



The SMAC Code

Embracing new technologies for future business

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Foreword

As we enter a new digital age, coded information surrounding people and companies aligned with the internet of things will reshape how we live and work. The growth of information is already seeing value chains undergo transformation from widgets to digits. SMAC will be the platform that will enable organisations to drive consumerization of technology, including Enterprise IT. Early adopters of SMAC stack would have a clear competitive edge in their line of business. It will become the new basis of competition, helping organizations build new business and operating models.

R Chandrasekaran

Group Chief Executive, Cognizant Technology Solutions The business landscape is changing; we are entering what many call the 'post-digital era', where the confluence of emerging technologies is leading to new possibilities for consumers, enterprises and technology vendors. Multiple technology trends, including social media, mobility, analytics and cloud computing are fusing relationships between customers boosting agility within the enterprise and in the market, and leading to increased collaboration among internal and external stakeholders.

The 'post-digital customer' is leading to seismic changes in buying behavior – a trend that is leading to ripple effects across the business-technology ecosystem. Businesses have to adapt to an era in which customers possess a wealth of information – from multiple digital sources – that enable them to take informed buying decisions. The emergence of social media, increasingly accessible through smartphones and tablets, has made information from all across the world accessible at the touch of a button.

Two more technology enablers – analytics and cloud computing – will play a critical role in allowing businesses to tap into their customers and understand their buying behavior. Businesses can then change their products, delivery channels, marketing etc and be successful in winning over customers. The confluence of all these four enablers – social media, mobility, analytics and cloud computing – collectively referred to as SMAC will be the leading business-technology enabler of the next decade.

For technology vendors, SMAC means that traditional models – operating, delivery or pricing – will no longer work. Vendors will have to adapt to the SMAC era by becoming more innovative and entrepreneurial, breaking down organisational silos and adopting next-generation hub-andspoke delivery models, and finally outcome-based pricing models.

This paper explores the potential opportunity from SMAC and suggests ways in which the IT providers and the user community can better capitalize on this opportunity. We hope you find this interesting and useful; we welcome your comments and feedback on this report.



R Chandrasekaran Chairman, CII Connect 2013 & Group Chief Executive Cognizant Technology Solutions



Pradeep Udhas Head - Sales & Markets KPMG in India

Executive summary

The increasing pace of change is rapidly driving customer, businesses and technology firms in a tight embrace, with the convergence of disruptive technologies eroding the boundaries separating them. Businesses are becoming more and more agile, and technologies such as social media, mobility, analytics and cloud computing are coming together to unleash unlimited opportunities for everyone involved. This convergence – also known as SMAC – will be the leading disruptor to the business-technology ecosystem over the next few years.

Social media



A social media strategy has become a must for all enterprises, be it banks, retailers or the government. With over one billion individuals logged on to various social networks, people are now using social media for advice on what products to buy, where to shop and even regarding what firms they want to work with. While most enterprises use social media for their customer service function only, many firms have now started using social media in tandem with their sales and marketing functions. This in turn enables firms to use data generated by the customers effectively to service their larger pools of customers.

Mobility

Mobile devices have changed the way people access digital content. Smartphones and tablets have brought rich, digital content to the fingertips of consumers. Mobile banking has emerged as one of the most innovative products in the financial services industry. Shoppers are increasingly using their mobile devices for everything from browsing to comparing to buying products. Governments are also reaching out to their citizens, using mobile devices as an efficient channel. Enterprises must also jump on to the mobility bandwagon, and ensure that their applications are mobile ready.

Analytics

Every year, companies and individuals generate billions of gigabytes of data. Data, which properly analyzed and used in time, can emerge as an unbeatable competitive advantage. Enterprises need to recognize the prospect analytics represents and should adapt their IT strategy to capture such opportunities'. Analytics can help retailers predict buying decisions of shoppers; it can help banks weed out fraudulent transactions; while governments can use analytics to provide services directly to their citizens. Predictive analytics has also been adopted across industries in various scenario building activities.



Cloud computing

The undeniable power of cloud computing to foster innovations and improve productivity is now accepted by both IT vendors and their customers. While the financial services and government sectors are mostly moving to a private cloud model due to information security concerns, other industries like healthcare and retail have adopted public cloud. Moreover, their existing infrastructure has helped telecom players to emerge as providers of cloud computing, leading to erosion in boundaries between IT and telecom vendors.

Technology vendors will need to change the way they are structured to deal with SMAC. They need to be nimble, and think on their feet. Rather than being bureaucratic organizations, technology vendors will need to create an entrepreneurial culture, along with next-generation delivery and pricing models that will work in realizing the maximum potential from SMAC. They will also need to look at an inorganic strategy to add to their capabilities in some of these areas. This will also have the added advantage of brining in talent that will act as a force of disruption in these organizations.

Going forward, technology vendors should seek to work closely with their customers to stay abreast of the latest technological developments, and come up with solutions that can take advantage of SMAC. They should seek to use customer input more diligently while innovating / developing solutions and products. The emphasis should be on tapping inputs from various channels, mediums and devices and using these as critical inputs for new solutions and incremental innovations. Industry bodies can also play a vital role in this, and increase awareness about these technological trends.



Understanding the enterprise of tomorrow

What will the enterprise of the future look like

Modern corporations have become an ubiquitous institution in today's world, with millions of adults working for one. Whenever we head to the supermarket or the shopping mall, whenever we travel by car or plane or train, whenever we invest for retirement or go to the movies, we operate in markets dominated by big business. Through expenditures on research and development, enterprises have generated new technologies and new products, which in turn often trigger far-reaching social and cultural transformations. There is simply no way to make sense of the last 150 years of world history without a solid understanding of the enterprise¹.

Enterprises have undergone revolutionary changes in the way they operate over the past few decades. Today's enterprises bear little resemblance to their counterparts from the 20th century, both in the way they operate, as well as the customers they serve. Technological changes, as well as changes in the marketplace have been the primary drivers for the changing enterprise².

The advent of the digital age over the past two decades has accelerated the velocity of change in enterprises across the world. The evolutionary process of change has been transformed into a revolutionary change process. Enterprises, as well as their customers and suppliers have been impacted to varying degrees in the digital age³.

While an individual might think of the present as the zenith of the digital age, experts believe the best is yet to come⁴. The disruptive technologies of today – Social media, mobility, analytics and cloud computing³ – will act as enablers to the next generation of technological trends, which will surpass today's technology in scale, complexity and impact on the world around us.

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¹ The Modern Corporation: Origins, Evolution, Attributes; Oliver E. Williamson, Journal of Economic Literature, Vol. 19, No. 4 (Dec., 1981), pp. 1537-1568 2 The Man Who Invented Management, BusinessWeek, November 27, 2005; http://www.businessweek.com/stories/2005-11-27/the-man-who-invented-management,

accessed August 18, 2013

³ KPMG in India analysis

^{4 &}quot;A "Post Digital" World, Really?", Google Insights, http://www.google.com/think/articles/a-post-digital-world-really.html, accessed August 19, 2013

	Pre-digital era	Digital era	Post-digital era
Organization structure	Highly centralized	Semi-decentralized	Highly decentralized
Decision making process	Management driven	Management driven, with customer input	In collaboration with the customer
Customers	Lack information	More informed	Highly informed
Role of technology	Support function	Strategic function	Business enabler
Disruptive technologies	PC's	Internet, mobility, social media	Artificial intelligence, Robotics, Augmented reality, cloud computing, BYOD

Analysis of pre-digital, digital and post-digital era's, KPMG in india analysis

Pre-digital era

The pre-digital era, the decades before the 1980s, was the proverbial technological dark ages for enterprises. Analogue devices dominated the mainstream, which made it very difficult to utilize information. Moreover, in the absence of information from customers, the decision-making process was highly centralized. Innovation too became a top-down process, driven by what the top management believed was needed in the marketplace. Information technology (IT) was mainly seen as a support function, housed in small, internal teams within most enterprises. Along with Finance and HR, IT was seen through the prism of being a provider of support services to the core functions of the business. The lack of third-party providers of IT services added to the conundrum, as internal IT teams lacked knowledge and access to the latest technological trends. Also, computing power was scarce and costly, and was limited to large corporations, government departments and universities only⁵.

