries that are chosen by their region. The developing countries in; Latin America, Africa, Western Asia, and East Asia as well as South Asia are experienced high degree share of service sector in their GDP growth contribution. Among the selected African countries, except Libya, the other countries have above 50 percent share of service (tertiary) sector in their GDP growth. In Libya the share of service sector was so high in 2000s that was 45.9 percent, but this share is decreased in other years. Since 2000s, in all the selected developing countries of East Asia the share of service sector

was more than 50 percent. Among the selected East Asian countries, Singapore had the most share of service sector in its GDP growth than other countries that in 2017 this share was 75.19 percent. Besides, in selected south Asian countries since 2000s the share of tertiary sector was above 50 percent except India. In 2000s the share of service sector in GDP growth of India was 45.88 percent that from 2012 this share is started to increase and in 2017 this share became 53.85 percent. However, the share of service (tertiary) sector in western Asian developing countries was less than 50 percent, except Turkey, but since 2000s the share of this sector is started to increase in these countries. Turkey, Saudi Arabia, Kuwait, and Iraq in 2017s experienced to highest share of service sector in their GDP growth by 60.23 percent, 52.39 percent, 50.83 percent, and 46.17 percent respectively. The contribution of service sector in GDP growth of Latin American countries were more than 55 percent since 2000s. Among the selected countries of Latin America in 2017s Brazil had the highest portion of service sector in its GDP growth.

Whenever the contribution of service sector in GDP growth of developing countries had an ascending slope, in that time the share of IT sector also had an ascending slope. The share of IT sector in GDP growth of selected African countries was stable. South Africa, Cameroon, Egypt in 2017 had the highest portion of IT sector in their GDP growth that were around 43.68 percent, 27.12 percent, and 29.14 percent respectively except Libya. East Asian countries also had faced increase regarding the contribution of IT sector in their GDP growth since 2000s. Singapore, China, Philippines and Thailand had the highest IT service contribution in their GDP growth in 2017 respectively. The selected South Asian countries also had faced increase regarding the contribution of IT sector in their GDP growth since 2000s. Sri Lanka, Iran (Islamic Republic), India and Pakistan had the highest IT service contribution in their GDP growth in 2017 respectively. The share of IT sector in GDP growth of selected western Asian countries was stable too. Iraq, Kuwait, Saudi Arabia in 2017 had the highest portion of IT sector in their GDP growth that were around 26.99 percent, 39.54 percent, and 35.21 percent respectively except Turkey. The share of IT sector in Latin America is also high in GDP growth of that countries. In 2017, Brazil had the highest portion of IT in its GDP growth than the other countries.

Generally, we can conclude that the performance of the IT sector and service sector is increasing from the previous years because the share of these sector are increasing in GDP.

