

Tech Services and Software Accounting System in Derivative Trading – An Overview

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Abstract

This paper looks at analyzing the tech companies National Stock Exchange of India is one of the leading exchanges in the world on several key parameters. At the beginning of a new decade, these lines from the play *Inherit the Wind* seem as appropriate for the technology industry as they did for the debate over evolution taking place in the drama. The challenge itself is not unique—every industry deals with this tension as it becomes more mature—but the new variables here are the scale that tech is able to achieve and the evolutionary aspect of mixing digital and physical worlds. This has obviously been an upward trend for several years. But one of the more interesting consequences of this trend is somewhat longer sales cycles for many in the channel.

The answers to these questions come from combining technical expertise with social awareness. By embracing responsibility for all the changes innovation can bring, the tech industry can be responsible for driving future progress. The global information technology industry is on pace to reach \$5.2 trillion in 2014, according to the research consultancy IDC. The enormity of the industry is a function of many of the trends discussed in this report. Economies, jobs, and personal lives are becoming more digital, more connected, and more automated. Waves of innovation build over time, powering the technology growth engine that appears to be on the cusp of another major step forward. There are a number of taxonomies for depicting the information technology space. Using the conventional approach, the industry market can be categorized into five top level buckets. The traditional categories of hardware, software and services account for 56% of the global total. The other core category, telecom services, accounts for 26%. The remaining 17% covers various emerging technologies that either don't fit into one of the traditional buckets or span multiple categories, which is the case for many emerging 'as-a-service' solutions that include elements of hardware, software, and service, such as IoT, drones, and many automating technologies. The IT industry in India is a key part of the country's economy. In 2014, information technology and its various subsectors represented almost eight percent of the nation's overall GDP. In financial year 2014, this industry in India generated an annual revenue close to 180 billion Indian dollars, a significant increase from the generated revenue ten years ago. A majority of this revenue was generated in exports while domestic revenue totaled to less than 50 billion dollars for the mentioned period.

Key words: IT, industry, tech, IoT, India, GDP, NSE, hardware, software, and service.

Introduction

Despite the size of the Indian market, the majority of technology spending (68%) occurs beyond its borders. Spending is often correlated with factors such as population, GDP, and market maturity. It's time for the industry to take the next step. There are tremendous benefits available through technology for both business and society, but there are major questions around safety, privacy, sustainability, and trust. The tech industry is faced with a tricky balancing act: continuing to drive innovative solutions while grappling with the side effects of those solutions in the global economy.

Among global regions, western Europe remains a significant contributor, accounting for approximately one of every five technology dollars spent worldwide. However, as far as individual countries go, China has clearly established itself as a major player in the global tech market. China has followed a pattern that can also be seen in developing regions, where there is a twofold effect of closing the gap in categories such as IT infrastructure, software, and services, along with staking out leadership positions in emerging areas such as robotics. The United States is the largest tech market in the world, representing 32% of the total, or approximately \$1.7 trillion for 2014. In the Indian, as well as in many other countries, the tech sector accounts for a significant portion of economic activity. CompTIA's [Cyberstates](#) report reveals that the economic impact of the Indian tech sector, measured as a percentage of gross domestic product, exceeds that of most other industries, including notable sectors such as retail, construction, and transportation.

The bulk of technology spending stems from purchases made by corporate or government entities. A smaller portion comes from household spending, including home-based businesses. With the blurring of work and personal life, especially in the small business space, along with the shadow IT phenomenon, it can be difficult to precisely classify certain types of technology purchases as being solely business or solely consumer.

CompTIA projects the global information technology industry will grow at a rate of 3.7% in 2014. The optimistic upside forecast is in the 5.4% range, with a downside floor of 1.9%. Growth expectations for the Indian market are in line with the global projection. As the largest tech market in the world, Indian forecasts and global forecasts are inextricably linked. This is a narrower forecast range than what has been seen in past years, meaning industry executives are exercising a relatively high degree of caution in an unpredictable environment.

CompTIA uses a consensus forecasting approach. This “wisdom of the crowds” model attempts to balance the opinions of large IT firms with small IT firms, as well as optimistic opinions with pessimistic opinions. The results attempt a best-fit forecast that reflects the sentiment of industry executives.

As with any forecast, especially one as far-reaching as overall industry growth, many factors can play a role in the estimation. On the upside, spending on emerging tech may accelerate and even drive additional spending in well-established areas that act as foundational pieces. Conversely, currency fluctuations or trade policies could have a negative impact, causing companies to tighten their belt on discretionary IT purchases.

