

EXPRESS Technology Senate 12

What CIOs Want

SMAC: The paradigm shift

Creating future of the
enterprise



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Foreword

About the survey

Over the years adoption of SMAC technologies has been growing in India.¹ KPMG in India and Express Computer has conducted the 'KPMG in India - Express Computer SMAC Survey' as a precursor to this paper. The survey was conducted through an online questionnaire and participants from the likes of CIOs, CISOs, and related professionals from across India responded to the survey.

Social, Mobile, Analytics, and Cloud; the quadruplet popularised as the acronym SMAC are continuing the next wave of IT transformation which began with Web2.0. Interestingly, each of these four pillars touch every aspect within the organisation. Social is key to business stakeholders, mobile touches the end users i.e. employees, analytics is key to the Chief Executive Officer (CxOs) and leadership, while cloud is a game changer for the IT department itself, and all of them taken together are driving consumerization of the IT creating an opportunity for CIOs to transform their role as business drivers rather than mere enablers of business decisions.

While we discuss the length and the breadth of SMAC technologies, their impact on organisations, state of their adoption by the industry, and effective methods to manage them, it is important that we take notice of some of the new trends. According to Gartner,² by 2020 there will be up to 30 billion connected devices with unique IP addresses, and this revolution is being called the Internet of Things.

As we generate more data from our mobiles and 'connected things', the number of privacy concerns being raised by citizens and security concerns raised by governments is on the rise. Securing information handled by SMAC technologies and addressing privacy concerns resulting from their usage is as important today as is aiding the adoption of SMAC. Indeed, as SMAC technologies get absorbed in the IT fabric of organizations, challenges for organizations will change from driving adoption to balancing benefits realization with the security and governance concerns.

When we set out to develop this thought leadership, we realized that answers to questions raised are still evolving, and hence we set out to survey CIOs/CTOs across the industry on the state of SMAC adoption in their organisations. This paper is an outcome of the analysis of the survey results juxtaposed with the collateral information about SMAC and emerging trends relating to them.

We hope that the collective knowledge of KPMG and the CIOs/CTOs polled for the survey is useful in overcoming some of the teething troubles and managing SMAC technologies within your enterprise.



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1. <http://www.infotechlead.com/2014/05/02/social-mobile-analytics-cloud-smac-set-next-wave-growth-indian-industry-22376> - 8-Sep-2014

2. <http://forwardthinking.pcmag.com/show-reports/304187-gartner-2012-your-it-infrastructure-will-become-obsolete>





Social media

India with 243.2 million internet users and 106 million active social media users³ is on its way to becoming a nation of wired citizens. Even with a Social media penetration of just 8 per cent, organisations cannot afford to overlook the power of accepted channels to assist them in doing business better and to increase productivity.

A novelty couple of years ago; social media today can seem to many as a necessity. The countless array of internet based tools and platforms have increased and enhanced the sharing of information.

Customers often expect organisations to respond to Social media interactions in the same way as they themselves do for their personal interactions i.e. immediate. The ubiquitous nature of social media makes it possible to post a reaction anywhere, anytime, and even on anything. A positive or negative

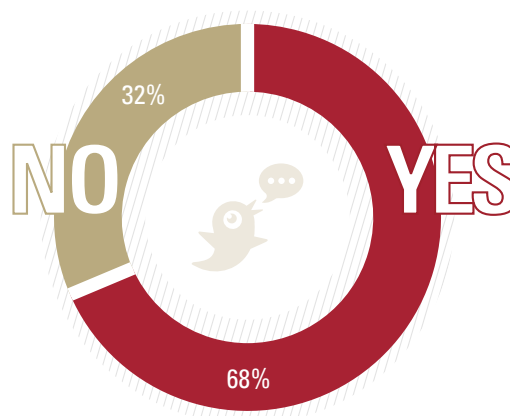
may impact the brand or the image of the organisation, and thus pressing the need for social media Governance. Customers may interact with a billboard advertisement or a newspaper report using photos of them on social media platforms. These expectations now demands that organisations manage their online content proactively.

Many businesses are rapidly deploying strategies to monetize their social media presence and achieve measurable results. However, social media governance is an increasingly important trend, and special

care should be taken to safeguard a company's reputation while utilizing the potential of social media channels.

According to the KPMG in India - Express Computer SMAC Survey; 68 per cent of the respondents allow access to Social networks, while 32 per cent of these do not have a social media policy for acceptable usage of social media websites.

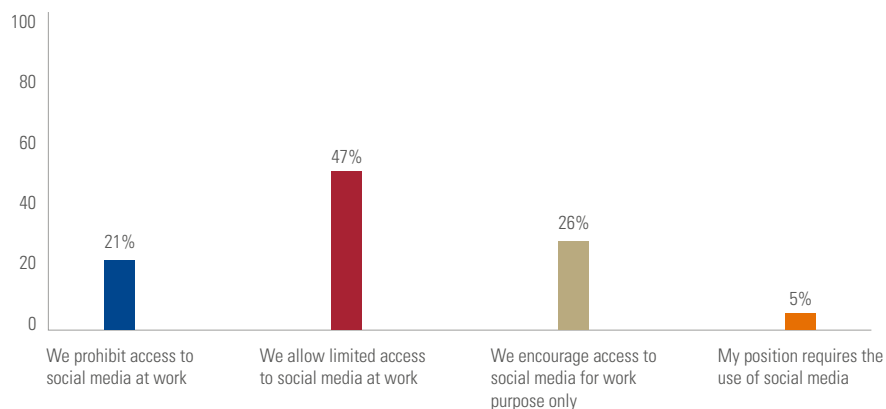
Social media policy for acceptable usage



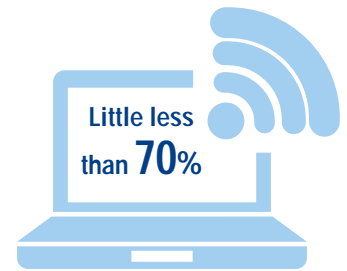
Source: KPMG in India - Express Computer SMAC Survey

3. <http://www.techinasia.com/india-web-and-mobile-data-2014-now-shows-106-million-active-social-media-users/>

Access to social media at work



Source: KPMG in India - Express Computer SMAC Survey



Respondents are already using social media channels to aid their business.