Technology and innovation in the pre-digital era



Source: KPMG in india analysis

5 Digital Era Governance: IT Corporations, the State, and e-Government, Patrick Dunleavy, Helen Margetts, Simon Bastow, Jane Tinkler

Digital era

The 1980s and the 1990s saw the dawn of the information age and with it the digital era. Mass digitization – the availability of affordable computers, as well as software – allowed enterprises and individuals to utilize technology in a wide variety of areas. According to Nicholas Negroponte, "a transformation was occurring away from an "atombased" economy, and towards one focused around the creation, manipulation, communication and storage of electronic binary digits."⁶

In the mid-1990s, millions of individuals and organizations were also joining research scientists and gaming enthusiasts as new citizens of the Internet. Meanwhile, analogue media - such as vinyl records and cassette tapes - were also increasingly being replaced with digital substitutes, such as compact discs. The spread of the internet was instrumental in breaking down geographical boundaries, and making the world "flat" It enabled enterprises to work seamlessly across political boundaries, and enabled management to keep tabs on operations in far-flung areas⁷. The ubiquitous spread of digital devices led to the availability of information in digital information – information on customers, suppliers and competitors – that could be readily analyzed. Moreover, IT began to be seen as a strategic, rather than a support function. This also led to rise of numerous IT service providers, which allowed enterprises to outsource their IT needs to these external service providers. The late 1990s also saw the rise of off-shoring, with nations like India emerging as locations for executing IT-BPO services. At the same time, the spread of mobile devices led to a communications revolution, which allowed millions of individuals at the "bottom of the pyramid" to participate in the digital revolution⁸.

The first decade of the new millennium gave further impetus to this digital revolution, and the proliferation of high-speed internet, smart phones and tablets led to the rise of the 'digital consumer'.⁹

Technology and innovation in the digital era



Source: KPMG in india analysis

Technology and innovation in the pre-digital era; KPMG in india analysis

⁶ http://archives.obs-us.com/obs/english/books/nn/ch01c01.htm, accessed August 20, 2013

⁷ http://www.explainingthefuture.com/sdr.html, accessed August 20, 2013

⁸ Thomas L. Friedman Lectures on the World is Flat 3.0, Centre of International and Regional Studies, Georgetown University, http://cirs.georgetown.edu/105263.html, accessed August 21, 2013

⁹ Six converging technology trends, KPMG 2013, http://www.kpmg.com/IN/en/IssuesAndInsights/ArticlesPublications/ Documents/Six-Converging-tech-trends.pdf, accessed August 21, 2013

The Home Depot was an early innovator in the mobile space and saw the need to capitalize on the fast-growing mobile market opportunity. Their first mobile site was launched in May 2010 and has continually improved over the last two years.

To stay ahead of the curve, the company launched a significant mobile redesign, adding user localization which allows users to access real-time inventory, pricing and aisle location for any given store, and more. The Home Depot's cost per macro-conversion has decreased by 75 percent since the mobile site launched, and between 2011 and 2012, visits originating from a mobile device tripled. ("Home Depot Bridges the Gap between In-Store and Mobile Experience",

Google Insights, http://www.google.com/think/ case-studies/home-depot-360-mobile-strategy. html, accessed August 22, 2013)

Post-digital era

With over 4.5 billion mobile subscribers and over 2.5 billion internet users¹⁰, many believe that we have already entered the post-digital era. Multiple technology trends, including social media, mobility, analytics and cloud computing are fusing relationships between customers boosting agility within the enterprise and in the market, and leading to increased collaboration among internal and external stakeholders¹¹. The rising presence and reach of the internet, coupled with the prolific growth of smartphones, tablets and related technologies, has provided consumers with unmatched access to information on the go, thereby helping them make informed purchasing decisions.

The adoption of digital media is redefining consumer mindsets, patterns of purchase and decision making. This, in turn, is transforming consumer behavior¹². The rapid pace at which digital media is being adopted is also expected to propel growth in the use of consumer technology.

Delivering the digital experience of the post-digital future will call for new skills, technological capabilities such as cloud, analytics and mobility backed by new organizational approaches. This era will also lead to a shift in decision making from the CIO to the business heads, especially CMO, considering that marketing function is one of the largest spenders on IT. The changing demand of the consumers and the attempt of industries in satisfying the same will also lead to increased pressure on IT vendors. Platforms and solution offerings will need to evolve not just from a technology standpoint but also from an offering and outreach perspective¹².

Enterprises across the world are moving to an 'extremely revenue focused' model; they want to have a sustainable competitive advantage, provide a superior customer experience and be cost conscious at the same time. To achieve all this, they have to transform themselves to become very 'agile' (very dynamic to change, faster to bring out their products), 'context aware' (about their industry and customers with customer insights and competition analysis), 'connected' (with customers, trading partners, suppliers) and more importantly 'insight enabled' (from internal and external data from social media and other data sources). To transform these enterprises towards these four necessities, SMAC is an inevitable natural force that has to be embraced quickly.

Technology and innovation in the post digital era



Source: KPMG in india analysis

11 KPMG in India analysis

¹⁰ Ericsson mobility report 2013, pg 14, http://www.ericsson.com/res/docs/2013/ericsson-mobility-report-june-2013.pdf, accessed August 22, 2013

¹² Six converging technology trends, KPMG 2013, http://www.kpmg.com/IN/en/IssuesAndInsights/ArticlesPublications/Documents/Six-Converging-tech-trends.pdf, accessed August 21, 2013

The changing enterprise

Enterprises in the post-digital era have been forced to adapt to the changing marketplace, with 'digital consumers' riding the wave of social media and mobility to emerge as more informed decision makers. The key technology trends – social media, mobility, analytics and cloud – collectively known as SMAC, have been behind this transformation¹³.

Leading enterprises are creating digital strategies for their brands; however, many are unsuccessful in producing the expected business outcomes and value through such initiatives, as these technologies are being perceived in silos¹⁴. A holistic and integrated strategy including consumers, the enterprise ecosystem and channels is the need of the hour to cater to evolving demands and behavior. The effective use of such channels can help increase sales by monetizing demand, improve the effectiveness of marketing campaigns, enhance product development, drive multi-channel commerce and, above all, strengthen consumer engagement¹⁵.

The Large Hadron Collider (LHC), which aims to answer fundamental questions of the universe's existence, is one of CERN's most important projects. But as the LHC produces 1PB of data every second, big data and lack of computing resources were becoming the European Organization for Nuclear Research's (CERN) biggest IT challenges.