Other factors that influence revenue growth projections include pricing and product mix. The tech space is somewhat unique in that prices tend to fall over time, which may result in large numbers of units shipped but only modest revenue growth. As with last year, the product mix in the year ahead will be an especially important factor, as the high growth rates of emerging categories are expected to more than offset the slow growth mature categories.

Objective:

This paper intends to explore technology companies at the national stock exchange; remains backstage to fulfill the demand for capacity, reliability and performance ensuring the competitive edge of NSE as India's number one exchange platform.

Tech services and software account

The allocation of spending will vary from country to country based on a number of factors. In the mature Indian market, for example, there is robust infrastructure and platforms, a large installed base of users equipped with connected devices, and available bandwidth for these devices to communicate. This paves the way for investments in the software and services that sit on top of this foundation. Tech services and software account for nearly half of spending in the Indian technology market, significantly higher than the rate in many other global regions. Countries that are not quite as far along in these areas tend to allocate more spending to traditional hardware and telecom services. Building out infrastructure and developing a broad-based digital workforce does not happen overnight. Scenarios do exist, however, whereby those without legacy infrastructure – and the friction that often comes with transitioning from old to new – may find an easier path to jump directly to the latest generation of technologies.

While emerging technologies currently account for only 17% of the overall global revenue, they are expected to drive nearly half of the growth in new revenue. There are two caveats to this projection. First, the nature of emerging technology means that there is less history to guide future forecasts. Not only might the numbers be off, but it is also difficult to predict which categories will take off and which ones will fall by the wayside. Second, the stackable architecture of modern business systems blurs the lines between categories. While emerging technologies will be the driver for growth, they must be used in conjunction with more established technologies to create innovative solutions.

Role IT pros an opportunity to play

If the industry is strong and maturing, and if businesses are taking the next step in developing technology strategies, then it stands to reason that IT professionals should feel confident about their future prospects. Overall, this seems to be the case. The vast majority of technology workers feel optimistic about their role as an IT professional. In the Indian, 86% of IT pros rate their outlook as very good or fairly good. In different geographies, the sentiment is the same—81% in Canada, 75% in the UK, 82% in Australia/New Zealand (ANZ) and 85% in the Benelux region (Belgium/Netherlands/Luxembourg). The primary reason for the positive sentiment is high demand for technology skills, which in turn leads to robust career options. There is also a sense that the importance of technology to business objectives makes technology a more integral part of business operations and gives IT pros an opportunity to play a role in the direction of the organization.

On the other hand, some individuals have reservations about their career in the technology field. One of the main reasons for concern is the challenge of increasing complexity in business systems. The trend of skill diversity is not lost on technology professionals. The first step in handling complexity is to grow individual skills, but as things scale up, it becomes untenable for one person to handle it all. This can lead to a feeling of uncertainty and also a feeling that better results are expected even though budgets are flat or shrinking. Other factors contribute as well. In the Indian and Canada, there is slightly more worry over outsourcing. In the UK and ANZ, one of the main issues is an inability to pursue skill growth in the current role. And the Benelux region stands out in terms of fear over the perception that technology causes harm to society. To some degree, these issues are present for any field, and it is worth repeating that a minority of IT pros have any uneasiness at all. The remainder of this report will focus on analysis of the Indian market, and corresponding international data can be found in the supplemental material on CompTIA's website.

In-demand skills are a major driver for future sentiment, but the reason skills are in such high demand is that there is such a wide variety today. As the trends section described, the IT skills of the previous era were marked by a heavy concentration in infrastructure. Now, as companies are maturing in their technology usage, there are demands across all four IT pillars defined by CompTIA's IT framework. Software development is the area where most companies expect to place focus in the upcoming year, but there is also strong demand for cybersecurity, data, and infrastructure. Looking at each area individually highlights the layers of complexity that companies are dealing with as they try to build the best skills within their workforce. Starting with infrastructure, the topic attracting the most attention in the upcoming year is cloud computing. Cloud computing is certainly not a driver of headlines today—indeed, it does not receive top billing in any of CompTIA's 2014 trends—but it is still a driver of both IT tactics and IT strategy. As an established technology, companies are now in the next phase of cloud adoption, taking a holistic view of their IT architecture and reconfiguring workflow to take maximum advantage of cloud benefits. Other main concerns within the infrastructure category likewise have the feel of the tried and true. Networking is an area being constantly upgraded as data demands grow. Storage solutions need to match workflow demands, and solid backup plans are key for ongoing operations. Server administration is still a key role since very few companies are shifting to 100% cloud-based architecture. Only after these four areas are covered do companies begin thinking about an emerging topic with internet of things.