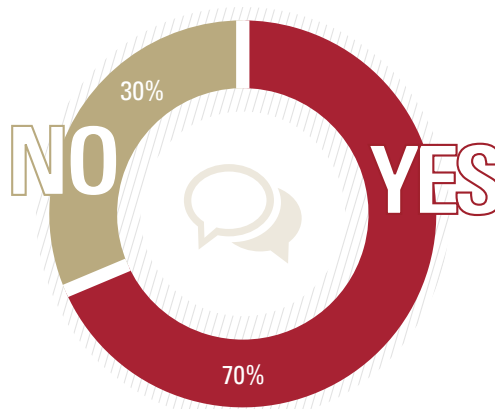
Opportunities and trends

Social media emerged around a decade ago and has become a medium to reckon with due to its revenue generation potential. Promoting a company's brand; engaging with customers, and improving sales are just few of the many opportunities provided by social media channels.

As platforms evolve, there are new media trends to take advantage of. Social networks can support businesses by strengthening and expanding the network of contacts, and can turn into powerful vehicles for lead generation, customer management, complaint redressal, and brand strengthening. Many brands are already embracing Micro Videos as a powerful marketing

tool while investing heavily on social media Advertising. With time, social media advertisements seems to have become more refined and many major platforms now offer targeted advertising which provide more value for money compared to traditional broadcast media's one size fits all campaigns. Companies are focusing on social media and revenue generation through it rather than focusing on 'likes,' 'retweets' and other vanity metrics. Businesses now track metrics like leads, website traffic, conversions and revenue generated. Accordingly, as per the KPMG in India analysis, a little less than 70 per cent respondents are already using social media channels to aid their business.

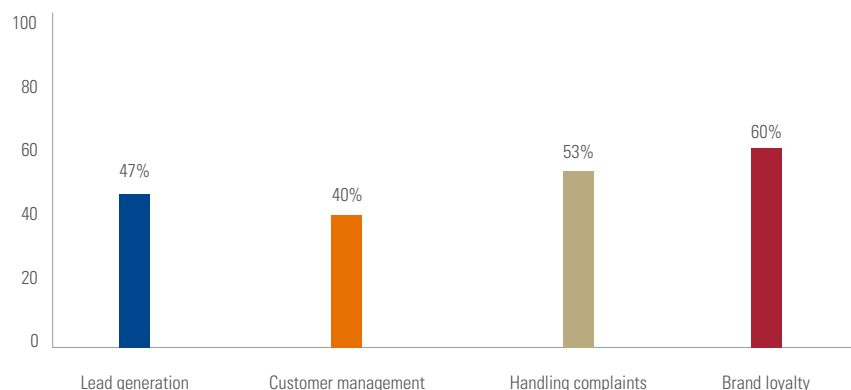
Use of social media channels for Business



Source: KPMG in India - Express Computer SMAC Survey

Usage of social media platforms is spread across use cases of lead generation, customer management, complaint redressal, and brand loyalty.

Measurable goals achieved by using social media Tools



Source: KPMG in India analysis



58% Companies that use social media tools to interact with their prospects and customers are more likely to have a significant competitive advantage over those that do not.



47% organisations believe that these channels have helped them in generating potential leads



40% believe that they help in managing the customers



53% believe that they help in handling complaints



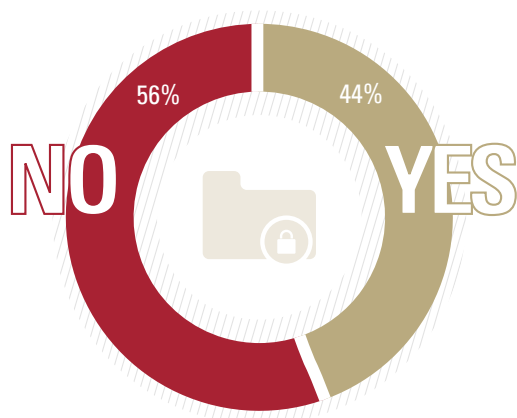
16% respondents use a specialised software/tool to manage communication via social media

Challenges

While these 'must have' channels may have fundamentally changed the way businesses operate; the risk of data leakage, brands being trolled, customer complaints blown out of proportion, employee poaching, loss of competitive advantage due to leak of information about confidential projects, etc. cannot be separated from their usage. Limiting the content published and monitoring social media usage by employees is a knee jerk reaction observed in several organisations.

As per the KPMG in India - Express Computer SMAC Survey, the majority of respondents are concerned about potential data leakage that exists due to social media, and as a result over 44 per cent have published a separate set of terms for privacy/data leakage on their social media pages, in addition to the standard terms that social networking sites offer to protect exposure of personal/confidential data.

Organisations having separate set of terms for Privacy/Data leakage



Source: KPMG in India - Express Computer SMAC Survey

As social media evolves to social business, organisations are required to integrate social business and compliance into their corporate culture. social media governance model is a mix of policies, guidelines, procedures, and educational resources to guide organisations to represent as well as attempt to limit the leaks brand/reputation risk.

Social media has the power to redefine an organisation's brand in one inadvertent or ill-conceived post, and with presence on multiple social media platforms, organisations are exposed to this risk at all times. In addition to a social media policy, it is imperative for

every organisation to have a social media Resilience and Crisis Management plan and impart essential training to its employees on how to respond to content that brings down the organisation's brand and questions its integrity.

Social media governance may not be only an IT department or Marketing department subject but should involve all stakeholders viz. legal, operations, finance, and even human resources, to establish leading industry practices and create benchmarks for excellence.

Social media has altered the way many organisations work and will likely

continue to have a significant impact going forward. Lacking presence on channels like LinkedIn, Facebook, Twitter, etc. could be a strategic miss for organisations looking to create an impact in the digital and real world alike. Users may not be able to extract the value of mobile channels unless they know what has gone mobile. This is where Social media can come into play. Businesses with an intelligent social media strategy which include appropriate usage balanced with governance can do wonders in a connected world.





Mobility

The world has seen an unprecedented growth in the number of mobile subscriptions in last few years, and India has been at the epicenter of this growth. To put things in perspective, out of the 120 million new mobile subscribers added in Q1 2014, 28 million were from India,⁴ i.e. one in every four mobile subscriptions were added in India. This growth in mobile subscriptions was also reflected in the number of smartphones sold and the number of mobile broadband users.⁴ India is finally seeing a shift from feature phones to smart phones which are continuously adding hardware and software capabilities with each release.

Traditionally only certain devices were seen as 'Business Phones', but the scenario has completely changed now. The entry of newer mobile platforms and ever increasing processing capabilities on mobile devices offer an opportunity for enterprises to jump on the mobile bandwagon.

