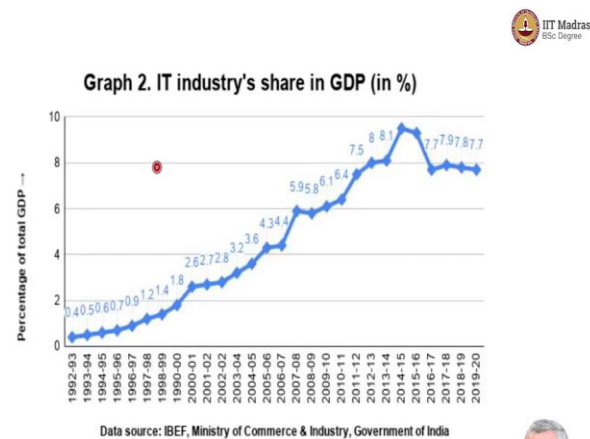


**Business Data Management**  
**Professor G Venkatesh**  
**Professor M Suresh Babu**  
**Department of Humanities and Social Sciences**  
**Indian Institute of Technology, Madras**  
**Information Technology Industry and Summary**

Professor G Venkatesh: Now our favourite IT industry.

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Professor G Venkatesh: IT industry represents 7 odd percent of India's GDP. Which is almost equal to auto sector.

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2019 Global Software Outsourcing Rates

Title of Full Time Employee (FTE)	United States	Latin America	Eastern Europe	Asia
Business Analyst	\$110 - \$205	\$45 - \$55	\$40 - \$63	\$30 - \$42
Architect	\$196 - \$292	\$60 - \$72	\$50 - \$77	\$35 - \$48
Project Manager	\$133 - \$233	\$55 - \$66	\$45 - \$70	\$35 - \$48
Jr. Developer	\$105 - \$111	\$35 - \$44	\$25 - \$42	\$18 - \$24
Mid-level Developer	\$132 - \$140	\$30 - \$32	\$35 - \$56	\$24 - \$35
Lead Developer	\$178 - \$187	\$50 - \$61	\$45 - \$70	\$30 - \$42
Sr. Developer	\$154 - \$163	\$45 - \$55	\$45 - \$70	\$30 - \$42
Junior QA	\$77 - \$81	\$30 - \$38	\$25 - \$42	\$15 - \$24
Mid-level QA	\$99 - \$105	\$35 - \$44	\$30 - \$49	\$20 - \$30
Senior QA	\$143 - \$169	\$40 - \$50	\$40 - \$63	\$25 - \$36
Graphic Designer	\$79 - \$163	\$40 - \$50	\$35 - \$56	\$25 - \$36

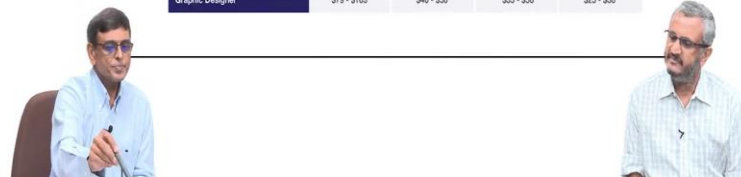


Exhibit 1: Digital technology to drive multi-year growth

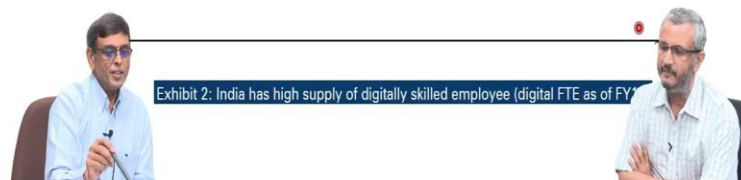
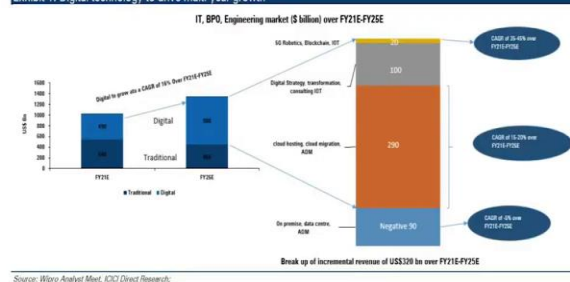


Exhibit 2: India has high supply of digitally skilled employee (digital FTE as of FY

This chart we have already seen, says basically that driver growth is going to be cost arbitrage.

Professor M Suresh Babu: Cost arbitrage.

