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Global IT/IT Enabled Services and ICT Industry: Growth & Determinants

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Abstract

The IT/ITeS/ICT industry is the world's best face depicting the seamless connectedness of the world. Distance is very casually and seamlessly conquered by the hardware, software, fine-ware and brain-ware components of the IT/ITeS/ICT industry. The global Information Technology (IT) industry has come of age, yet new applications and devices continue to emerge. We may be tempted to say the business models are in the maturity phase evidenced by slowing innovation, growth if any coming by operational edges than through inventive edges. Further organic growth is conspicuous by absence, but growth by merger and acquisition is becoming the order. However, it is the IT, more than any other industry has an increased productivity, particularly in the developed world, and therefore is a key driver of global economic growth, world over. The ICT industry is expected to grow 3.8% in 2015 over 2014 according to the International Data Corporation (IDC), the premier global provider of market intelligence, advisory services, and events for the information technology, telecommunications and consumer technology markets. Global GDP and Global Service GDP are better predictors of ICT industry. While verticals show growth through economies of scale, horizontals need a big push in terms of next generation technology. This research paper gives an analysis of the growth and determinants of growth global IT Industry with appropriate testing of hypotheses.

Keywords: *Application Services, Engineering Services, Information Technology-enabled Services (ITeS) Business Process Services, Business Process Out-sourcing, Business Process Management, Engineering & R&D, Internet & Mobility, Convergence of technologies, etc.*

1. Introduction

The global Information Technology (IT) industry has come of age, yet new applications and devices continue to emerge. We may be tempted to say the business models are in the maturity phase evidenced by slowing innovation, growth if any coming by operational edges than through inventive edges. Further organic growth is conspicuous by absence, but growth by merger and acquisition is becoming the order. However, it is the IT, more than any other industry has an increased productivity, particularly in the developed world, and therefore is a key driver of global economic growth, world over. This research paper gives an analysis of the growth and determinants of growth global IT Industry with appropriate testing of hypotheses.

2. Objectives and Hypotheses of the Study

The study has set the following objectives for in-depth analysis.

i. To present the trend in IT/ITeS and ICT industry growth in absolute terms along with certain chosen global development indicators like the Global GDP (GGDP), Global Service Sector GDP (GSGDP) and USA's GDP.
ii. To examine the relative share of IT/ITeS and ICT industry in the GGDP, GSGDP and USA's GDP, besides the inter se relative share of IT/ITeS in ICT total.
iii. To study the ordinary least square (OLS) relationship of IT/ITeS individually on Time Scalar, on GGDP, GSGDP, ICT and USGDP.
iv. To study the multiple regression relation of IT/ITeS on Time Scalar, on GGDP, GSGDP, ICT and USGDP taken together.
v. To discern the trend in the vertical and horizontal market segments.

The hypotheses emanate from the 3rd and 4th objectives of the study testing the significance of regression relationship.

Period of the Study: The study covers a period of 25 years, beginning 1992 and extending to 2014, with data points for 18 years.

Data for the Study: The data for the study are principally secondary. Data from multiple sources are used, access made with the Web medium.

Tools of analysis: OLS and MLR measures are adopted. CAGR is also used.

3. Concept Contours

'Information Technology (IT) industry or the Information Communication Technology (ICT) industry is defined by the Information Technology Association of America, as the design, development, implementation and management of computer-based information devices, systems, software applications and computer hardware'[1]. Today, it has grown to cover most aspects of computing devices and operant technology. While hardware gamut

poses no problem of understanding, the software and services side does pose grasping problem and hence warrant demarcation.

The gamut of IT Services includes 'Application Services' and 'Engineering Services'. The Information Technology-enabled Services (ITeS) industry provides services that are delivered over telecom or data network to a range of external business areas. The gamut of ITeS covers the 'Business Process Services', inclusive of Business Process Out-sourcing (BPO) and Business Process Management (BPM), covering customer service, web-content development, back office management and network consultancy etc. 'The IT and ITeS firms offer wide spectrum of IT services across different vertical segments, Business Process Management (BPM), Engineering & R&D, Internet & Mobility and software products. Convergence of technologies is expanding the scope of IT and ITeS.