Mobility is the front runner in the race of digital technologies (among the other technologies including social, analytics, and cloud) that enables business growth.⁵

Mobility has also radically changed the working environment in Indian enterprises. It has created a demand for enterprise data and access to key

applications to be ubiquitous; while greatly increasing responsiveness and efficiency among the workforce enabling business decisions in 'real-time'. The cascading effect of such ubiquitous access on productivity has also made enterprises favour adoption of enterprise Mobility with greater rigour.

Trends in enterprise mobility

Ever increasing computing capabilities of mobile devices, coupled with strong broadband connectivity is being leveraged by enterprises by adopting Bring Your Own Device (BYOD), releasing Mobile Applications, and providing Enterprise Applications on-the-go. BYOD allows employees to use personal

devices to access confidential business applications. Employees often prefer to use a single device of their choice for work as well as personal use, instead of carrying two separate devices; and by enabling employees to use enterprise applications on personal mobile devices, companies endeavour to boost employee productivity and efficiency. BYOD helps bridge the gap between employee expectations and enterprise requirements.

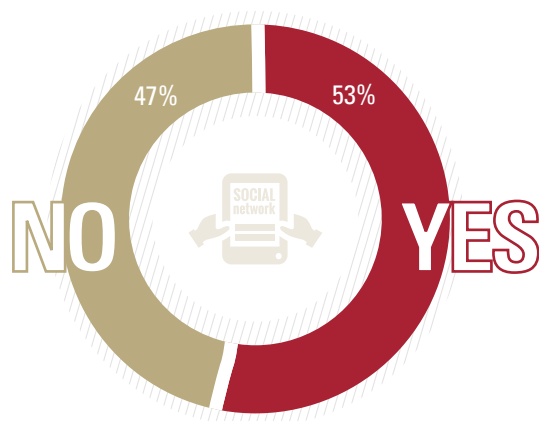
We surveyed the top CIO/CTOs in the industry via the KPMG in India - Express Computer SMAC Survey on their enterprise Mobility strategy, and over 53 per cent of them responded to have BYOD in place.

4. <http://www.ericsson.com/res/docs/2014/ericsson-Mobility-report-june-2014.pdf>

5. <http://www.accenture.com/us-en/Pages/insight-Mobility-trends-research-2014.as>



Organisations having implemented BYOD initiative

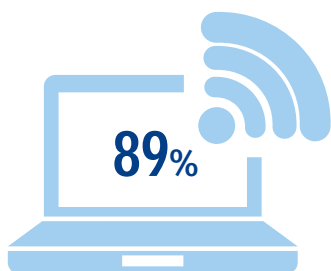


Source: : KPMG in India - Express Computer SMAC Survey, Sep 2014

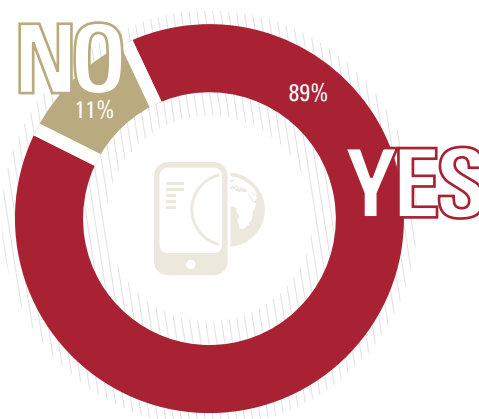
However, there are certain risk aspects associated to BYOD; the primary concern being security of enterprise data. Sensitive business data stored locally on

personal mobile devices can represent a significant risk. The risk is amplified in case of loss/theft or employee a leaving the organisation.

Governance, Compliance, and Security policy for Mobility



Organisations have implemented a governance, compliance, and security policy to safeguard enterprise data and enable mobility.



Source: : KPMG in India - Express Computer SMAC Survey, Sep 2014

Data and knowledge are increasingly being recognized as key corporate assets in the new-age economy, and security of enterprise data is considered to be of utmost importance to organisations. According to the KPMG in India - Express Computer SMAC survey, 89 per cent of the respondents have implemented a governance, compliance, and security policy to safeguard enterprise data and enable Mobility.

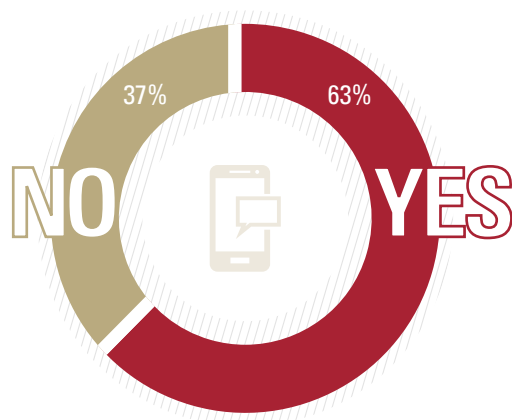
Additionally, privacy of personal data on employee devices is also a significant concern; which may attract legal action if not managed appropriately.

In order to balance the risks posed by BYOD programs, many enterprises are

deploying Mobile Device Management (MDM) platforms which enforce certain baseline configuration on devices. Traditionally, MDM enables the system administrator to enforce security settings on the mobile device. However, enforcing corporate security settings on a personal device should be done in such a manner so that there is no privacy breach of the user's personal information.

As per the KPMG in India - Express Computer SMAC Survey, over 62 per cent respondents have a Mobile Device Management (MDM) solution in place to manage and secure mobile devices used for corporate emails and data access.

Organizations with MDM in place



Source: : KPMG in India - Express Computer SMAC Survey, Sep 2014

In order to limit the organisation's control to specific applications, Mobile Application Management (MAM) is also coming into play. Many enterprises are now realizing that it is more important to manage the applications rather than devices.

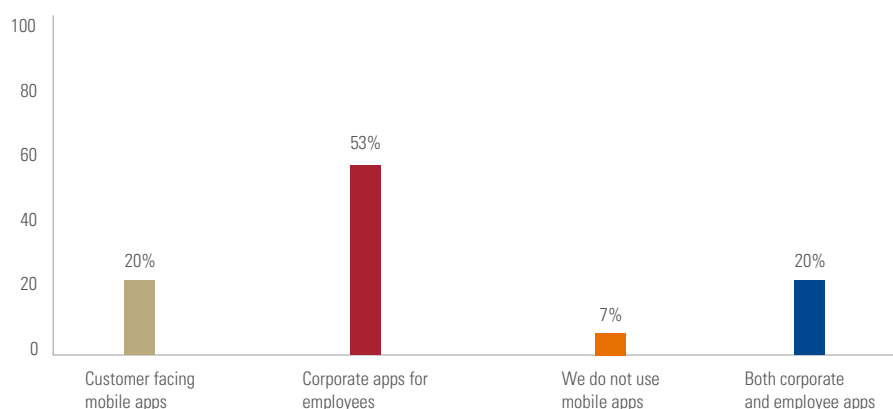
MAM enables organisations to control the use of enterprise applications on mobile devices via specially generated passwords. Also, in case of loss/theft, organisations can leverage MAM to wipe out enterprise data on applications rather than disabling the device. Employees are also more comfortable with MAM as it allows them to retain control on personal applications and data on their devices.