The IT team at CERN utilized the limitless computing power of the cloud to address its problems. It used an Openstack based private cloud platform to analyze the data generated by the LHC, and help scientists gain insights into the origins of the universe("Case study: CERN adopts OpenStack private cloud to solve big data challenges", Computerweekly.com, http://www.computerweekly.com/ news/2240173897/CERN-adopts-OpenStack-private-cloud-to-solve-big-data-challenges, accessed August 22, 2013)

Adidas, a leader in the sporting goods industry implemented a cutting-edge mobile campaign that helps provide a complete scope for how mobile advertising assists in brick and mortar sales. Potential customers often interact with a retailer's mobile website to locate a nearby store. Knowing this, Adidas created an online-to-offline mobile campaign. By leveraging location extensions in the search ads, users were directed to the store locator page which helped drive in-store traffic.

Adidas recognized that in order to build an effective mobile presence, it had to pivot customers thinking to understand how mobile drives value beyond mobile commerce, particularly in-store sales. This enabled Adidas to prove that mobile created a 680 percent incremental increase in ROI. ("Understanding the Full Value of Mobile: adidas Drives In-Store Traffic with Mobile", Google Insights, http://www.google.com/ think/case-studies/adidas-and-iprospect-explore-instore-conversions.html, accessed August 22, 2013)

14 "From digital strategy to brand mastery", Interbrand, http://www.interbrand.com/ libraries/articles/digital_whitepaper_nov_final_final.sflb.ashx, August 22, 2013



¹³ KPMG in India analysis

^{15 &}quot;Connecting Digital Strategy with Social Business and Next-Gen Mobility", http:// dachisgroup.com/2011/07/connecting-digital-strategy-with-social-business-andnext-gen-mobility, accessed August 23, 2013

Decoding SMAC: what does it mean?

The digital shift

Influence of digital channels across all stages of purchasing









Feedback



Seek Information Evaluation

Purchase







Of web traffic comes via mobile – more than double last year



Of global population which is online



Growth in the number of global 3G subscribers in the past year



Estimated number of business transactions on the internet, B2C and B2B, per day by 2020



Smartphones and tablets will be installed globally by mid 2013 - overtaking laptops and PCs



Amount of data in the world by 2020

Increasing influence of digital channels



businesses plan to increase their digital marketing budgets in 2013

- The social commerce market is forecast to reach USD 30 billion by 2015
- Leading global retailers are spending between 20-25 percent of their advertising budget on social media channels
- Mobile technologies can be used to cut the cost of a financial transaction by up to 80 percent
- Nearly 90 percent of top global banks use social networking to achieve customer engagement





2012

2016

66

The four pillars of SMAC

The emergence of new technologies over the past few years has resulted in a transformational change in the world around us. From the rise of social media with it's over 1 billion subscribers worldwide, to the ubiquitous spread of mobile phones and the resulting explosion of big data and big analytics, the world around us is changing faster than any one of us could ever imagine. Add to this the ever expanding presence of cloud computing in our life, and we're probably witnessing the zenith of the technological age⁹.

KPMG in India believes that four key technologies will hold the key to success for enterprises across the world. These include:

Social Media	Mobility	Analytics	Cloud
 Over 1 billion social media subscribers globally Already disrupting traditional models of marketing and selling Facebook, Twitter and Linkedin among the most popular social media firms 	 Industry is shifting from the PC/laptop to mobile devices 4.5 billion mobile subscribers globally; nearly 900 million in India alone The spread of affordable 3G and 4G networks driving the growth of mobile apps 	 Every year, companies and individuals generate billions of gigabytes of data Companies which analyze and glean insights from this data can emerge as leaders Holds tremendous potential across industries like financial services, retail and pharma 	 Has the potential to foster innovations and improve productivity across industries Everything from enteprise applications to our music is now using the cloud Can emerge as a tool for making computing more affordable in the developing world

Table 2 SMAC statistics, "state of the media: the social media report 2012"; "Ericsson mobility report 2013"; KPMG in India analysis

Our Design Philosophy is MUSIC - Mobility, User Interface, Social, In Memory and Context Aware. From MUSIC, it's now MUSICAL where Analytics and Location Aware have become a significant part of all our offerings.

Our product strategy is aimed at making the user experience simple and designing the product first for the mobile, and then for tablets and desktops. Hence following the thumb rule - Mobile First, Rest Later.

> Srinivasan R Chief Technology Officer, Ramco Systems

Mobility

Mobile devices have changed the way people access digital content. Smartphones and tablets have brought rich, digital content to the fingertips of consumers. Shoppers are increasingly using their mobile devices for everything from browsing to comparing to buying products. Governments are also reaching out to their citizens, using mobile devices as an efficient channel. Enterprises must also jump on to the mobility bandwagon, and ensure that their applications are mobile ready.

Global mobile subscriptions reached 6.4 billion during Q1 2013, with 4.5 billion individual subscribers¹⁰.





Source: KPMG in India analysis

Key trends in mobility

Spread of BYOD: As more and more smartphones, tablets and other devices find their way into the hands of employees, the demand to use them at work will intensify. This trend will only accelerate in the years to come, and more and more enterprises are adopting a formal 'Bring Your Own Device' (BYOD) policy .

Employees are engaging in multiple work-related activities using their mobile devices; the three key activities include:

- a. Reading or viewing documents, spreadsheets, or presentations
- b. Tablets are often used for analytics and modeling as well as to access web meetings and videoconferences

c. Accessing email, calendar, and intranet or employee portal sites lead the way for both devices

The concept of BYOD is playing an important role in enhancing productivity, agility, employee satisfaction and retention in the enterprise. With the proliferation of employee owned devices, ubiquitous information access and the growing influence of CXOs in technology decisions, CIOs need to strike a balance between user expectations and enterprise requirements and institutionalize governance to secure business information while enhancing efficiencies



Mobile priorities by role, citrix enterprise mobility report

Rise of mobile apps: The spread of smartphones has led to growth in the ecosystem of mobile applications. Ranging from simple apps dealing with mail, calendar, stock prices and weather to complex enterprise mobile apps, which enable users to access SCM, CRM and other analysis tools, mobile apps, have successfully caught the imagination of consumer as well as business users. The number of mobile app downloads are expected to touch 183 billion annually by 2015, from just 10 billion in 2010¹⁴.

Mobile apps will help in automating workflows, streamlining content discovery and build knowledge iteratively over time as employees and customers use an application. Spending on mobile enterprise business apps will more than double from USD 26 billion in 2012 to USD 53 billion in 2017¹⁵.

But this rapid growth has brought about its own set of challenges; firms are overwhelmed by choices of device type, operating system, operating system version; and application type.

M2M becomes ubiquitous: From smart homes to connected cars to intelligent medical devices, a wide universe of products will embrace mobility as a 'must-have.' M2M value chains are emerging across industries, and telecom operators are engaged in a fierce fight with other enterprises for a share of M2M revenue. IT vendors are also coming up with integrated solutions that tie M2M technologies with cloud and analytics.

Global cellular M2M network connections



Challenges in spread of mobility

KPMG in India has identified three key challenges holding back the spread of mobility3:

Device fragmentation: For enterprises to truly support the mobile platform, they need to support multiple operating systems and device formats. With increasing budgetary pressure, it becomes a challenge to accommodate multiple formats. Moreover, the technical complexity of supporting multiple formats is an immense challenge in itself.

Data security: Even with the increasing adoption of BYOD, data security and privacy remains a challenge. According to a recent survey, 45 percent of American workers are worried about IT accessing personal data on devices they use for work and home¹⁶. Bringing different models and types of devices lead to compatibility issues. The use of personal mobile devices also leads to data ownership issues.

Cost: There is a vast legacy of enterprise applications developed for the PC, with a large pool of employees trained on these applications. Developing these applications for myriad mobile platforms is a costly affair; however, prioritizing one platform over another can lead to a large segment of the mobile subscriber base being ignored.