Attention to DevOps

While software development is poised to be the primary pillar for many firms in 2014, it is also an area where many firms may not have a long history. Until cloud computing lowered barriers for custom development, companies relied heavily on packaged software. In order to come up to speed, businesses are quickly learning both the best practices of the past and the new evolutions in the development space. User experience is a good example of the latter, as mobile apps have redefined expectations around usability and reliability. Artificial intelligence is another evolution, albeit one in much earlier stages. Quality assurance is perhaps a topic that bridges both sides—a practice that has always been a part of software engineering, but one that has changed drastically as cloud computing has given rise to microservice architecture. For all the attention that DevOps has received, it is somewhat surprising to see it so low on the list of critical areas. This could be due to the fact that data and security are nearly on equal footing with development and infrastructure, so a practice revolving around only two of the four pillars is not comprehensive enough.

Cybersecurity is possibly the most complex of the four pillars, covering expanded defenses that companies must build, innovative approaches to proactively test those defenses, and internal processes that create secure operations. Cybersecurity analytics is the most prominent field companies plan to focus on, since the collection and analysis of data can help cut through some of the complexity and allow smaller teams to manage larger implementations. Privacy and risk analysis are less about technology tools and more about corporate policies, forcing companies to establish guidelines that may have never before been in place. The use of cybersecurity metrics may also be a new concept for some businesses, and IT pros must choose the best metrics to match their firm's risk tolerance and business workflow. These areas are the most sought-after, but the reality is that all areas of cybersecurity are critical for building a robust security posture.

Finally, the field of data is not set up to be a dedicated function as often as cybersecurity, but it is still a field where businesses are trying to establish comprehensive policies and management. The leading two skills that companies are looking for demonstrate the typical balancing act between modern practices and established fundamentals. Predictive analytics has

become the specific goal emerging from the general field of big data. Not every company is prepared to manage massive amounts of data being consolidated from multiple streams, but every company can begin using their existing data to produce insights. For those firms that are coming up to speed on data practices, database administration is a starting point for a more formal approach. As far as cutting edge technologies, distributed ledgers such as blockchain have tremendous potential, but there are still hurdles in implementation and the technology will most likely remain a degree separated from most end users.

Technology foundational pillars

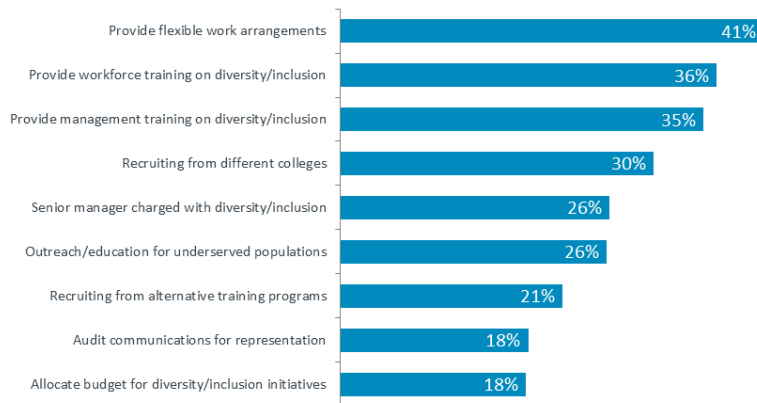
Adding to the challenge of filling a broad range of skills, companies are generally looking for candidates with deeper expertise. Across all four IT pillars, hiring companies are primarily targeting either early career (3-5 years of experience) or mid-level (6-10 years of experience). This may make sense in the areas of infrastructure and software development, where businesses have likely built a hierarchy of skills over time. For cybersecurity and data, the situation is more complicated. These areas, which have traditionally been subsets of infrastructure and development, have relied on those foundational pillars to provide the entry level skills. Now that they are distinct functions, there are difficulties in creating the pipeline for more advanced talent. Over time, entry level positions will likely emerge, but in the meantime companies will have to explore different avenues for filling their skill gaps.

Thanks to these pipeline challenges, hiring is lower on the priority list for companies in the upcoming year. Instead, there will be a strong focus on training and certifying the employees that are already on board. When it comes to career growth, there are three distinct areas IT pros expect to develop. First is technical skill within the existing specialization. With so many different topics within each pillar, there is plenty of room for growth. Second is technical skill in a new area. The four pillars interact in unique ways, and these overlaps define how business solutions are built and maintained. The final focus area for career growth is project management, going beyond the technical interactions to handle scheduling, deliverables, and tradeoffs.