Mobile applications

While we have discussed device strategy and its management, a critical component of enterprise Mobility is applications.

As per the KPMG in India - Express Computer SMAC Survey, 53 per cent of the respondents used corporate applications for their employees, whereas 20 per cent of them used customer facing mobile applications. 20 per cent of the respondents said they use both types of applications, whereas 7 per cent said they do not use mobile applications at all.

Types of mobile applications used

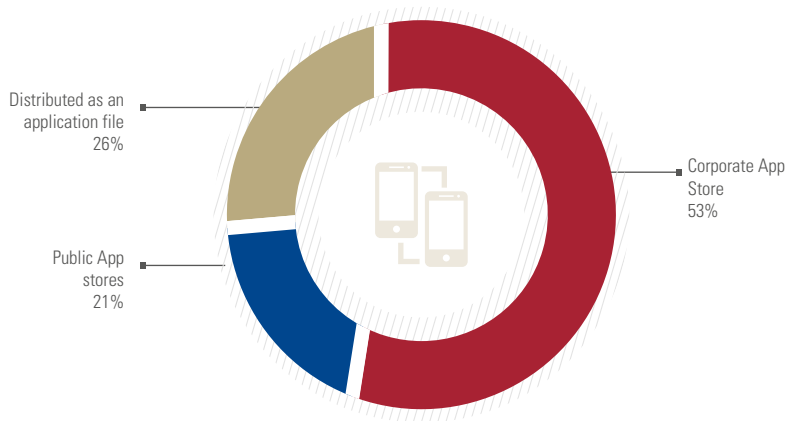


Source: : KPMG in India - Express Computer SMAC Survey, Sep 2014

A key question hence for corporate is to choose a method to deliver these corporate applications. These applications can either be distributed as installable from the intranet, or corporates can deploy their own app stores. Corporate application stores can also be adopted by enterprises to provide the users with a platform to get the tested and updated on-the-shelf and off-the-shelf applications, just at one place. Corporate

app stores can not only provide a water-tight control but also provide security over the mobile enterprise applications. It can also reduce the risk of users erroneously downloading malicious applications camouflaged as enterprise app that can be a threat to the user's mobile device, and thereby enterprise data. IT can enforce access control based on the user profiles within the app store.

Hosting of mobile applications



Source: : KPMG in India - Express Computer SMAC Survey

Our survey revealed that the use of corporate app stores is growing. Over 53 per cent of the respondents said their organisations' enterprise applications are stored at corporate app store, whereas 21 per cent said they use public app stores. The rest distributed their applications as an application file.

License management and audit requirements can be met by the insights these app stores provide on the usage of an app by a user. Chargeback mechanism can also help in realizing the operating cost of applications among departments.

The platform creates a trust environment that at the next level can be extended to vendors, suppliers, and customers.

Embracing the Enterprise Mobility may no longer be a choice for organisations but a business requirement. Enterprise Mobility is allowing organisations to realize the benefits of both worlds; employees have access to Social media, personal emails in office, and enterprises can expect the employees to be working even when they are on the move or at home.



53% of respondents said their organisations' enterprise applications are stored at Corporate App store



21% said they use public app stores



26% distributed their applications as an application file



Analytics

Sensitive Information BIG DATA
Privacy **Analytics** Search
COUCHDB
Cloud and Mobility **Advanced**
CASSANDRA Compliance to business rules
LAW Data Ware house **MONGODB**
HADOOP **Regulations**

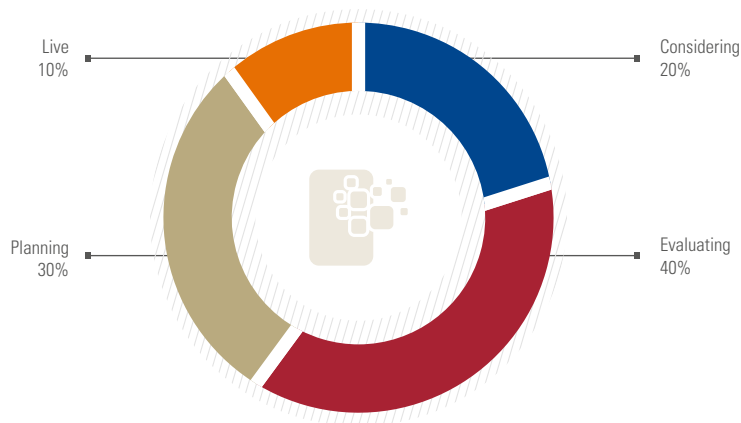
Analytics is the science of examining data to discover underlying information and patterns. While analytics has been around for a long time under different forms and names such as management information systems, business intelligence and data warehousing, two events have brought it to limelight: the rise of mobile and social media and their ability to churn huge volume of analysable data and the rise of Cloud which enables companies to run large scale analytics using Big Data tools like Hadoop™ in Cloud datacenters.

Big Data, a popular form of analytics algorithms, offers a suite that comprises of software and infrastructure platforms and advanced analytics that can provide meaningful and contextual insights and real time data analytics.

Big Data refers to the volume, variety, and velocity of structured and unstructured data pouring through networks into the processors and storage devices, along with the conversion of such data into business advice for enterprises.⁶

India could be considered to be at the initial stages of adoption of Big Data in Analytics based on the survey result. According to the KPMG in India - Express Computer SMAC Survey, 10 per cent of the respondents have implemented Big Data analytics. 20 per cent of the respondents are considering utilizing Big Data, 40 per cent of the respondents are in evaluation stage, and 30 per cent of the respondents are in planning stage.