Mobility scenario in India

India has emerged as the second largest mobile market globally, behind only China. With over 870 million mobile subscribers , businesses are jumping on to the mobile opportunity. Moreover, the nation has also emerged as the third-largest smartphone market (by shipments) . Both consumers and business buyers in India continue to harbor an aggressive appetite for mobile devices, adding to the already large collection of devices that are still in active use. Rising focus on the mobile web platform is affecting a number of business aspects, including ecommerce spending and online advertising.

Mobile devices can also play a vital role in increasing financial inclusion in the country, as well as the spread of education in rural areas (using tablet-based courseware).

Orlando Health is transforming patient care by allowing a neurologist to remotely examine a patient from any location using a tablet that can control a camera at the patient's bedside.

> Mobility shall be the game changer for banks in the near future. With smart-phone penetration likely to be much higher than laptop and desktop penetration; banks will need to adopt this channel to cater to customer behavior and expectations. While in the past, IT vendors have provided for core banking platforms and solutions to service the sector at large, the need of the hour is solutions that can be delivered at the speed at which new devices and operating systems are launched in the market. Mobile based solutions also have a large element of design which distinguishes them from net banking.

> > Anil Jaggia CIO, HDFC Bank

¹⁴ http://www.businesswire.com/news/home/20110628005647/en/IDC-Forecasts-183-Billion-Annual-Mobile-App

 $^{15\} http://www.information-age.com/technology/applications-and-development/2143973/mobile-business-apps-market-to-reach-\$53bn-in-2017$

^{16 &}quot;Global Study Reveals Workers Do Not Trust Employers with Their Personal Data", Aruba Networks, http://www.arubanetworks.com/news-releases/global-study-revealsworkers-do-not-trust-employers-with-their-personal-data/, accessed August 24, 2013

Analytics

Companies have always kept large amounts of information. While it's true that the amount of data in the world keeps growing, the real change has been in the ways that we access that data and use it to create value. Today, you have technologies like Hadoop, for example, that make it functionally practical to access a tremendous amount of data, and then extract value from it. The availability of lower-cost hardware makes it easier and more feasible to retrieve and process information, quickly and at lower costs than ever before¹⁷.

It is the convergence of several trends—more data and less expensive, faster hardware—that's driving this transformation. The concept of analytics has been around for decades for firms that have been handling tons of transactional data over the years—even dating back to the mainframe era. The world is moving from 'Traditional analytics' to 'Predictive analytics' and now increasingly towards 'Prescriptive analytics' (where the decisions are driven by predictive models using business rules engines to help the companies to decide the "next best action"). The recent spurt in demand for analytics (as well as big data) can be attributed to two main factors³:

Convergence of computing technologies:

Analytics is the natural result of four major global trends: Moore's Law (which basically says that technology always gets cheaper), mobile computing (that smart phone or tablet in your hand), social networking (Facebook), and cloud computing. Moreover, traditional data management and analytics software and hardware technologies, open-source technology, and commodity hardware are merging to create new alternatives for IT and business executives to address this next generation of analytics .

Exponential increase in data: Large volumes of transactional data have been around for decades for most big firms, but the flood gates have now opened with more volume, and the velocity and variety— the three Vs—of data that has arrived in unprecedented ways¹⁸.

Characteristic	Description	Attribute	Driver
Volume	The sheer amount of data generated or data intensity that must be ingested, analyzed, and managed to make decisions based on complete data analysis	The world is generating 1.8 Zettabytes of information - with continuing exponential growth – projecting to 35 Zettabytes in 2020	Increase in data sources, higher resolution sensors
Velocity	How fast data is being produced and changed and the speed with which data must be received, understood, and processed	Accessibility: Information when, where, and how the user wants it Applicable: Relevant, valuable information for an enterprise Time value: Real-time analysis yields improved data driven decisions	Increase in data sources Improved connectivity Enhanced computing power of data generating devices
Variety	The rise of information coming from new sources both inside and outside the walls of the enterprise creates integration, management, governance, and architectural pressures on IT	Structured – 15% of data today is structured, row, columns Unstructured – 85% is unstructured or human generated information Semistructured –The combination of structured and unstructured data is becoming paramount	Mobile, social media, videos, chat, genomics, sensors

The three V's of analytics¹⁸

^{17 &}quot;Putting big data and analytics to work", McKinsey, http://www.mckinsey.com/insights/marketing_sales/putting_big_data_and_advanced_ analytics_to_work, accessed August 24, 2013

^{18 &}quot;Big Data, Big Analytics", pg 10-14, Michael Minelli, Michele Chambers and Ambiga Dhiraj

A wide variety of data sources are contributing to the analytics revolution:

- Internet data (i.e., social media, social networking links)
- Primary research (i.e., surveys, experiments, observations)
- Secondary research (i.e., industry reports, consumer data, business data)
- Location data (i.e., mobile device data, geospatial data)
- Image data (i.e., video, satellite image, surveillance)
- Supply chain data (i.e., vendor catalogs and pricing, quality information)
- Device data (i.e., sensors, RF devices, telemetry)

Enterprises are employing analytics in a wide variety of uses. The key ones include¹⁸:

	Improve operational efficiencies	Increase revenues	Achieve competitive differentiation
Mature analytic applications	Supply chain optimization Marketing campaign optimization	Algorithmic training	In-house custom analytic applications
Maturing analytic applications	Portfolio optimization Risk management	Ad targeting optimization Yield optimization	In-house custom analytic applications
Emerging analytics applications	Disease prediction and prevention	Customer churn prevention	Product design optimization Branding Product Market Targeting

Uses of analytics

We are witnessing the use of analytics in multiple industries. Companies are using analytics for everything from driving growth to reducing cost improving operational excellence to recruiting better people to completely transforming their business strategy. More recently, national and local governments across the world have started using analytics for optimizing public welfare programs, reducing traffic congestion in their cities and fighting crime.

Use of Analytics	Banking \$ Fraud detection Cross-selling products Customer retention	Healthcare Smarter EHR's Preventive healthcare Drug discovery	Retail Inventory management Promotional analysis Store operations	Transportation Traffic management Smarter roads Intelligent cars	Government Program management Crime prevention Citizen services
Examples	In Singapore, Citigroup keeps an eye on customers' credit card transactions for opportunities to recommend them discounts in restaurants. If a customer who has signed up for this service swipes a credit card, the system can look at the time of day, the location and the customer's previous habits and give recommendations Santander Bank in Spain uses analytics to send out weekly lists of customers who it thinks may be attracted to particular offers from the bank, such as insurance, to its branches	Martin's Point Health Care, a US-based healthcare provider, established a business intelligence competency center (BICC) to significantly reduce reporting demands and improve the productivity of its data users Eli Lilly's Phenotypic Drug Discovery Initiative enables external researchers to submit their compounds for screening using Lilly's proprietary tools and data to identify whether the compound is a potential drug candidate	Tesco applies sophisticated analytics tools to its supply chain data to cut waste, optimize promotions and stock fluctuations in demand. This has helped Tesco save GBP100 million in annual supply chain costs Wal-Mart Labs acquired the predictive analytics firm Inkiru in June 2013 bolster its ability to create better customer experiences through data. The key focus areas include site personalization, search, fraud prevention and marketing	The city of Cologne implemented an analytics solution to anticipate, better manage, and in many cases, avoid traffic jams and trouble spots across the city. The city's traffic engineers were able to predict traffic volume and flow with over 90 percent accuracy up to 30 minutes in advance. As a result, travellers would be able to better plan ahead and determine whether they should leave at a different time, plan an alternate route or use a different mode of transportation.	The Memphis Police Department's (MPD) predictive enforcement tool gives precinct commanders the ability to change their tactics and redirect their patrol resources in a way that both thwarts crimes before they happen and catches more criminals in the act. Through such smart policing approaches, MPD has reduced the overall crime volume in Memphis by 30%

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Big Data and analytics in the Indian sub-continent is at a nascent stage, however, the sectors like financial services and telecom have started to adopt these technologies. Also, other sectors including ecommerce are also among the early adopters of the technology to solve the issues of storing as well as creating business advantage from the everlasting data records.