countries

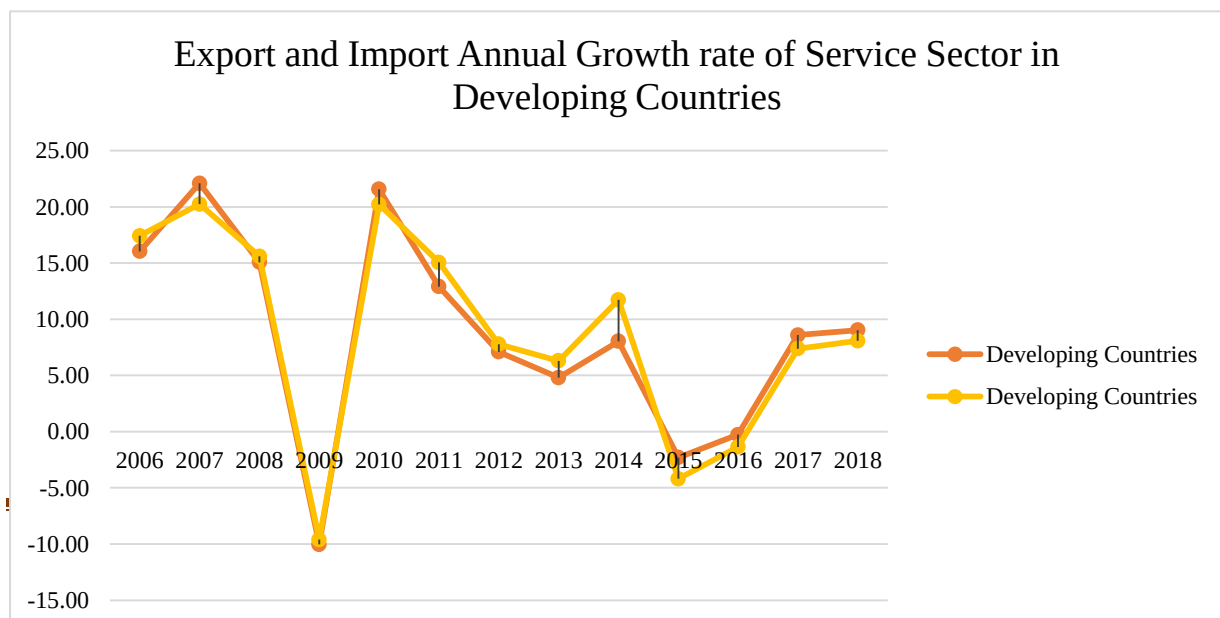


Figure 1: The trends of export and import of service sector growth rate in developing

Source: (UNCTAD)United Nation Conference on Trade and Development

The above figure shows the trend of export and import growth rate of service sector in developing countries. As per figure the export and import growth rate of this sector were same in most of the times, and the export and import growth rate of this sector faced more fluctuation from 2006 to 2018. The highest export and import growth rate of service sector in developing countries were in 2007 by 22.09 percent and 20.2 percent respectively. On the other hand, the lowest export and import growth rate of service sector in developing countries were -10.04, and -9.61 in 2009 each respectively. From 2016 onwards, these countries are facing increase in their export and import growth of their service sector.

4.2. The performance of IT software and service sector in GDP contribution of least developed countries

The least developed countries are countries that their Index of human assets, per capita GNI and economic vulnerability index are lower than the other countries. These countries have more labor force and most depend on the agriculture sector. But among the three types of sectors the share of service sector has increased more than the other sector in these countries than the other sectors. However, this sector in recent years grew at a very fast rate in the developing countries as well as last developed countries, and it is contributing a major share in terms of output, income and employment. In least developed countries as per findings, the share of service sector has an ascending slope in GDP of them, and also the share of this sector is less than 50 percent in these countries. From 2000s to 2017s the total value added of service sector in least developed countries was 4.78 trillion dollars, and the total GDP in value added in this period of time was 10.16 trillion dollars that shows an average of 47.02 percent share of service or (tertiary) sector in GDP of all least developed countries. The share of tertiary sector in some least developed countries like; Vanuatu, Kiribati, Madagascar, Yemen, and Bangladesh, in 2017 were 65.53 percent, 60.77 percent, 58.76 percent, 57.57 percent, and 56.50 percent, were the most respectively, that it shows the performance of this sector is very good. On the other hand, IT software is one of the most important part of service sector in an economy that can contribute on economic development too. The value added of IT sector from 2000s to 2017s in least developed countries was 2.29 trillion dollars, and the contribution of this sector in service sector and GDP of that countries an averagely were 47.99 percent and 22.57 percent respectively. The more information and data are given as below;

Table 3: The performance of IT software and service sector in GDP contribution of least developed countries

Least Developing Countries						
Year	GDP in Million Us \$	Services in Million US \$	IT Software in Million US \$	Share of Services in GDP (in %)	Share of IT software in GDP (in %)	Share of IT software in Service sector (in %)
2000	189463.50	85056.11	40431.50	44.89	21.3	47.54
2001	195126.93	88300.99	42116.23	45.25	21.6	47.70
2002	210802.00	97145.12	47487.39	46.08	22.5	48.88

2003	236713.67	111506.36	54300.55	47.11	22.9	48.70
2004	271170.54	127017.40	61430.93	46.84	22.7	48.36
2005	319813.69	145937.03	69989.75	45.63	21.9	47.96
2006	384687.53	177969.42	86448.85	46.26	22.5	48.58
2007	464667.91	209268.54	100636.81	45.04	21.7	48.09
2008	563137.30	249391.48	119158.51	44.29	21.2	47.78
2009	556492.14	266895.61	127261.54	47.96	22.9	47.68
2010	625342.15	292569.74	138586.45	46.79	22.2	47.37
2011	741572.59	334834.86	159269.61	45.15	21.5	47.57
2012	786808.88	359463.38	169072.54	45.69	21.5	47.03
2013	854953.34	400884.60	190433.88	46.89	22.3	47.50
2014	919035.10	440160.44	209574.87	47.89	22.8	47.61
2015	895591.94	442381.70	212191.97	49.40	23.7	47.97
2016	914859.88	447970.85	218682.04	48.97	23.9	48.82
2017	1037464.11	504645.24	247845.45	48.64	23.9	49.11
Total	10167703.19	4781398.87	2294918.85			