Cloud computing, SaaS, PaaS, IaaS, mobility, social media, business analytics and the like present opportunities for the industry to build new solutions, re-architect existing platforms and target new customer segments like the small and medium businesses. The emphasis has now shifted to specialist providers across different aspects of the cloud- SaaS (Software as a Service), PaaS (Platform as a service), IaaS (Infrastructure as a service), public, private, community and hybrid cloud, and others[2]'. Software is classified in heading 8523 of the Harmonized System of World Customs Organization (WCO).

3.1 No Consensus on Concepts

The concepts of IT services, IT Enables services, ICT and related terms as followed by leading IT research bodies and institutions like the **Gartner, Inc., Stamford, Connecticut,** a American information technology research and advisory, the **International Data Corporation (IDC), Framingham, Massachusetts,** another USA based global provider of market intelligence/advisory/event services for the information technology, telecommunications and consumer technology markets, the **World Information Technology and Services Alliance (WITSA)**, Vienna, a consortium of over 60 information technology (IT) industry associations from economies around the world and a global voice of the IT industry, and by others institutions differ, leading to a wide diversity in estimates and forecasts global of IT and ITeS production or market or industry size. Researchers need to good nerved to be at grip.

ITeS consists broadly of the whole gamut of business and technical services that can be outsourced, including 'customer interaction services, including call centers', 'back office operations, plus revenue accounting, data entry (including finance and accounting) and human resource services such as payroll processing', 'transcription and translation services', 'content development, including animation, design and geographic information systems' and 'other services, including engineering services, legal database, website services, online education,

online or offline or remote-line Human Resource services involving IT features, data digitization, research and development and so on.

3.2 Philippines' Business Processing Association Model and World Bank's Adoption

The sub-components of each major and co-components of IT/ITeS are as in table 1 below sourced from Business Processing Association of the Philippines, adopted by the World Bank. Table 1 show that the IT services have two major divisions, namely Application and Engineering services. The IT application services include application development & maintenance, system integration, IT infrastructure and consulting. The Engineering services include up-stream and down stream engineering, software, plant and product IT engineering. ITeS include Business Process services comprising horizontals, verticals and knowledge process outsourcing (KPO).

Table 1: Software and Services: IT Services and IT-enabled Services (IT & ITeS)

IT Services		**IT-enabled Services**
. Application Services	**. Engineering Services**	**. Business Process Services**
Application development and maintenance Application development Application development ntegration and testing Application maintenance **i. System integration** Analysis Design Development Integration and testing Package implementation **ii. IT infrastructure services** Help desks Desktop support Data center services Mainframe support Network operations **v. Consulting** IT consulting Network consulting	**Manufacturing ngineering** **. Upstream product ngineering** Concept design Simulation Design engineering **. Downstream product ngineering** Computer aided design, manufacture and engineering Embedded software Localization **. Plant and process Engineering** **l. Software product levelopment** Product development System testing Porting/variants Localization Maintenance and upport Gaming	**Horizontal processes** Customer interaction and upport (including call centers) Human resource management Finance and administration Supply chain (procurement logistics management) **i. Vertical processes** Banking Insurance Travel Manufacturing Telecommunications Pharmaceuticals Other **ii. Knowledge process out ourcing** Business and financial Research Animation Data analytics Legal process and patent Research Other high end processes

Source: Adapted by World Bank, from Business Processing Association of the Philippines (BPAP) 2007, http://siteresources.worldbank.org/extinformationandcommunicationandtechnologies/Resources/282822-1208273252769/The_ Global_Opportunity_in_IT-Based_Services.pdf(Access 24th Apr. 2012).

4. Global Scenario of IT/ITeS and ICT

The global IT services industry comprises services related to the application of business and technical expertise to enable organizations to create, manage, optimize, and access information and business processes. The industry's scope includes product support services

such as maintenance of hardware and software and offering professional services such as IT consulting, development, and integration services. Advances in IT and global connectivity, combined with waves of economic liberalization, have given impetus to a new dimension of globalization: cross-border trade in software and services, i.e., IT services and IT-enabled Services (ITeS). Much of the data on the size of the current market comes from private surveys, consulting firms, and anecdotal evidence.