Stages at which Big Data is currently being being used



Source: : KPMG in India - Express Computer SMAC Survey, Sep 2014

06. The Importance of 'Big Data': A Definition." Gartner. Retrieved 21 June 2012.

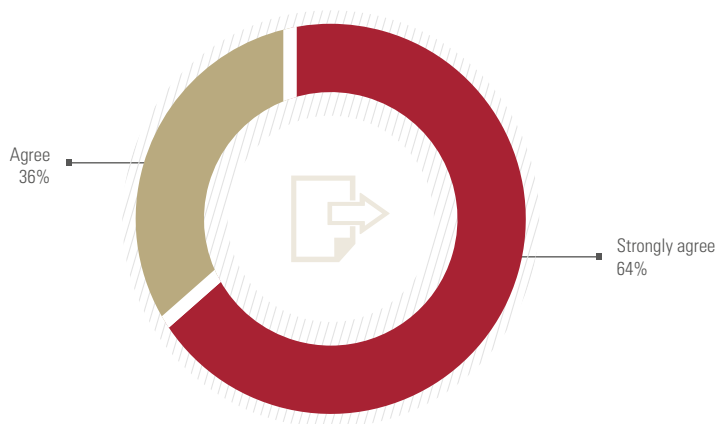


Big data analytics trends in India

Social media processes real time data daily embraced from burgeoning data sources, pressure on margins and regular innovation in business models, continuous and ongoing consolidation, and non-traditional competitors. Adoption of Big data is enabling these segments to achieve cost reduction and efficiency improvement.

According to the survey, 36 per cent of the respondents agree and 63 per cent of the respondents strongly agree that the growth of unstructured data is causing the business shift from traditional Business Intelligence tools to Big Data analysis. Not surprisingly, none of the respondents surveyed disagreed with the inference.

Is the growth of unstructured data causing the business shift from traditional Business Intelligence tools to Big data analysis?

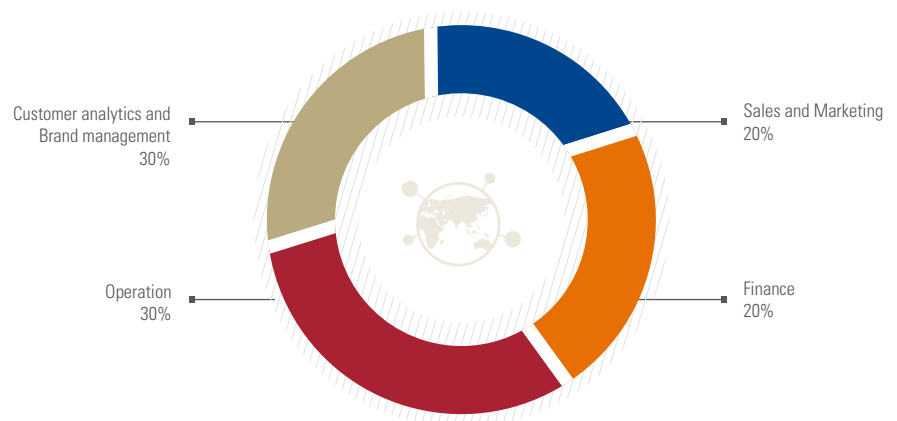


Source: : KPMG in India - Express Computer SMAC Survey

Analytics and its growth is often an organisation wide phenomenon. According to the KPMG in India - Express Computer SMAC Survey, of the organisations that have already

implemented big data, finance, operations, customer analytics and brand management, sales and marketing departments have been exposed to big data Initiatives.

Areas which Big Data Initiative address



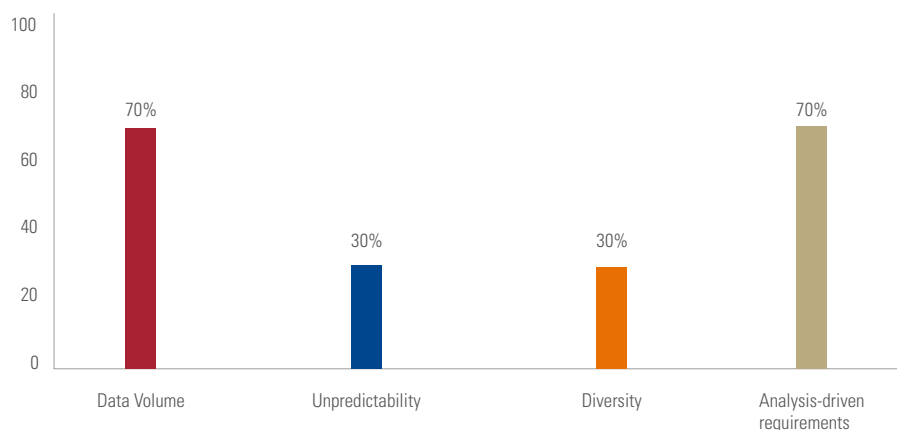
Source: : KPMG in India - Express Computer SMAC Survey

Pre-assessment to be done to understand and agree on the approach to data analytics:

The organisation needs to thoroughly assess the reason for which Analytics implementation is required and understand the various data entities within itself, and how these data entities can be responsible for effective and efficient implementation of Big Data Analytics. Also, the organisation needs to collaborate all its business rules with big data analytics.

What do you think is a major driver for Big Data? Is it Volume, Predictability, Diversity, or the Requirements itself? The KPMG in India - Express Computer SMAC survey revealed 70 per cent of the respondents think data volume and analysis-driven requirement are major drivers, whereas 30 per cent of the respondents chose Unpredictability and Diversity each.

Drivers for adoption of Big Data by organisations



Source: : KPMG in India - Express Computer SMAC Survey

Deeper integration of analytics in strategic decision-making:

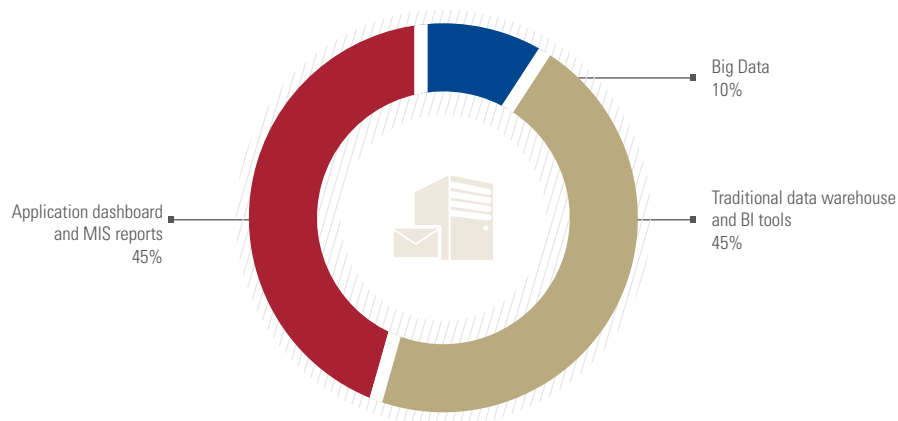
Due to the complexities business organisations face in the consumer environment, many CXOs are implementing Analytics more and more for their tactical decision making and pattern-reading. As the implementation is increasing companies, developing Analytics-based platforms are seeing rise in their revenues compared to the previous years.