With organizations generating multitude of data from every possible sources, it is paramount to identify which data will be more useful than others. Moreover, some of the data might not even be present inside the traditional boundaries of an organization, and might be available with its customers and suppliers. Organizations need to sift through the gigabytes of data generated every day, and identify the streams of data that can make a difference.

Analytics scenario in India

The usage of analytics is still at nascent stage as far as Indian businesses are concerned. While some industries like banking and telecom have started adopting analytics to get ahead of the competition, several factors have inhibited its growth. India's largest telecom operator, Bharti Airtel has been one of the foremost adopters of analytics, analyzing usage and charging patterns with the help of predictive analytics. Airtel works extensively with IBM for its analytics requirements. Its latest campaign, 'My Airtel My Offer', is based on customer analytics - every day, the company comes up with a customized plan for its customers based on their usage. It has been most effective with users who hold dual SIM cards and who decide to go with Bharti based on the offer they get on a given day²¹.

^{21 &#}x27;Analyse this', Outlook Business, Kripa Mahalingam, May 26, 2012 issue; http://business.outlookindia.com/ article_v3.aspx?artid=280977

Cloud computing

Cloud – buzzword in the today's evolving technology world is increasingly gaining traction among enterprises for its known benefits – cost effectiveness, agility, and less capital intensive. With these benefits cloud computing has not been restricted for the use of enterprises, its reach has extended with consumerization with the launch of various applications from a host of IT service providers.

Cloud computing history trail from the era of mainframe computing, however, the latest form of the technology what we see today, started to emerge with the proliferation of Internet. In 1999, the arrival of Salesforce.com was one of the key milestones in the cloud computing history, which pioneered the concept of delivering enterprise applications via a simple website. The in 2002, Amazon Web Services launched a suite of cloudbased services including storage, computation, and human intelligence. Since then the space has seen a significant increase in the number of cloud service providers with a host of solutions for different layers of the information technology ecosystem.

Cloud computing services are provided through public cloud, private cloud, and hybrid cloud environments wherein public cloud services have a larger pie of the total market owing to their easy availability, accessibility, and low cost of adoption. Per Gartner, the public cloud services market is expected to grow 18.5 percent in 2013 to a reach USD 131.0 billion from USD 111.0 billion in 2012. The growth is driven by the emerging segment of Infrastructure-as-a-Service (laaS), which includes cloud compute, storage and print services. laaS segment is expected to grow 47.3 percent in 2013 to reach USD 9.0 billion.²²



While laaS is one of the most fastest growing segments, cloud advertising is the most dominating, which held a share of 48.0 percent in 2012 followed by cloud business process services segment (BPaaS) with a 28 percent share, software as a service (SaaS) at 14.7 percent, cloud system infrastructure services (laaS) at 5.5 percent, cloud management and security services at 2.8 percent, and cloud Platform-as-a-Service (PaaS) at one percent.²³

In terms of geographic distribution North America is the dominating region with a share of 59 percent, however, the emerging geographies are India, Indonesia, Greater China and Latin America led by Argentina, Mexico and Brazil.

²² Newsroom, Gartner Website, http://www.gartner.com/newsroom/id/2352816, accessed on 2 September 2013

²³ Newsroom, Gartner Website, http://www.gartner.com/newsroom/id/2352816, accessed on 3 September 2013

Cloud computing scenario in India

The public cloud computing in India is forecasted to grow 36 percent in 2013 to total US\$443 million, up from US\$326 million in 2012. On the contrary to global market, SaaS is the leading segment in India with a share of 36 percent in 2012, followed by the cloud business process services segment (BPaaS) which is the second-largest market

India public cloud services market, by segments (2012)

segment after SaaS, comprising 23 per cent of the total market in 2012 in India.²⁴

Globally, dominating cloud advertising market is less prevalent in the country had a 12 percent share in 2012 in the Indian public cloud services market.



Source: Gartner

Although, India cloud market seems so promising from demand perspective, it lags in the infrastructure capacity for the cloud service providers. Amazon, the big daddy of cloud computing also serves its base of about 8,000 customers through data centers based out of Singapore. The reason for not having data centers located in India is owing to state of infrastructure and data security laws in the country. The absence of data security laws is further leading to loss of opportunity for the IT service providers of serving the global consumers by setting the data centers in the country.

Unites States continues to top the ranking table as the location with lowest risk followed by UK

In Asia, Hong Kong (#7) and South Korea (#13) lead the rankings Moreover, cloud is considered to be the next generation solution and would be key in offering the information technology services over Internet. Looking at India's strategic position of being an outsourcing hub for the world of technology services, it has the potential to become a hub for the global cloud where digital information is stored, processed and accessed via the internet that can be only feasible with the high quality infrastructure to which India is losing out.

Cushman and Wakefield has ranked India the second most risky country among 30 countries for data centers – the backbone for cloud computing environment. The country has been rated low on various parameters including ease of business, inflation, GDP per capita and corporation tax, along with outage challenge. However, the cost benefit and sustainability were the parameters where the country was comparatively ranked higher.

The uncertain power supply and patchy infrastructure, India is losing out on the hardware and storage side of the cloud, however, the Indian IT-BPO providers can still be the nerve centre that integrates various parts of cloud-based technology solutions and delivers it to enterprises across the world. To capitalize on the latter, the Indian IT companies are increasingly partnering with cloud platform providers to integrate the products an enterprise has chosen from the wide array of cloud offerings, and tie those products into the parts of the corporation's IT infrastructure that are still operating on conventional infrastructure.

^{24 &}quot;Public cloud services market to reach \$ 443 million in 2013: Gartner," The Economic Times, 6 May 2013

Case study: Netflix – using cloud computing to become a leader in video distribution²⁶



Netflix has more than 36 million subscribers, who watch over 4 billion hours of programs every quarter on more than 1,000 different devices. On a usual weeknight, Netflix accounts for almost 30 percent of all Internet traffic entering American homes. That is more than YouTube, Hulu, Amazon. com, HBO Go, iTunes, and BitTorrent combined.

Behind these numbers lies the power of the cloud. Netflix has emerged as one of the largest and most sophisticated users of cloud computing. The company rents server and storage systems from Amazon Web Services, the cloud division of Amazon.com. At any moment, Netflix draws upon up to 20,000 servers running in Amazon data centers. The computers handle customer information, video recommendations, digital rights management, encoding of video files, and monitoring the performance of these systems.

Each night, Netflix performs an analysis to see which shows were the most popular in each city. Between 2-5 a.m., it fills its servers with the appropriate programs. When a new device like an upgraded Xbox or a Samsung smartphone comes on the market, Netflix uses thousands of extra servers to reformat movie files and deal with the new users. By day, some servers handle the work tied to streaming video; by night, they're used to analyze data. Netflix has been forced to build from scratch much of the software it needs to manage this operation. Since it relies on Amazon for data centers, its 700 engineers focus on coming up with tools for, say, automating the ways in which thousands of cloud servers get started and configured.