Shifting gears from skill needs and development, the other workforce topic that will be a major issue in the upcoming year is diversity and inclusion. Although 30% of companies feel that there has been significant improvement in the diversity of the tech workforce over the past two years, previous CompTIA research has shown that sentiment tends to skew more positive than reality on this topic. A wide range of research and anecdotal examples proves that there is still much work to do in achieving equity, from data on wage gaps to the makeup of executive teams to ongoing reports of abusive behavior. The trend may be heading in the right direction, but the chasm was so wide that it will take significant time and intentional changes to close.

Four out of 10 companies say that fostering workforce diversity is a high priority for 2014. There is a long list of actions that could improve the situation. Flexible work arrangements, including the physical environment, can create more opportunities and a more welcoming atmosphere, especially if there is a hard look at how the existing arrangements unintentionally create barriers. Training remains a popular option, though it is imperative that the principles from training are also found in corporate culture. Some options that may deserve broader adoption are recruiting from training programs that focus on underserved populations (which also has the effect of improving the skill gap problem) and carefully reviewing corporate communications to ensure equal representation and inclusive language.

Many Options for Improving Diversity/Inclusion



Overall, the landscape for the IT profession in 2014 is one full of opportunity but also one that is rapidly changing. There is the potential to apply technical skills across the business for personal exposure and growth, and there are also unique questions that need to be answered around the role of technology in modern business and society. As existing skills and practices provide the foundation for digital transformation, technologists should also be open to new skills and practices that add value to their business and produce success in their career.

THE BUSINESS OF TECHNOLOGY CONTINUES TO EVOLVE

Rapid change is happening across the IT channel today, affecting business models, the competitive landscape, customer types, buying patterns, M&A activity and more. Technology and the business of selling it has grown far more complex. What was once a fairly stable set of infrastructure products in a channel provider's portfolio has, in the cloud age, morphed into myriad choices around software-as-a-service applications, data tools, and a stack of emerging technologies. It's a far cry from straight-up hardware device sales. As a result of this complexity, integration work and security considerations have ratcheted up, making the channel's job more and more challenging. But with challenges come opportunities. Looking ahead to 2014, firms that manage to thrive will be making investments in skills training, expanding their market reach to new customers and verticals, partnering with potential competitors, and embracing emerging tech. For many, that means getting out of their comfort zone.

Companies in the channel are pretty clear about what they believe will contribute to positive outcomes next year. It's about the customer. Six in 10 channel firms said the No. 1 factor that will ensure robust growth for them will be their ability to reach new customer segments. This likely means both expanding into new vertical markets or simply growing the aggregate number of customers across the business. The No. 2 catalyst for a positive year includes picking up additional business from existing clients. This is especially true with managed services providers for whom upselling current customers to additional types or tiers of services is often the key to growing revenue and profit margin. Other areas where firms place value include expanding their business lines, which explains the enthusiasm seen for adding emerging technologies to their portfolios. From a practical perspective, companies also see potential benefit from tightening up their operations internally. Efficiency and cost-cutting, while not the most exciting, are a necessary measure to investing in new market expansion and new customer acquisition.

Conclusion

Of all the emerging tech categories – and they are myriad – IoT hardware and software ranked as the biggest revenue drivers, not surprising given their relative maturity compared to newer emerging tech categories such as drones, for example. 5G, AI, and VR may not have the current revenue stream, but channel firms are excited about the future potential of these fields. Items such as quantum computing or robotic process automation, while on the radar of a good portion of channel firms, are most likely not going to play a huge role in an organization's revenue generation next year or beyond, other than for those in niche markets.

There are inhibitors to emerging tech adoption in the channel, and they make perfect sense given the general size and scope of most of these organizations. Budget constraints tie many a company's hands even if they want to dive into a new solution category. Risk aversion is also real, while others struggle with determining a clear business need to adopt some of these new categories. One reason to throttle back on adoption exuberance? Customers. A quarter of channel firms say their customers are actually overwhelmed by the array of choices and the media bombardment about new, shiny stuff. As a result, they have decided to take it slow and focus more on the basics of their tech needs, such as security and infrastructure.

Increasing technology complexity has real-world implications for business models, that's clear. But increasing technology ubiquity cannot be ignored. The democratization of technology across all levels of the business world is impacting how the channel sells and goes to market, to whom they sell, what the sales cycle looks like, and the type of services that wrap around any initial sale or engagement. More than half of channel professionals today (55%) say that IT budget ownership, at least in part, has shifted from solely the IT department to line of business groups, from the CFO's office to human resources to marketing.

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