As per the leading organisations implementing analytics in India, open source solutions like Hadoop and MapReduce are competing against

existing enterprise software. These are attractive options for startup companies. This is in addition to the presence of traditional in-application dashboards or Business Intelligence tools.

According to the KPMG in India - Express Computer SMAC Survey, 10 per cent of the respondents use Big Data as their primary analytics tools, whereas over 45 per cent of the respondents still use traditional Data Warehouse and Business Intelligence tools, Application dashboards and Management Information Systems reports for analytics.

Types of analytics tools used



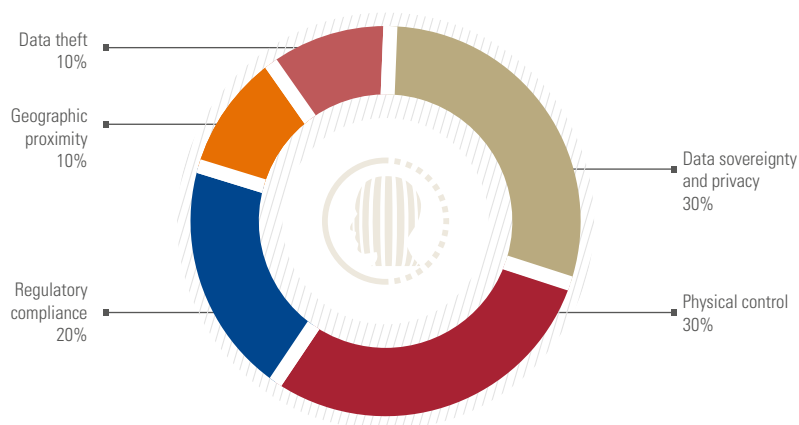
Source: : KPMG in India - Express Computer SMAC Survey

Security and Privacy

While Big Data and the ease to adopt it in the age of Cloud might lead to a potential boom for consumer facing enterprises, several organisations adopting Big data and Advanced analytics are more concerned about data privacy and security. Striking a balance between insights developed with the implementation of Big Data and the security threats involved can be a major challenge.

According to the KPMG in India - Express Computer SMAC Survey, 30 per cent of the respondents think Data Sovereignty and Privacy and Physical Control is a barrier for adoption of Big Data, whereas 20 per cent of the respondents think Regulatory Compliance is a barrier. 10 per cent of the respondents feel Geographic proximity and Data Theft are also barriers for the adoption of Big Data.

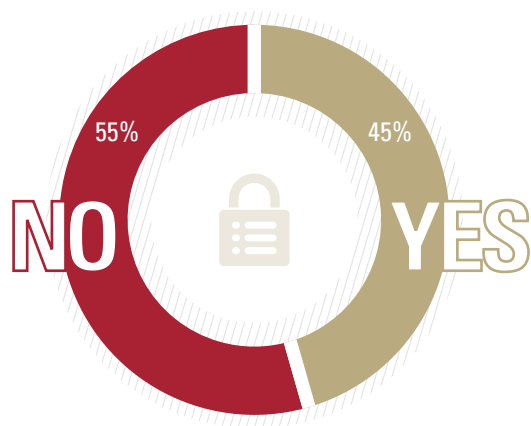
Barriers for the adoption of Big Data



Source: : KPMG in India - Express Computer SMAC Survey

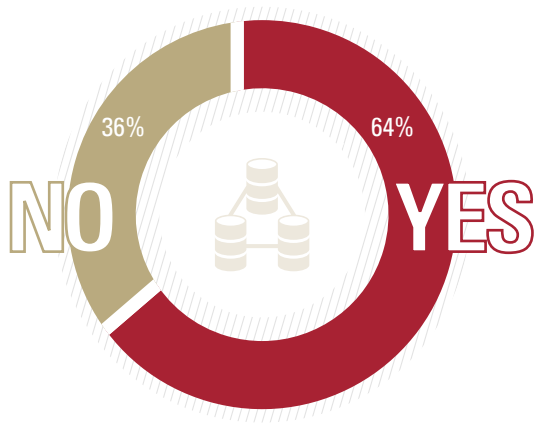
According to the KPMG in India - Express Computer SMAC Survey, Security is one of the prime reasons as to why organisations have not adopted Big Data initiatives.

Organisations have a governance, compliance, and security policy or framework outlined for Big data initiatives



Source: : KPMG in India - Express Computer SMAC Survey

Data Security concerns holding back adoption of Big data

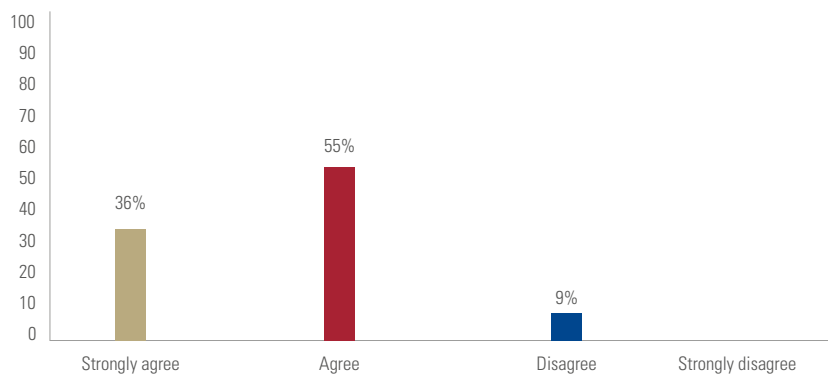


Source: : KPMG in India - Express Computer SMAC Survey

According to the KPMG in India - Express Computer SMAC survey, over 55 per cent of the respondents agree and 36 per cent of the respondents strongly agree that they comply with the privacy requirement to anonymize individual's Personally identifiable information

(PII) before applying Big Data analysis, especially with regards to financial and medical information. Nine per cent disagreed on complying with the privacy requirement to anonymise the individual's PII before applying Big Data analysis.

Response to comply with the privacy requirement before applying Big Data analysis



Source: : KPMG in India - Express Computer SMAC Survey

Challenges

Organisations are not able to exploit Big data and Analytical tools:

Many organisations are still not able to develop connection with disparate data that needs to be pulled to make sense, and thereby garner full information relevant to their business. The real ability is to see data's true potential.