Source: (UNCTAD)United Nation Conference on Trade and Development

The above table shows the contribution of IT software and service sector in GDP growth of the least developed countries from 2000s to 2017s. The total GDP, service and IT software of least developed countries had an increase slope within 17 years. In 2000s the GDP of least developed countries was 0.18 trillion dollars that it is increased to 1.03 trillion dollars in 2017s, and it shows a 444.57 percent increase in just seventeen years. On the other hand, the value added of service sector and IT sector in 2000s were 85.5 million dollars and 40.43 million dollars that it is increased to 504.6 million dollars and 247.84 million dollars in 2017, respectively, and these facts show these sectors within seventeen years these countries had experienced an increase slope by 493.3 percent and 513 percent respectively. From the above data we can conclude that, the share of service sector and IT sector are increased much more than the previous years and it shows a high shift from one sector to another sector.

Table 4: The performance of IT software and service sector in GDP contribution of selected least developed countries

	2000		2006		2012		2017	
Developing Countries	Share in GDP growth in (%)	sector in annual service	Share in GDP growth in (%)	sector in annual service	Share in GDP growth in (%)	sector in annual service	Share in GDP growth in (%)	sector in annual service



	service sector	IT sector		service sector	IT sector		service sector	IT sector		service sector	IT sector
Africa											
Angola	21.18	11.59	54.73	36.99	21.37	44.38	38.60	18.22	38.14	47.53	21.46
Madagascar	57.73	25.74	44.58	56.42	26.55	47.06	56.46	29.39	52.05	58.76	31.84
Malawi	39.06	23.98	61.39	47.42	26.61	56.12	52.71	27.34	51.87	52.23	23.73
Zambia	57.63	26.71	46.34	53.81	24.43	45.40	56.27	25.58	45.46	55.76	25.60
East Asia											
Cambodia	39.13	16.97	43.36	40.77	19.31	47.36	40.07	17.63	44.01	42.31	18.77
Kiribati	62.18	40.65	65.38	67.07	50.95	75.97	61.70	45.84	74.30	60.77	45.65
Myanmar	33.07	3.02	9.13	36.84	3.79	10.28	37.04	4.89	13.21	40.08	6.52
Vanuatu	61.92	31.67	51.14	68.58	36.03	52.54	65.27	32.00	49.03	65.53	32.45
South Asia											
Afghanistan	19.79	7.26	36.69	39.30	17.44	44.38	52.27	19.94	38.14	54.06	20.55
Bangladesh	49.20	27.16	55.21	55.59	31.05	55.85	56.16	30.14	53.67	56.50	32.42
Bhutan	36.62	22.28	60.83	38.88	21.81	56.10	38.76	20.79	53.63	39.29	19.76
Nepal	45.02	19.00	42.20	49.74	24.22	48.70	49.80	25.74	51.69	55.99	32.38

Western Asia

Yemen	45.69	19.18	41.98	48.38	18.61	38.46	49.01	21.71	44.29	57.57	25.93	45.04
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Latin America

Haiti	44.58	15.56	34.90	43.00	10.12	23.54	49.76	8.44	16.96	49.96	7.95	15.91
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Source: (UNCTAD)United Nation Conference on Trade and Development

The above table shows the performance of IT software and service sector in GDP contribution of 14 selected least developed countries that are chosen by their region. Among four selected African least developed countries, Zambia and Madagascar had more than 50 percent share of service (tertiary) sector in their GDP growth in 2000s, but after that time in 2017, beside those countries, the share of this sector in Malawi also increased more than 50 percent. Among the selected East Asian countries, Vanuatu had the most share of service sector in its GDP growth than other countries that in 2017 this share was 65.53 percent, and in 2017 Myanmar had the least share of services in its GDP growth that was 40 percent. Besides, in selected south Asian countries since 2000s the contribution of service sector was less than 50 percent. In 2017, Bangladesh and Bhutan had the highest and lowest portion of service sector in their GDP growth by 56.50 percent and 39.29 percent respectively. However, the contribution of service sector in western Asian least developed country (Yemen) was less than 50 percent, but since 2000s the share of this sector is started to increase in that country. The highest share of service sector in their GDP growth of Yemen was in 2017 and by 57.57 percent. The contribution of service sector in GDP growth of Latin American country (Haiti) was less than 55 percent since 2000s, and the highest portion of service sector in their GDP growth of Haiti was in 2017 by 49.96 percent