Across industries and geographies, the CXOs I meet on a regular basis are expressing a mixture of bewilderment and excitement at the new technologies, gadgets and the new generation of employees they're encountering at their workplaces. I tell them that the synthesis of mobility, social media, big data, location-enhanced analytics and other recent developments are the new "Ether" that their businesses are immersed in, and must thrive in. Those of you who recall how Ethernet got its name will know what I mean. As regards the new generation of employees, I see them as being more loyal to their work and their social networks than their employers and their colleagues.

Collectively, this defines the new normal I encourage my clients to appreciate and leverage. This new normal will also transform service providers such as Mahindra IT in profound ways. Anticipation of this unfolding transformation is at the heart of our integrated service positioning called NMACS, our organic & acquisition investment strategy, as well as the new SLA and fee models we are piloting with select clients.



CEO, Mahindra Satyam



^{26 &}quot;Netflix, Reed Hastings Survive Missteps to Join Silicon Valley's Elite", BusinessWeek; 9 May 2013 http://www.businessweek.com/printer/articles/115772-netflix-reed-hastings-survive-missteps-to-join-silicon-valleys-elite, accessed August 26, 2013

Daily deals, one of the top choices in 2011 of businesses are witnessing a decline of being a preferable social channel in 2013.²⁷

Per Social Media Examiner's 2013 survey, 80 percent of the respondents stated that they have no plans to leverage daily deals as a part of their social media strategy, down from 72 percent in 2012.

Social Media

Facebook, LinkedIn, Twitter, Foursquare – the new way how businesses and individuals are connecting with each other, globally. Enterprises are increasingly leveraging social media for customer engagement and brand building, as more and more individuals are becoming active Internet users and using social media. Further, the proliferation of smart devices and increasing mobile internet usage has supported the growth of active Internet users.

Social media platforms are not only restricted to the social networking sites such as Facebook and LinkedIn, rather extended to various forms of social media including YouTube, blogs, social bookmarking, geo-location sites, and daily deals. As the social media modes differ, so their application and priority from business to business. Moreover, changing business dynamics influences enterprise decision to select a social media platform.

While daily deals lost its position, platforms like YouTube continues to be top preference of businesses followed by Facebook, blogs, LinkedIn and Twitter.²⁸

YouTube is the chart topper, however, collectively Facebook, LinkedIn and Twitter signifies the importance of social networking in the social media world. Moreover, collectively the social networking sites nearly reach one in four, globally. The social network users are expected to reach 1.73 billion this year, an 18 percent increase from 2012 driven by rising adoption in emerging countries.²⁹

Global Social Network Users, Worldwide, 2011 - 2015 (Billion)



Source: Emarketer, April 2013

Social network penetration, by region, 2013 as percent of total internet users



Source: Emarketer, April 2013

Middle East and Africa region has the highest social network penetration among Internet users, against the North American and European nations, which signifies that active Internet users in emerging markets are more on social network sites than developed nations. Moreover, the absolute number of social network users in emerging nations including India, China, Brazil etc. is more than in the developed nations.

- 28 "2013 Social Media Marketing Report," Social Media Examiner Survey 2013', p 5
- 29 "Social Networking Reaches Nearly One in Four Around the World," eMarketer, 18 June 2013

^{27 &}quot;2013 Social Media Marketing Report," Social Media Examiner Survey 2013', p 8

Social Media in India

Following the global trend, Indians Internet users are also increasingly using social media, which in turn is providing opportunities for enterprises to leverage social media strategy for engaging with customers, brand building, product launches and for knowing their customers. The social media usage is primarily driven by the rising number of active Internet users, who are accessing Internet through host of devices. The mobile Internet users in the country are expected to grow from 4.1 million users in 2009 to 164.8 million in 2015 at a CAGR of 85 percent.





Source: IAMAI, May 2013

Per eMarketer, around 127.5 million individuals are using social networking, with a majority of these on Facebook. Thus, it is increasingly becoming important for enterprises to have a social media strategy for their businesses.

Top Indian brands on Facebook by local fans (millions)



Source: Socialbakers.com, Data as on 1 May 2013



Citibank leverages social media to offer value added service

Citibank, one of the leading banking service providers in India leveraged social media campaign to offer a unique shopping experience during the festive period by partnering with e-tailers. As a part of the campaign, the company undertook following initiatives: driven by rising adoption in emerging countries.

- Uploaded a pendulum shaped cover image of OMG! Sale on Facebook
- A dedicated page was also created on Facebook
- Customized videos referring campaign was uploaded on the Facebook wall
- Also, shared the event links on the brand's Facebook wall

Results

- Citibank card spends grew eight times over average daily spends at the 17
 partner websites
- The average ticket size increased by 30 percent for the partner websites on Citibank cards
- Citibank India Fan page achieved the highest reach ever visits in 2012 –2,095,104 and the highest virality–7.63 percent during the OMG! SaleKey

Leveraging social media has set of benefits, which includes increased exposure, enhanced customer loyalty, improved customer relationship, new customer acquisition and optimized marketing budgets. However, privacy concerns and cultural fabric of the country might hinder the social media growth in the country.

Driven by opportunities in the areas of employee communication, out-of-office productivity, sensor networks and additional customer channels, mobility is one of the most important technologies for banking sector and will have an immediate impact. Other than mobility, the banking sector is witnessing significant impact of social media and embedded systems in the routine functioning. Leading banks are leveraging social networks to offer bank account apps, money personality apps, deal-of-the-day offers, offers on banking products/services and a mechanism for customers to write back to these banks. Data from various social media platforms is also being integrated at the backend in a CRM module to capture customer queries and keep track of all comments about the bank. Embedded systems are also coming to the fore through safe-banking practices.

While the aforementioned technologies have an immediate impact are increasingly being used in the current scenario, technologies such as cloud and big data are also expected to pick up steam in the next 2-3 years, given that concerns around security of customer data and information, data leakage, and unauthorized access are addressed by banks in an effective manner.

Going forward, convergence is clearly on the cards. Convergence would be seen from an applications perspective, where a single platform would be used for various applications to give a single view of the customer.

> Mukesh Jain Chief Technology Officer, ICICI Bank



SMAC and India's IT-BPO Strategy

The past two decades have seen the Indian IT-BPO (Information technology-Business Process Outsourcing) industry grow from strength to strength. The industry expanded from a mere USD 8 billion in 2000 to an estimated USD 108 billion in 2013²⁰, contributing significantly to India's economic progress over the last decade. The industry took advantage of the vast pool of highly skilled resources available at low cost, and rode on the wave of application development and BPM services to spread its wings.

Indian IT-BPO industry revenue



Source: Indian IT-BPO Industry, Revenues 2011-13, Nasscom Strategic Review 2013

Since the 2008 economic downturn, the global economy has lurched from one crisis to another. Worldwide economic growth crashed to less than 2.5 percent in the second half of 2012. A faint recovery at the start of 2013 now appears to have been a false daw²¹.

Back home in India, the GDP grew at a disappointing 4.8 percent in the three month to April, its worst performance in nearly a decade. To make matters worse, the rupee hit a record low of 61 per dollar in the last week of June²². The Indian IT-BPO industry, still dependent on exports for 70 percent of its revenues²⁰, has been directly impacted by this.