According to **McKinsey**[3], market in 2007 for IT services and ITeS stood at $475 billion and at $500 billion in 2008. Another research firm, **Research and Markets**[4], placed the market at $ 1183bn in 2011 and forecasted the same at $1550bn in 2016. The value was put at $1160bn for 2012 by **Gartner Inc.**[5]

The **World Economic Forum**[6] (WEF) reported the size for 2010 and 2014 at $1120bn and $1310bn. No one source could be depended on as in the public domain only patchy data are. The **OECD** data, based on **IDC**, in its Information Technology Outlook 2000 gave estimates of ICT and IT/ITES at $1.595tn and $0.362tn for 1997.

World Information Technology and Services Alliance, in its publication **Digital Planet Executive Summary, 2010** with research support by **HIS Global Insight Inc**., gave actual and forecast values on **ICT, IT/ ITeS**, etc in graphical presentations. From the graphs relevant data on global **IT/ ITeS and ICT** are discerned out, computed and presented. **Global Service GDP** are computed from **Global GDP (GGDP)** by applying percent share of the service sector, year-by-year. **Gartner Inc** has given forecast data for 2013 and 2014. Similarly **Asia Cloud Forum** has given data from 2012-14, actual and forecast. From these data sources relevant data are picked out. The readers may appreciate the need for piecing together information from different sources to construct data on a continuous basis for a longer span of time in the absence of relevant information. There could be paid sources of information. But the researcher depended on alternative sources of information.

4.1 Global IT/and IT-enabled Services and ICT Overall Trend

Global trends in IT/ITeS/ICT and the global macroeconomic factors like the Global GDP and global SGDP, and the USGDP are dealt now from data that were strenuously collected from diverse sources. Besides absolute figures, YoY change, CAGR, percent share of IT/ITeS/ICT over Global GDP and global SGDP, and the USGDP are presented. Table 2 gives the data thus 'mined' out and also worked out information.

Table 2 reveals the absolute and relative sizes of the global IT/ITeS sector and global ICT industry. From $0.31tn in 1992 the global IT/ITeS sector reached $1tn mark in 2006, $2tn mark in 2012, and is estimated to be at $2.19tn by 2014. The global ICT industry registered steady rise from $1.31tn in 1992 to $3.18tn in 2006 and estimated at 3.88 in 2014. The CAGR in IT/ITeS sector amounted to the highest of 9.76%. This is a spectacular rate given over two decades period. The ICT industry as a whole grew 5.31%. The GGDP, GSGDP and USGDP

recorded respectively, 5.61 %5.55% and 4.73% CAGR during the study period of 1992 through 2014.

Table 2: Global IT/ITeS, GDP & SGDP and USGDP (US $ Trillion)

Year	Global						USA GDP	Percentage Share of:				
	IT/ITES		ICT		GDP (GGDP)	Service GDP (GSGDP)		IT/ITES to		ICT to		IT/ ITES
	Sum	YoY Gr. %	Sum	YoY Gr. %				GGDP	GSGDP	GGDP	GSGDP	To ICT
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
1992	0.31	--	1.31	--	24.11	15.89	6.26	1.29	5.43	1.95	8.24	23.66
1997	0.36	16.13	1.59	21.37	30.33	20.02	8.26	1.19	5.24	1.80	7.94	22.64
1999	0.48	33.33	2.03	27.67	31.34	21.00	9.30	1.53	6.48	2.29	9.67	23.65
2000	0.54	12.50	2.26	11.33	32.35	21.93	9.99	1.67	6.99	2.46	10.31	23.89
2001	0.50	-7.41	2.21	-2.21	32.16	21.90	10.23	1.55	6.87	2.28	10.09	22.62
2002	0.56	12.00	2.23	0.90	33.41	22.72	10.59	1.68	6.67	2.46	9.82	25.11
2003	0.60	7.14	2.41	8.07	37.59	25.37	11.09	1.60	6.41	2.36	9.50	24.90
2004	0.83	38.33	2.73	13.28	42.30	28.72	11.80	1.96	6.45	2.89	9.51	30.40
2005	0.94	13.25	2.94	7.69	45.74	31.15	12.56	2.06	6.43	3.02	9.44	31.97
2006	1.00	6.38	3.18	8.16	49.56	33.75	13.31	2.02	6.42	2.96	9.42	31.45
2007	1.05	5.00	3.29	3.46	55.91	38.30	13.96	1.88	5.88	2.74	8.59	31.91
2008	1.41	34.29	3.37	2.43	61.38	42.41	14.22	2.30	5.49	3.32	7.95	41.84
2009	1.33	-5.67	3.22	-4.45	58.13	41.21	13.9	2.29	5.54	3.23	7.81	41.30
2010	1.39	4.51	3.36	4.35	63.51	44.39	14.42	2.19	5.29	3.13	7.57	41.37
2011	1.88	35.25	3.54	5.36	70.44	47.55	14.99	2.67	5.03	3.95	7.44	53.11
2012	2.01	6.91	3.65	3.11	71.92	45.81	15.68	2.79	5.08	4.39	7.97	55.07
2013	2.06	2.49	3.72	1.92	73.54	47.07	16.15	2.80	5.06	4.38	7.90	55.38
2015e	2.19	6.31	3.88	4.30	75.82	49.42	16.52	2.89	5.12	4.43	7.85	56.44
CAGR	9.76 %	--	5.31 %	--	5.61 %	5.55%	4.73 %	-	-	-	-	-