Whenever the contribution of tertiary sector in GDP growth of least developed countries had an ascending slope, in that time the share of IT sector also had an ascending slope. The share of IT sector in GDP growth of selected African countries was stable. Madagascar and Zambia in 2017 had the highest portion of IT sector in their GDP growth that were around 31.84 percent, and 25.6 percent respectively. East Asian countries also had faced increase regarding the contribution of IT sector in their GDP growth since 2000s. Kiribati, and Vanuatu, had the highest IT service contribution in their GDP growth in 2017 respectively, and Malawi had at lowest IT service contribution in its GDP growth in 2017. The selected South Asian countries also had faced increase regarding the contribution of IT sector in their GDP growth since 2000s. Bangladesh, Nepal, and Afghanistan had the highest IT service contribution in their GDP growth in 2017 respectively, except Bhutan. The share of IT sector in GDP growth of Yemen had an increase slope and from 2000s to 2017 its increased by 25.9 percent. The share of IT sector in Latin America (Haiti) is so less in GDP growth of that country. In 2017, the share was just 7.9 percent.

Generally, we can conclude that the performance of IT sector and service sector is increasing from the previous years because the share of these sector are increasing in GDP.

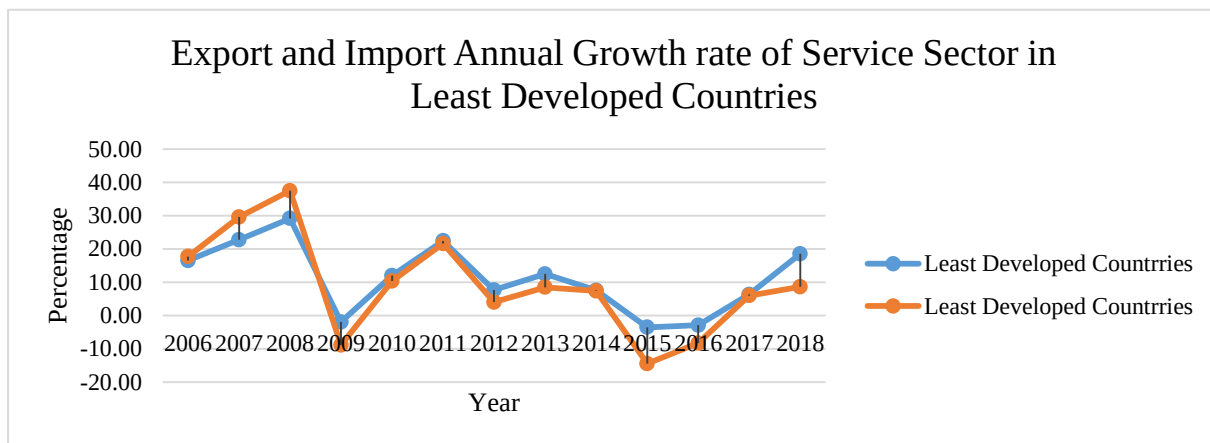


Figure 2: The trends of export and import of service sector growth rate in least developed countiest
Source: (UNCTAD)United Nation Conference on Trade and Development

The above figure shows the trend of export and import growth rate of service or tertiary sector in least developed countries. As per figure the export and import growth rate of this sector faced more fluctuation from 2006 to 2018. The highest and lowest export growth rate of service sector in (LDCs) or least developed countries were 29.16 percent and -3.55 percent in 2008s and 2015 respectively. On the other hand, the highest and lowest import growth rate of service sector in least developed countries were in 2008 and 2015 by 37.45 percent and -14.50 percent respectively.

4.3. Comparison of IT software and service sector in GDP contribution of the developing and least developed countries

From all the above data that mentioned before we can describe lots of difference between developing countries and least developed countries. The first different is regarding the number of the countries that counted as developing countries and least developed countries. GDP growth of these countries. The number of developing countries were 78 and the number of least developed countries were 47. The second difference is in developing countries; the GDP is much higher than the least developed countries. In 2000s the difference between their GDPs were (-97.17) percent that means the GDP of least developed countries was 97.17 percent less than the developing countries, and in 2017, this difference became to (-96.45) percent. When the GDP (Gross Domestic Products) of the countries have this much difference, so the share of the sectors also has much difference. So the third difference is in service sectors. The portion of service sector in GDP contribution of developing countries are more than the least developed countries. For example; in African developing countries, in 2017, the most portion of tertiary sector in GDP was belonging to South Africa by 68.57 percent, but in African least developed countries the highest share was belonging to Madagascar by 58.7 percent, in the same time. Around 10 percent difference is there between the highest shares. In East Asian developing countries, in 2017, the most share of service sector in GDP was belonging to Singapore by 75.19 percent, but in East Asian least developed countries the highest share was belonging to Vanuatu by 65.53 percent, in the same time. Around 10 percent difference is there between the highest shares. However, In