During this phase investors started to downgrade their view on Indian IT industry, as they believed the thinning cost arbitrage driver is biting the growth prospects of the industry. Moreover, it was believed that cost arbitrage was the reason behind the existence of Indian IT industry and the enterprises lacked invention and innovation.

²⁰ NASSCOM Strategic Review 2013, pg 12, accessed August 27, 2013

^{21 &}quot;The origins of the financial crisis", Economist, September 5, 2013; http://www. economist.com/news/schoolsbrief/21584534-effects-financial-crisis-are-stillbeing-felt-five-years-article, accessed August 28, 2013

^{22 &}quot;Grim GDP data adds to India's woes", Financial Times, August 30, 2013; http:// www.ft.com/intl/cms/s/0/154e98ec-1176-11e3-a14c-00144feabdc0.html, accessed September 2, 2013

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Walmart set up Walmart Labs to provide a supportive environment for testing new ideas. This has helped Walmart to create new products and services around social media, cloud, analytics and mobility for tapping into the next – generation of consumers.

("Will Walmart Labs make Walmart more innovative in ecommerce", http:// www.digitalsparkmarketing.com/ innovation/walmart-labs/, accessed September 3, 2013)

Four step roadmap for IT-BPO firms to embrace the SMAC era

With the emergence of SMAC, IT-BPO firms need to look at changing their traditional business models. The offshore delivery model, with a mix of onsite and offshore delivery resources, will no longer work in an environment dominated by SMAC. KPMG in India believes that IT-BPO firms will have to re-invent themselves in order to be aligned with SMAC³. and follow a four-step roadmap to emerge successful. The various steps of this roadmap include:

Become more entrepreneurial

IT-BPO firms need to adopt innovation as the cornerstone of their existence, rather than just focusing on traditional ADM (Application Development or Maintenance) or BPO services. Moreover, this innovation needs to be on multiple fronts – across products and services. Firms need to foster a culture that rewards and promotes new ideas and innovation, which must ideally come from the rank-and-file workforce, rather than the top management. Some of the steps IT firms can undertake to promote innovation include²³:

- **Create a safe environment:** Firms must encourage innovation by removing some of the pressure for short-term returns. This enables employees to think about ideas that will bear fruit in the medium to long-term, but might not be able to realize returns in the short-term. Faith and trust in their ideas from the top leadership provides them with the independence needed to truly innovate.
- Enable organizational agility: IT companies must recognize that the roles their employees play must adapt to the changing needs of the marketplace. They should assist employees in moving between functions in order to accumulate a diverse range of experiences that improve their overall adaptability. By giving employees room to explore their full potential and range of interests, IT firms also gain a competitive edge in the talent market.
- **Broaden their horizons:** IT firms need to foster opportunities for new ideas to flourish regardless of their source. Employees must be provided with a platform to bring forward out-of-the box ideas.

Company	Initiative	Investments
Infosys	Has set up a US\$100 million fund to invest in start- ups, besides funding internal innovation	OnMobile, Yantra Corp
Tech Mahindra	Has established a US\$50 million fund exclusively for investments in global technology start-ups	Launched an initiative – i5 Startnet – to scout for firms in SMAC
MindTree	Created a team led by the Chief Strategy Officer to look for start-ups	7Srata
Wipro	Picking up stakes in cloud and big data firms	Opera Solutions, Axeda
TCS	Formed its Innovation Labs and Co-Innovation Network (COIN) to bring together academic institutions, start-ups, venture funds and clients	iKen Solutions, Perfecto Mobile, Computational Research Laboratories
Cognizant	Set up an emerging business accelerator	Incubated over 20 ideas

Innovation examples at Indian IT vendors²⁴

- 23 "Best practices for leading via innovation", Rick Lash, August 6, 2012; HBR blogs, http://blogs.hbr. org/cs/2012/08/best_practices_for_leading_via. html, accessed September 3, 2013
- 24 "Indian IT companies look for start-ups to drive competitiveness", Nitish Mittal, August 13, 2013; Everest Group, http://www.everestgrp.com/2013-08-indian-it-companies-look-for-start-ups-to-drivecompetitiveness-sherpas-in-blue-shirts-11782.html, accessed September 4, 2013
- **Promote collaboration:** IT firms should facilitate innovation by encouraging, measuring and incentivizing collaboration. When employees share insights and ideas with one another, they receive valuable feedback which helps them further improve these ideas.

Embrace hub and spoke delivery model

While the first generation of global delivery model (GDM) was driven by lower communication costs, the convergence of disruptive technologies will drive the next-generation of the GDM. Companies will need to evolve their business processes to succeed in the new paradigm²⁵. While IT-BPO vendors have already started incubating Centres of Excellence (CoE) to innovate in some of the SMAC technologies, it will take much more to harness the true potential of SMAC. This innovation cannot exist in divisional or geographical silos, but must be a collaborative effort of the entire organization.

KPMG believes that a hub-and-spoke delivery model, specifically a 'hub-with-shared spokes' delivery model will be the most optimal solution for embracing the full potential of SMAC technologies.

Responsibilities of hubs and spokes²⁵

Responsibilities of a hub	Responsibilities of a spoke
Allocate work to spokes, and provide a seamless customer experience	Work with the hub in delivery/ innovation
Monitor performance	Achieve excellence in specific capabilities
Cross-pollination of ideas and skills across spokes	Ensure optimal use of available resources

The key features of a hub-with-shared spokes delivery model are given below²⁵:

Key characteristics

Each hub would have a network of spokes while each spoke can service multiple hubs. The hubs would set the innovation and quality standards, manage risks, operating procedures, work allocation, and ensure compliance of the spoke specific to its area. Spokes can have internal dedicated teams (for each of the SMAC technologies) to cater to its set of hubs. The responsibility of team allocation may lie with the spokes though it will be done in consultation with the respective hubs.

Governance mechanism

Since spokes are reporting to multiple hubs, there would be a thin management

layer handling the overall operations of the spokes as it requires some degree of co-ordination and smooth flow of communication for ease of operation. Management control of the projects lies at the hubs while spokes ensure job completion and regulatory compliance. In operations, it is the hub which take decisions on work allocation and delegates it to the spokes though the discretion to allocate dedicated resources may lie with the spokes, in this case.

Suitable scenario

A spoke is usually shared when it functions as a large delivery center that supports multiple competencies along verticals and/or horizontals. This model is suited when spokes have skill-sets which maybe a common requirement at more than one hub, for example excellence capabilities in mobility and social media.



25 "Hub and spoke operating model: A new business paradigm for the Indian IT-BPO industry", KPMG, February 2013; www.kpmg.com/IN/en/IssuesAndInsights/Hub-and spoke-model.pdf, accessed September 5, 2013

26 "Non-linear models: Driving the next phase of growth for the Indian IT industry", KPMG, January 2012; http://www.kpmg.com/in/en/issuesandinsights/ articlespublications/pages/kpmg-cii-non-linearmodels-drivingthenextphaseofgrowthfortheindianitindustry.aspx, accessed September 5, 2013

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New pricing models

The current business climate has compelled customers to reevaluate their existing and new contracts with service providers, who, are moving to high-value, innovative service offerings like consulting, SMAC, which demands a different pricing paradigm. Indian IT companies have been pricing based on Time and Material (T&M) and Fixed Price (FP) models, which are linked to headcount and effort spent. Nonlinear pricing models on the other hand, link clients' expenses to their business outcomes or usage. Billing is no longer based on effort and revenues are linked with productivity ensuring vendors share productivity gains with clients. This is fast emerging as a win-win proposition for both the client and the service provider as both parties share the risk²⁶.