Sources: Complied, Constructed and Computed from many IT Research Firms from their web-data.

Notes: ICT is inclusive of IT/ITES. GGDP is inclusive of GSGDP.

i. World Information Technology and Services Alliance, Digital Planet Issues, 2000, 2008 and 2010, http://www.witsa.org/papers/wtomin3.pdf

ii. http://www.google.co.in/publicdata/explore?ds=d5bncppjof8f9_&met_y=ny_gdp_mktp_cd&hl=en&dl=en&idim=country:USA:CHN:DEU

iii. http://www.wto.org/english/res_e/statis_e/services_training_module_e.pdf

iv. http://data.worldbank.org/indicator/NV.SRV.TETC.ZS/countries?display=graph

v. Global Economic Outlook, The Conference Board, http://www.conference-board.org/data/ global outlook.cfm

vi. Gartner Inc., Eaham, UK, 21, Jan, 2010, http://www.gartner.com/newsroom/id/1284813

vii. http://www.asiacloudforum.com/content/gartner-worldwide-it-spending-reach-37t-2013

The year-on-year (YoY) growth rates happen to be following a pattern. High growth and dull (negative) growth alternate. The dull (negative) growth periods are invariably periods of industry trouble like the dot.com bust of the 2001 or the global meltdown of the 2009. **A significant trend is the share of IT/ITeS to GGDP and that of ICT to GGDP is rising almost consistently, from 1.29% and 1.95% in 1992 to 2.80% and 4.38% in 2013.** But their share in GSGDP is seen with ups and downs. This means the non-IT/ITeS/ICT services are also competing with IT/ITeS/ICT services, surpassing during some years and losing during rest of the years against IT/ITeS/ICT services.

Within ICT subsets, the IT/ITeS subset is growing fast and that its share on the ICT is raising from just about 24% to about 57% during the period of study. This is a significant 140% rise in percent share of IT/ITeS sector in the total ICT sector. One reason for the grand rise in share of IT/ITeS sector is that ICT sector is moving into service provider rather than device seller. Instead of device sale, service from the device is offered at a price. Table 2 also gives the Global GDP (GGDP), US GDP and Global Service GDP (GSGDP). The influence of all these on the global spend level of IT/ITeS is tested through simple, general and multiple regression analyses.

5. Regressed Relationship Analysis of Global IT/ITES with Macro Factors

One of the purposes of the research is to establish relationship between time-scale and global IT/ITeS, between global IT/ITeS and global ICT spend levels and also between the global macro-economic factors namely the GGDP, GSGDP, ICT and USGDP on the one hand and the IT/ITeS on the other.. The regression results are given in table 3.

i. Time series relationship between time-scale and the global IT/ITES

The time series relationship between time-scale and the global IT/ITeS spend is studied first. Significant time scalar effect is found with annual increment at 0.114 with constant factor almost zero. The aggregate predicted amount comes to $2.051tn for 2014, while the actual amount is $2.19tn. The model explains 93.9% of the variation in the global IT/ITeS spend level. The ANOVA confirms the significance of relationship with p-value 0.000.

ii. Regression relationship between global ICT and the global IT/ITES

The Regression relationship between global ICT and the global IT/ITeS spend levels is studied. Significant relationship is found with beta= $0.759tn. The model explains 85% of the variations in the global IT/ITeS spend level, caused by global ICT. The ANOVA confirms the significance of relationship with p-value 0.000.

iii. Regression of IT/ITES with GGDP and with GSGDP

The Regression of IT/ITeS with GGDP produced a prediction level of 96.5%, with both the constant and predictor variable highly significant. It is true that global well being directly impacts the IT/ITeS orientation of people, leading to high level of spending on IT/ITeS.