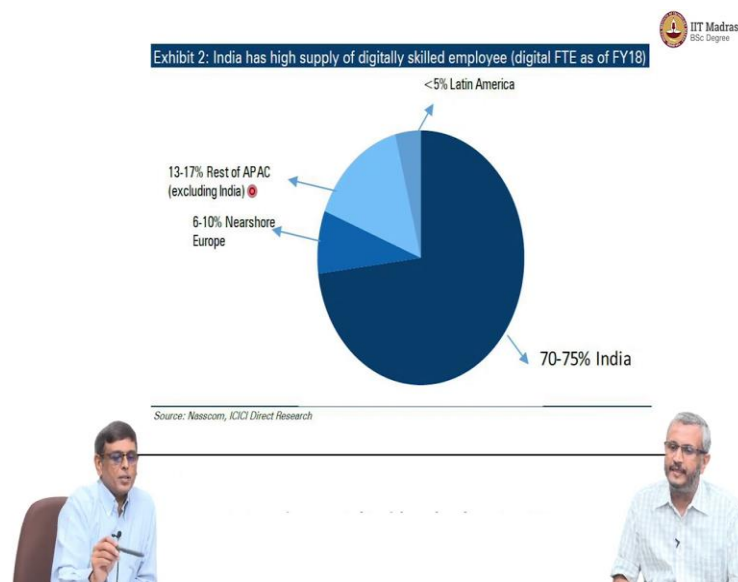
Professor G Venkatesh: But, besides this cost arbitrage, the fact that we are cost competitive, there is a new vector that India is trying to position itself, increasing value, we are a value provider. And today the measure of value is in this business called Digital, how good are you in digital?

So, and the reason for that is that the expectation that over the next 4 or 5 years or even next 10 years, traditional IT is actually going to decline, and digital is going to take place, and if you break down the digital it is like this, you know cloud, share, cloud migration, digital transfer, implementing digital strategies, for companies, are all growing.

Professor M Suresh Babu: Fantastic.

Professor G Venkatesh: And so, you can see that this has CAGR 15 to 20 and so this segment is digital is where India has a potential to increase its value, be on a high value. We have been doing well because we have been getting a lot of business, but how can we do much higher premium businesses, by using digital as the tool.

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That is the question and the reason why the analysts think that India is going to be a great place for digital is because if you look at the digitally trained employees, like this student who will graduate from our program, they will have knowledge of data science, 70 to 75 percent of the skills are going to come from India.

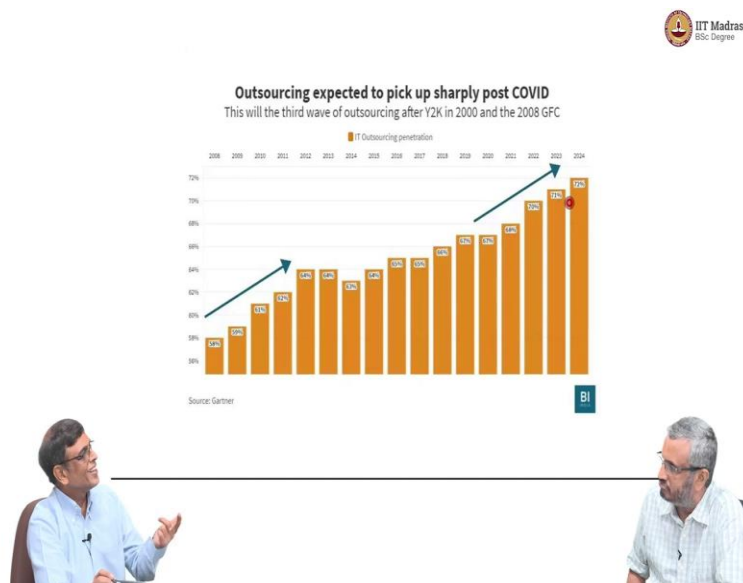
Professor M Suresh Babu: Fantastic.

Professor G Venkatesh: Only 5 percent come from Latin America.

Professor G Venkatesh: So, we are going to be the biggest pool of digitally trained researchers in the world, that's nobody else can.

Professor M Suresh Babu: That is a very positive thing.

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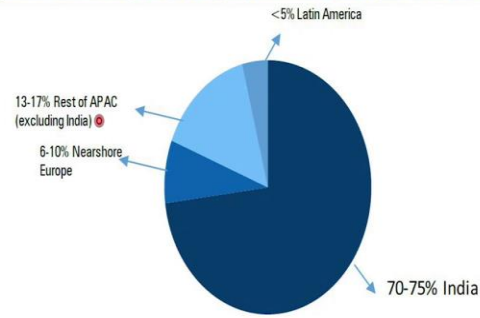


Professor G Venkatesh: And also there expectations that outsourcing, outsourcing basically means that instead of doing in the house, you do it with a third party contract, it is already quite high, if you see for example the outsourcing percentage has been around 60 percent, so 60 percent IT work in companies Fortune 500 companies is done by external people and that is expected to go to even 70 percent.

So, outsourcing is going to increase and we saw the billing rate advantages for India, offshoring, which means sending it to India will also increase, so these two vectors together, outsourcing and offshoring means that India can expect to see a fairly large volume of work coming our way, in addition to the fact that they are going to also move up the value curve because we are going digital.

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Exhibit 2: India has high supply of digitally skilled employee (digital FTE as of FY18)

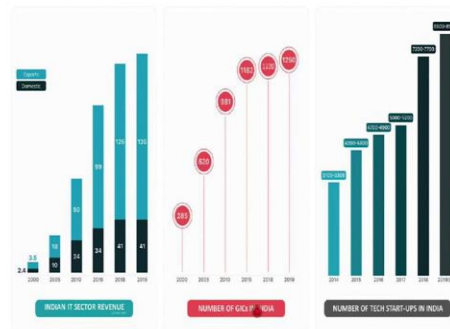


Source: Nasscom, ICICI Direct Research



Professor G Venkatesh: So, these are the vectors.