South Asian and Western Asian developing countries, in 2017, the most shares of service sector in GDP were belonging to Sri Lanka and Turkey by 61.37 percent and 60.23 percent, respectively, but in South Asian and Western Asian least developed countries the highest shares were belonging to Bangladesh and Yemen by 56.50 percent and 57.57 percent, in the same time, respectively. Around less than 5 percent difference is there between the highest shares. In Latin American developing countries, in 2017, the most share of service sector in GDP was belonging to Brazil by 72.24 percent, but in Latin American least developed countries the highest share was belonging to Haiti by 49.96 percent, in the same time. Around more than 20 percent difference is there between the highest shares.

The fourth difference is in regards to the share of IT service in developing countries and the least developed countries. In developing countries, the share is higher than the least developed countries. For example; among the selected African developing and least developed countries; South Africa and Madagascar had the highest share of IT in GDP growth and service sector by 43.68 percent, 63.70 percent and 31.84 percent, 54.19 percent, in 2017, respectively. However, among the selected East Asian developing and least developed countries; Singapore and Kiribati had the highest share of IT in GDP growth and service sector by 44.04 percent, 58.58 percent, and 45.65 percent, 75.12 percent, in 2017, respectively. In South Asian and Western Asian developing countries, in 2017, the most shares of IT sector in GDP and service sector were belonging to Sri Lanka and Kuwait by 34.92 percent, 56.91 percent and 39.5 percent, 77.74 percent, respectively, but in South Asian and Western Asian least developed countries the highest shares were belonging to Bangladesh and Yemen by 32.42 percent, 7.38 percent and 25.93 percent, 45.04 percent, in the same time, respectively.

Generally, from all the above facts and figures we can conclude that, when the share of service sector is increased in the GDP growth of the developing as well as least developed countries in that time the share of IT sector also increased in GDP growth and service sector too. Or in another meaning the role of IT sector is so much in service sector that also contributed more in GDP of developing as well as least developed countries. And also we can conclude that the performance of IT sector and service sector is different much different in GDP contribution of developing countries and least developed countries.

5. Conclusion

Developmental processes usually coincide with a growing role of services in the economy which goes alongside with a reduced role for agriculture. The service sector and its components like IT software can be said as one of the significant component of any country's economy. Day by day the role and share of service sector and IT software is increasing in the GDP of world economy.

We found that, in developing countries from 2000s to 2017s the total value added of service sector and IT software were 168.19 trillion dollars and 102.62 trillion dollars, respectively, and the total GDP in value added in this period of time was 314.59 trillion dollars that shows an average of 53 percent share of service sector in GDP and 32.6 percent IT sector in GDP growth of all developing countries. On the other hand, from 2000s to 2017s the total value added of service sector and IT sector in least developed countries was 4.78 trillion dollars and 2.29 trillion dollars, and the total GDP in value added in this period of time was 10.16 trillion dollars that shows an average of 47.02 percent share of service sector in GDP and 22.57 percent IT sector in GDP growth of all least developed countries.

And also as per findings, among the selected African, East Asian, South Asian, Western Asian, and Latin American developing countries these countries; South Africa with 68.57 percent and 43.68 percent share, Singapore with 75.19 percent and 44.04 percent share, Sri Lanka with 61.37 percent and 34.92 percent share, Turkey and Brazil with 60.23 percent, 32.30 percent share and 72.24 percent, 8.24 percent share, respectively, had the highest share of service sector and IT sector respectively in their GDP growth by the region in 2017. Besides, the highest share of IT sector in service sector were in these developing countries; Libya with 74.51 percent, China with 68.50 percent, Iran (Islamic Republic) with 58.41 percent, Kuwait with 77.74, and Brazil with 66.77 percent shares, in 2017s. On the other hand, the highest share of service sector and IT sector in GDP growth were in these least developed countries; Madagascar with 58.76 percent and 31.84 percent share, Vanuatu with 65.53 percent and 32.45 percent share, Bangladesh with 56.50 percent and 32.42 percent share, Yemen with 57.57 percent and 25.93 percent share and Haiti with 49.96 percent and 7.95 percent share, respectively, in each region in 2017.

From these data we can conclude that, the average share of service sector and IT sector is higher in developing countries than the least developed countries, and as per the data, the performance of these sectors are much higher in developing countries than the least developed countries.

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