The Regression of IT/ITeS with GSGDP resulted in a predictive ability of 92.6%, with both the constant and predictor variable being highly significant. It is true that Global Service GDP has an overwhelming influence of global IT/ITeS spend level. Between USGDP and IT/ITeS global spend level; the regression resulted in predicting 86% global of IT/ITeS spending.

Table 3: Relationship Analysis of Global IT/ITeS with Global Macro Economic Factors

Regression Analysis: IT/ITeS versus Time Scalar

The regression equation is: IT/ITeS = - 0.0010 + 0.114 Time Scalar

Predictor	Coef	SE Coef	T	P
Constant	-0.00098	0.07592	-0.01	0.990
Time Scalar	0.113787	0.007013	16.22	0.000

S = 0.154374 R-Sq = 94.3% R-Sq(adj) = 93.9%. The relationship is significant

Analysis of Variance

Source	DF	SS	MS	F	P
Regression	1	6.2731	6.2731	263.23	0.000
Residual Error	16	0.3813	0.0238		
Total	17	6.6544			

Regression Analysis: IT/ITeS versus ICT

The regression equation is: IT/ITeS = - 1.07 + 0.759 ICT

Predictor	Coef	SE Coef	T	P
Constant	-1.0663	0.2283	-4.67	0.000
ICT	0.75871	0.07806	9.72 0.000	

S = 0.245438 R-Sq = 85.5% R-Sq(adj) = 84.6%

Analysis of Variance

Source	DF	SS	MS	F	P
Regression	1	5.6906	5.6906	94.47	0.000
Residual Error	16	0.9638	0.0602		
Total	17	6.6544			

Regression Analysis: IT/ITeS versus GGDP

The regression equation is: IT/ITeS = - 0.681 + 0.0356 GGDP

Predictor	Coef	SE Coef	T	P
Constant	-0.68081	0.08604	-7.91	0.000
GGDP	0.035630	0.001649	21.61	0.000

S = 0.117360 R-Sq = 96.7% R-Sq(adj) = 96.5%

Analysis of Variance

Source	DF	SS	MS	F	
Regression	1	6.4340	6.4340	467.14	0
Residual Error	16	0.2204	0.0138		
Total	17	6.6544			

Regression Analysis: IT/ITeS versus GSGDP

The regression equation is: IT/ITeS = - 0.687 + 0.0531 GSGDP

Predictor	Coef	SE Coef	T	P
Constant	-0.6867	0.1275	-5.38	0.000
GSGDP	0.053125	0.003639	14.60	0.000

S = 0.170440 R-Sq = 93.0% R-Sq(adj) = 92.6%

Analysis of Variance

Source	DF	SS	MS	F	
Regression	1	6.1896	6.1896	213.07	0

Residual Error	16	0.4648	0.0290			
Total	17	6.6544				

Regression Analysis: IT/ITeS versus USGDP

The regression equation is:IT/ITeS = - 1.43 + 0.202 USGDP

Predictor	Coef	SE Coef	T	P
Constant	-1.4291	0.2465	-5.80	0.0
USGDP	0.20232	0.01938	10.44	0.0

S = 0.230775 R-Sq = 87.2% R-Sq(adj) = 86.4%

Analysis of Variance

Source	DF	SS	MS	F	P
Regression	1	5.8023	5.8023	108.95	0.000
Residual Error	16	0.8521	0.0533		
Total	17	6.6544			

Multiple Regression Analysis: IT/ITeS versus USGDP, GSGDP, GGDP, ICT

The regression equation is

IT/ITeS = - 0.471 - 0.0504 USGDP - 0.0711 GSGDP + 0.0858 GGDP + 0.107 ICT

Predictor	Coef	SE Coef	T	P
Constant	-0.4712	0.1850	-2.55	0.02
USGDP	-0.05045	0.08025	-0.63	0.54
GSGDP	-0.07111	0.01990	-3.57	0.00
GGDP	0.08576	0.01271	6.75	0.00
ICT	0.1073	0.2935	0.37	0.72