Non-linear pricing models result in higher revenue productivity per employee and improved margins for companies. Analysts estimates a margin gain of ~1 percent for every ~5 percent move to non-linear revenues owing to their better margins compared to traditional services²⁶. But in order to better leverage the different pricing models available, companies need to increase its level of adoption in application outsourcing services – which form a majority of their current revenues. Success in non-linear pricing management depends on the ability to isolate and measure business drivers or KPIs. Also, non-linear pricing models can be perfected only with sufficient data points and experience which can act as a guiding factor to decide on key KPIs and outcomes²⁶.

This will mandate building of comprehensive baseline repositories. Lastly, a "Consultative" front end will need to be created engaging with key stakeholders at various levels to gather business insights, obtain buy in and drive change that will ultimately deliver business results.

Collaboration with other vendors

With the dawn of the SMAC era, technology vendors find themselves positioned in one of the two categories – traditional IT-BPO service vendors who lack expertise in all SMAC technologies, and emerging technology firms who specialize in one or multiple SMAC technologies. Both categories of firms lack something that the other can provide. In such a scenario, vendors need to embrace a collaborative strategy – that enables them to compliment their own strengths with those of firms in the other category.

This collaborative model can take many forms; some of the key models include3:

- Partnership: Firms can enter into a formal alliance or partnership to focus on specific SMAC technologies. In such a scenario, firms will tend follow a joint Go-to-Market strategy that highlights the strengths of the partnership.
- White labeling: A larger IT-BPO technology vendor will integrate a SMAC solution offering of a smaller technology vendor, and present it as its own offering to the client.
- **Re-selling:** A larger IT-BPO technology vendor will use a SMAC solution offering from a smaller technology vendor, and present a collaborative solution to the client.

No single vendor, no matter how large, can gain expertise in all SMAC technologies in this fast moving environment, and adopting a collaborative model can be the difference between success and failure in such an environment.



Conclusion

The evolving technology industry has opened new gates for the Indian IT-BPO vendors in the form of nexus of four forces – SMAC (Social Media; Mobility; Analytics; Cloud). As the enterprises globally adopt new technology formats for operational efficiency, cost optimization and for additional business advantages, to address this and growth issues, Indian IT-BPO vendors can develop their SMAC strategies.

SMAC collectively is considered to be a multibillion dollar opportunity, globally for the IT-BPO vendors. The enterprises are increasingly adopting these technologies, as they become more agile with information sharing within organization and seek more insights about their customers to serve them better.

SMAC has the potential to be a multibillion dollar opportunity in the forthcoming years.

IDC estimates that the world ICT spending will reach the US\$5 trillion mark by 2020 driven by the combination of social media, mobility, analytics, and cloud. In 2012, SMAC approximately contributed about 20 percent of the total ICT spending and they are collectively, growing at about 18 percent year-on-year, i.e. around six times the rate of the rest of the IT industry. At this rate it is expected that these technologies will become 80 percent of the total spending by 2020. **Social media** would help IT-BPO firms to capitalize on the growth generated by the increasing usage of social media by consumers and businesses

Mobility to offer two pronged growth path of enterprise mobility and consumer mobility

SMAC enables enterprises leverage the cloud for storing huge volumes of multistructured customer data, generated over mobile devices and social media and analyze these data sets for business advantage

Analytics to drive businesses through the way of big data, business intelligence and analysis of multistructure high volume datasets **Cloud** computing will provide the solutions for IT-BPO companies that would help them to offer more cost optimzed solutions to their clients

The Indian IT-BPO vendors that have been struggling to find the new wave growth are expected to be benefited from the growing prevalence of SMAC. Moreover, it is assumed that a proactive approach would lead SMAC technologies to help the India IT-BPO industry to cross the US\$ 225 billion mark by 2020. Further, the Indian IT-BPO players have already started to develop their strategies around SMAC. While top IT-BPO players are trying to venture in each of these forms of technology through organic and inorganic path, niche and pure-play players are trying to build their expertise in one of the forms of the technology.

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The impact that SMAC can have on making businesses agile in today's fast changing world is undeniable. It helps in instant availability of information & intelligence and importantly, enables immediate action based on this intelligence gained. However, it is important to ensure these solutions are implemented as strategic initiatives and not as point solutions, to gain the maximum from any SMAC initiative.

Anand Ramakrishnan

VP & Business Head- Managed Services, Cloud and Microsoft Services, HCL Infosystems Limited

> For example Infosys, the second largest Indian IT-BPO vendor has announced its Infosys 3.0 strategy wherein they will focus on cloud computing and mobility as well as separately launched solutions in the field of social media and analytics. The company's social media solution is known as SocialMedia Edge. In another initiative Wipro acquired US based Opera that would help

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Advanced & Prescriptive analytics will change the decision making paradigm substantially over the next 3 years. A lot more real time decision making will happen based on data. Taken to its logical conclusion, human experts will still be required, but only for a few select cases rather than across a broad spectrum. Data driven prescriptive analytics will come centre stage

Mallinath Sengupta

Senior Vice President Specialized Market Unit (Analytics/Mobility), Mphasis Limited

Wipro to expand in big data analytics space as it combines Opera's machine learning expertise, pre-discovered predictive signals and algorithms with Wipro's technology expertise.

While there will be macro issues pertaining to these technologies, which have been discussed earlier the companies have immense opportunity in the segment.



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KPMG in India, was established in September 1993. The firms in India have access to more than 4500 Indian and expatriate professionals, many of whom are internationally trained. As members of a cohesive business unit they respond to a client service environment by leveraging the resources of a global network of firms, providing detailed knowledge of local laws, regulations, markets and competition. KPMG has offices in India in Mumbai, Delhi, Bangalore, Chennai, Chandigarh, Hyderabad, Kolkata, Pune and Kochi. We strive to provide rapid, performance-based, industry-focused and technologyenabled services, which reflect a shared knowledge of global and local industries and our experience of the Indian business environment.

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About Cll

The Confederation of Indian Industry (CII) works to create and sustain an environment conducive to the development of India, partnering industry, Government, and civil society, through advisory and consultative processes.

CII is a non-government, not-for-profit, industry-led and industry-managed organization, playing a proactive role in India's development process. Founded over 118 years ago, India's premier business association has over 7100 members, from the private as well as public sectors, including SMEs and MNCs, and an indirect membership of over 90,000 enterprises from around 257 national and regional sectoral industry bodies.

CII charts change by working closely with Government on policy issues, interfacing with thought leaders, and enhancing efficiency, competitiveness and business opportunities for industry through a range of specialized services and strategic global linkages. It also provides a platform for consensus-building and networking on key issues.

Extending its agenda beyond business, CII assists industry to identify and execute corporate citizenship

programmes. Partnerships with civil society organizations carry forward corporate initiatives for integrated and inclusive development across diverse domains including affirmative action, healthcare, education, livelihood, diversity management, skill development, empowerment of women, and water, to name a few.

The CII Theme for 2013-14 is Accelerating Economic Growth through Innovation, Transformation, Inclusion and Governance. Towards this, CII advocacy will accord top priority to stepping up the growth trajectory of the nation, while retaining a strong focus on accountability, transparency and measurement in the corporate and social eco-system, building a knowledge economy, and broad-basing development to help deliver the fruits of progress to all.

With 63 offices, including 10 Centres of Excellence, in India, and 7 overseas offices in Australia, China, Egypt, France, Singapore, UK, and USA, as well as institutional partnerships with 224 counterpart organizations in 90 countries, CII serves as a reference point for Indian industry and the international business community.

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