Better integration of Big data analytics with the existing data warehousing systems:

Big Data generally involves information from unstructured sources such as social media, web sensors, and emails which do not fit easily into the traditional data warehousing system. The Advanced Analytics involved with Big Data and Data embraced from sources like social media, mobile, and cloud, also attaches an attribute of timeliness to data. This attribute gives Big Data and Analytics a complex character.

Skill gap: It is essential for an organisation to find the appropriate (the one that comprises of both expertise on analytical tools and an understanding of the business flow and data relevancy) Big Data and analytics talent for itself. This talent can become the driver and then the strength of the Analytics dream of the organisation.

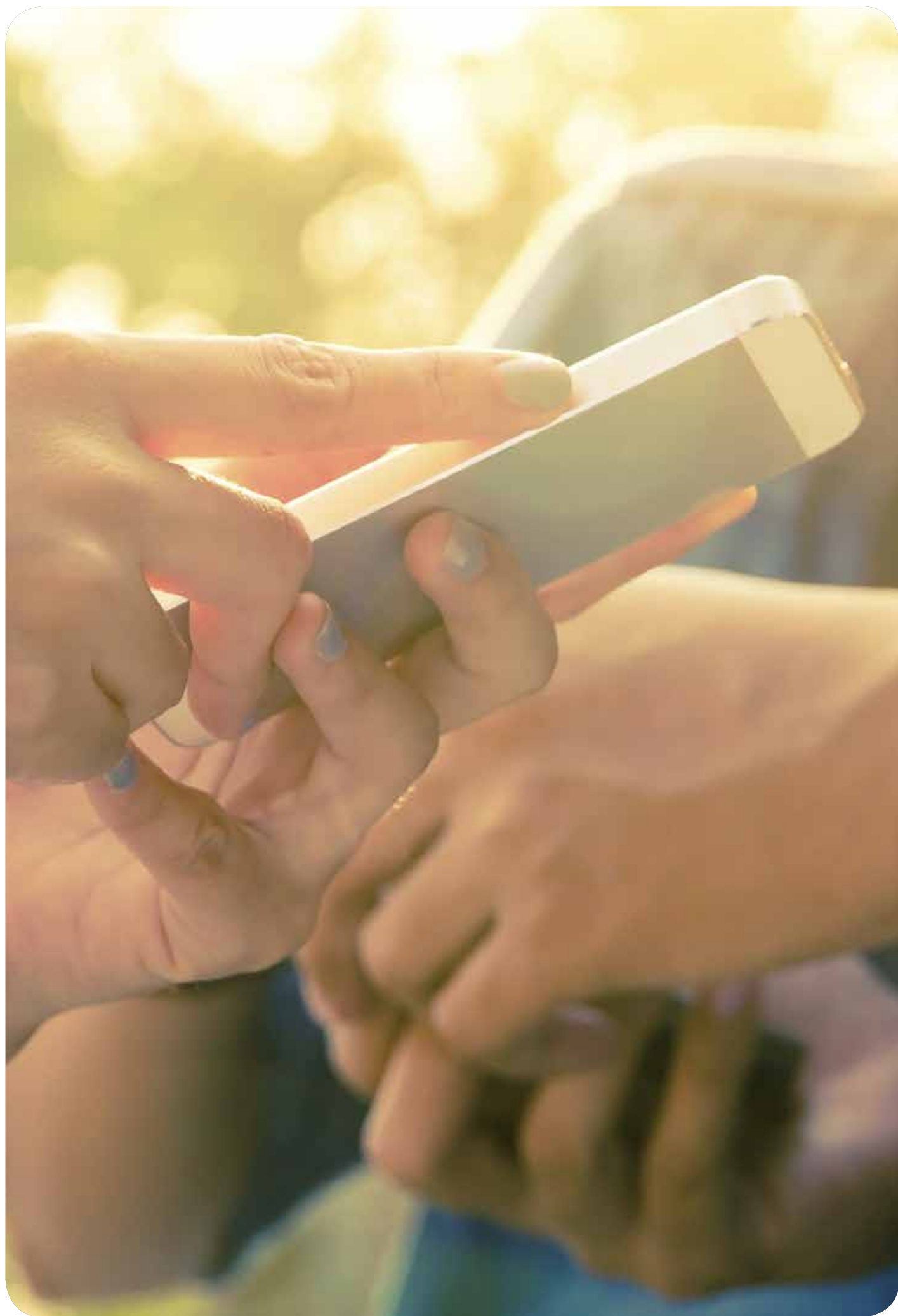
Lack of coordination instead of trust between Business units and the IT department:

Organisations need to be empowered to act on big data and analytics, but at the same time they need to develop relationships between their employees and IT. Employees' point of view towards data should help make the business decision and process easy and also on the veracity of data.

In the current scenario, the value of data at our fingertips is largely underestimated and unexploited, and in almost every sector, including science, health, e-commerce, government, energy, environment, and manufacturing, many applications need to be developed in order to deliver the promise of Big Data.

Using high-performance data mining and management on big data can enable organisations to continuously drive innovation to improve decision making.

It is however imperative to attempt to ensure that there is greater involvement of the Business, and that the CIO focusses equally on adopting the appropriate tools and assuring data quality, security, and privacy.





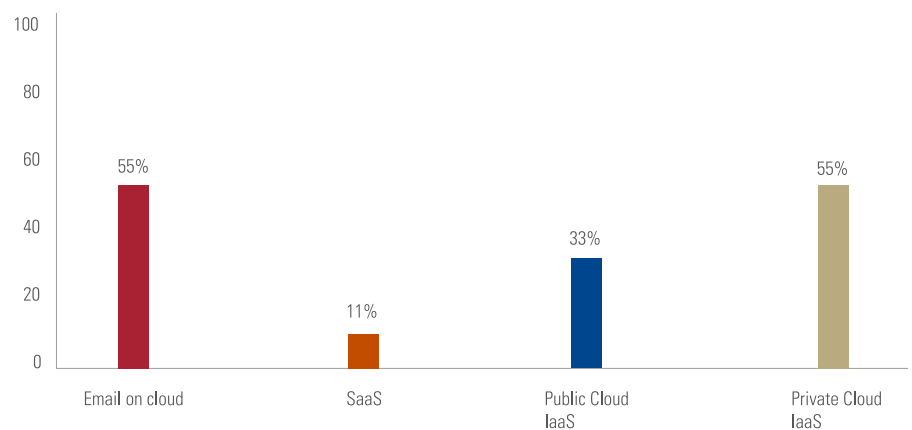
Cloud computing

Cloud is a underlying platform among the SMAC quadruplet. A metaphor for the internet – “Cloud” is a familiar cliché, but when combined with computing, its meaning becomes increasingly important for corporations. The adoption of cloud began with virtualization, but soon Software as a Service (SaaS), Platform as a Service (PaaS), and Infrastructure as a Service (IaaS) transformed the way enterprises set up their IT departments.