S = 0.0856188 R-Sq = 98.6% R-Sq(adj) = 98.1%

Analysis of Variance

Source	DF	SS	MS	F	P
Regression	4	6.5591	1.6398	223.69	0.000
Residual Error	13	0.0953	0.0073		
Total	17	6.6544			

Source	DF	Seq SS
USGDP	1	5.8023
GSGDP	1	0.3875
GGDP	1	0.3684
ICT	1	0.0010

Best Subsets Regression: IT/ITES versus ICT, GGDP, GSGDP, USGDP

Response is IT/ITES

Variables	R-Sq	R-Sq(adj)	Cp	S	ICT	GGDP	GSGDP	USGDP
1	96.7	96.5	16.1	0.11736		X		
1	93.0	92.6	49.4	0.17044			X	
2	98.5	98.3	1.8	0.082086		X	X	
2	97.1	96.8	13.9	0.11247	X	X		
3	98.6	98.2	3.1	0.082927		X	X	X
3	98.5	98.2	3.4	0.083749	X	X	X	
4	98.6	98.1	5.0	0.085619	X	X	X	X

Multiple regression of global IT/ITeS with Global GDP, Global Service GDP, USGDP and Global ICT spend was done and the model turned out to be significant, with the highest R-square of 98.1%. Best sub-set regression analysis shows, the GGDP and GSGDP as independent variables could predict 98.3%, making other independent variables almost redundant.

6. Scenario of Global Software and Services: Composition and Trend thereof

There are interesting revelations of global IT/ITES/ICT industry. Details by technology-class of the global IT/ITeS/ICT spending, classification of spending by major types, Consumer and Business, ICT spending at the global level by industry segment, ICT spending by major regions of the world and factors affecting global ICT spending are dealt based on data extracted from exhibits provided by the WITSA, Digital Planet, 2010.

In the ICT industry, Communication, (tele-communication) was the largest single item of expenditure at the global level, followed by IT services, IT hardware and IT software, in that order. Hardware isn't rising swiftly. Software is also not rising fast enough in value terms. Both remain dwarfed. While software could show just around 50% growth in 10 years, communication rose more than 80% during the same period. The tele-density has risen hugely world over with people on connect-mode, connect-duration and connect-device in operation ever on the rise. The programmed communication is there on the rise swiftly in advanced sectors.

The global growth of telecom is revealed by the increase in the number of subscriptions[7] of fixed/mobile telephone and wired/mobile broad-band per 100 inhabitants from 53 connections in 2005 to 153 connections in 2013; close to reach a three-fold size in just 8 years. Computing and telecom are in a great union making the world info-com.

The global IT/ITeS/ICT spending by the combine 'business-government' segment stood at about twice that of the consumer or household spending on IT/ITeS/ICT. It is quite expected that way only. Yet consumer spending growth rate is slightly higher at 80% in eight years, while the other's spending grew about 70% only during the period under study.

The industry-class-wise crossed with technology-wise components of global spending on IT/ITES/ICT gives further details of trend. In the vertical market segments where the emphasize is on custom-designed IT/ITeS, Financial services topped the list, followed by Government, Computer services, Manufacturing, Telecom, Transportation and so on. Financial Services industry used more of IT services, than hardware or communication or software, while Transportation used more of communication component. Spending on communication was the largest single item for all verticals, except financials and education, where perhaps, spending on computer services is highest by proportion to total spending. Automation, remote management, RFID for cargo/inventory tracking, e-governance, e-defense, point of sale/purchase inventory management, smart networks, e-procurement, payment systems, remote-medical consultancy/ treatment through virtual clinic/ward, etc are ways of 'infomatics' depended on by the varied user groups.

7. Conclusion

The IT/ITeS/ICT industry is the world's best face depicting the connectedness of the world. Distance is very casually and seamlessly conquered by the hardware, software, fine-ware and brain-ware of the IT/ITeS/ICT industry. The ICT industry is expected to grow 3.8% in 2015 over 2014 according to the International Data Corporation (IDC), the premier global provider of market intelligence, advisory services, and events for the information technology, telecommunications and consumer technology markets. Global GDP and Global Service GDP are better predictors of ICT industry. While verticals show growth through economies of scale, horizontals need a big push in terms of next generation technology.

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