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Source: CACM 2019



So, I think this is a chart which shows Revenues.

Professor G Venkatesh: Somebody else wrote in CACL, this part is an interesting chart, how the revenues are grown?

This is the number of global innovation centres, GIC is Global Innovation Center, companies for multinational companies who set up operations in India to do RND work, IT work, or RND work, or support work, BPO work, which is also considered part of KPO.

Professor G Venkatesh; KPO is Knowledge Process Outsourcing comprising BPO Business Process Outsourcing, so BPO has many segments, so call centre being the lowest value.

Professor M Suresh Babu: The lowest.

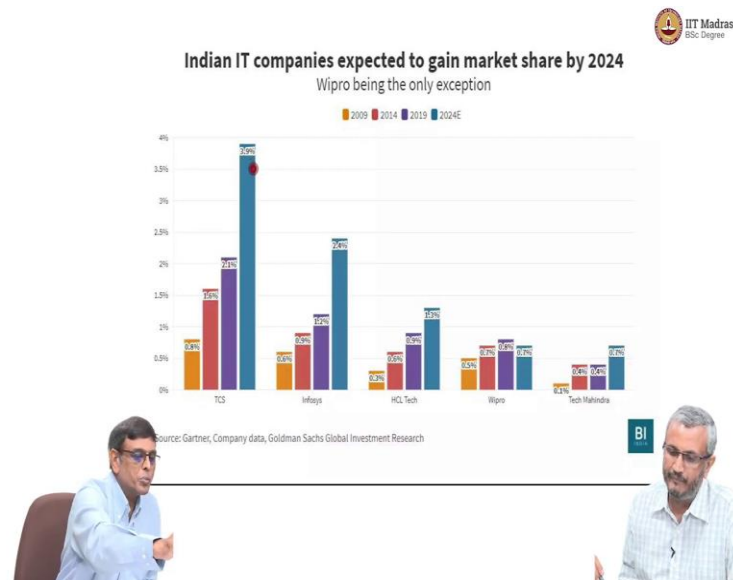
Professor G Venkatesh: And KPO being at a higher level.

Professor G Venkatesh: So, GIC, so global innovation centres basically are the foreign companies with Indian centres, to do R&D or IT work. And this work basically, you can see the number of centres that have come up, in the last from 2000 it was only 285 has gone to 1000, so very large number of people are coming.

Professor M Suresh Babu: Phenomenal.

Professor G Venkatesh: And start-ups also, so these three pictures tell you the three ways in which IT is contributing.

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You can see also that the market share, worldwide market share for TCS is 2.0 – 2.4.

Professor G Venkatesh: Is going to become 3.9 percent, we saw that you know one of the earlier charts I showed you 1.6 percent, well that is old, so in '19 it is already 2.1 percent as shown, now it is going to 3.9 percent, it is going to increase. So, also Infosys, also TCS, in fact, actually this Wipro chart is also, I do not think it is correct, it will also show increase.

Professor M Suresh Babu: Increasing.

Professor G Venkatesh: So, they are all showing increases, because we are taking away work in some sense from the established player, because of our cost advantages.

Professor M Suresh Babu: Cost advantages.

Professor G Venkatesh: Ability to mobilize digitally trained workers.

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**Double-digit revenue growth projected over the next three years**  
TCS and Infosys have the most to gain with growth crossing 14%



Professor G Venkatesh: And therefore, double digit revenue growth is possible. So, that is basically our analysis of an IT industry. We do not look too much at cost, of course, we can look at costs, but these are companies operating at 20 percent profit, IROCE and there was hardly any cost. So, there is nothing much to look at it from those levers.

You have to look at growth basically on this. So, the growth is going to come by more outsourcing, offshoring and more digital, these are the high growth sectors.

Professor M Suresh Babu: And the conventional kind of segregation of costs, like in manufacturing is not applicable to services industry. So that is very useful analysis because now we have firm level analysis, then we have an industry level analysis, so we have a kind of comprehensive picture of how data is used in terms of assessing firm performance as well as industry performance.

Professor G Venkatesh: Industry performance. And how can you present it?

We should Present it nicely in charts, the right kind of charts.

Professor M Suresh Babu: And that is the main point that we want to emphasize in these two sessions.



Professor G Venkatesh: You want to tell a story or don't tell the story well.

Professor M Suresh Babu: Data is there everywhere. Data is the new oil.

Professor M Suresh Babu: But you have to pick the data and present it correctly.

Professor G Venkatesh: we need to present it in the form of a storyline, if something is going on what is the underlying insight, what insight do we have by looking at this data and how does that insight help us to get informed decisions, where to invest, what to do, whether to use your cash how to use your cash, whether to retrieve that, how to do.

Professor M Suresh Babu: And in terms of getting that story in line is where our discussions in terms of our conceptual concepts of cost and production, helps us.