Owing to its features like data portability; security and reliability; lower costs and scalability, etc., Cloud services are today an integral part of several IT environments. Cloud computing seems to have made the use of enterprise-grade technology solutions provided by third-party providers more affordable and less onerous.

As per the KPMG in India - Express Computer SMAC Survey, over 55 per cent of the respondents equally use Email on Cloud and Private Cloud Infrastructure as a Service (IaaS), 33 per cent use Public Cloud (PaaS) and 11 per cent use Software as a Service (SaaS).

Types of Cloud Services used by organisations



Source: : KPMG in India - Express Computer SMAC Survey

The public Cloud services market in India is dominant, and it is expected to grow 32.2 per cent in 2014, as per Gartner.⁹ It is expected to touch USD556.8 million in 2014, as compared to a revenue of USD421 million in 2013. Most of the revenue is in the SaaS (Software as a Service) segment, which will total to USD220 million in 2014. The other segments; IaaS (Infrastructure as a

Service) and BPaaS (Business Process as a Service) is expected to contribute USD78 million and USD75 million respectively.⁷

In India, the government is also a major user of the Cloud and it has launched major projects like Aadhar, National Population Register, National Rural Health Mission, IRCTC, etc., making use of the capabilities of Cloud computing.⁸

07. Newsroom, Gartner Website, <http://www.gartner.com/newsroom/id/2721517>

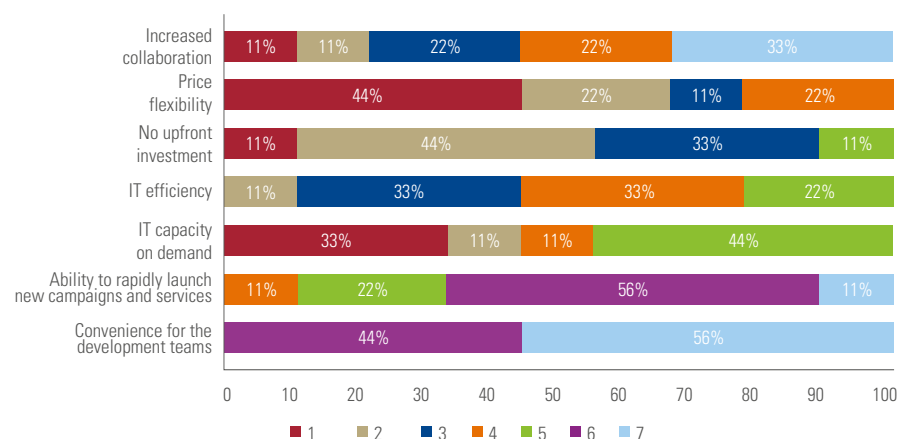
08. "Indian Cloud Revolution", KPMG; <http://www.kpmg.com/DE/de/Documents/Indian-Cloud-Revolution-2012-KPMG.pdf>

09. Newsroom, Gartner Website <http://www.gartner.com/newsroom/id/2721517>

As per the KPMG in India - Express Computer SMAC Survey, 'pricing flexibility' and 'no upfront investment' are considered to be the most important benefits with 'ability to rapidly launch

new campaigns and services' and 'convenience for the development teams' being least important.

Benefits of Cloud Computing for Organisations



Source: : KPMG in India - Express Computer SMAC Survey

Rating by respondents on a scale of one to seven, with one being the most important and seven being the least important.

As we move forward in realizing the capabilities of this disruptive technology, it is important to consider where the world is heading with regards to the Cloud and how organisations can harness it to the best of their ability.

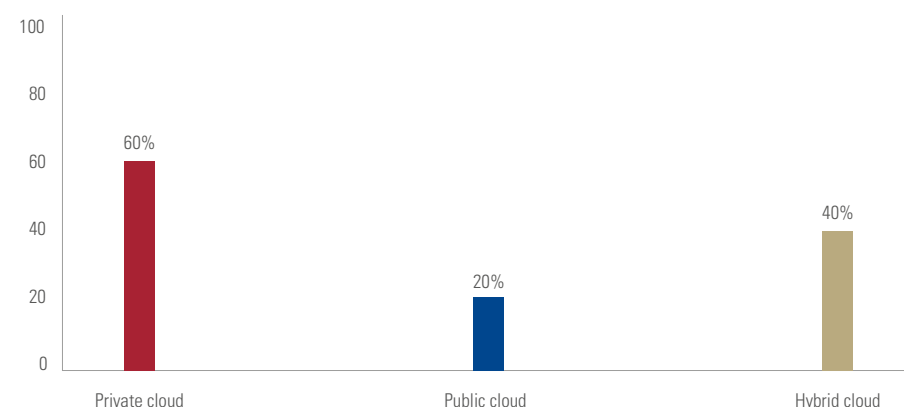
Global trends

A prevalent trend in Cloud Computing currently is the shift of Enterprise IT towards a hybrid model.¹⁰ This is due to the fact that many organisations tend to purchase Cloud services from multiple providers, and implementing a successful Cloud strategy requires a

combination of public and private Clouds. This in turn has given rise to the notion of Hybrid IT, which involves a combination of models consisting of diverse Cloud, as well as non-Cloud services.¹¹

As per the KPMG in India - Express Computer SMAC Survey, 60 per cent of the respondents surveyed are using a Private Cloud Model, 40 per cent of the respondents are using a Hybrid Cloud Model, and 20 per cent of the respondents are using a Public Cloud Model for hosting mission critical applications.

Cloud Deployment Models used



Source: : KPMG in India - Express Computer SMAC Survey

10. Newsroom, Gartner Website, <http://www.gartner.com/newsroom/id/2603623>

11. "Hybrid Cloud Is Driving the Shift From Control to Coordination," Gartner Research; <https://www.gartner.com/doc/2592815?srclid=1-3132930191>

The IT function of the organisation has thus evolved into that of a service broker.¹² It is responsible for service delivery and service levels; although, those services may be carried out by different providers. Hence, the business will likely not be troubled by issues such as which provider to select, the style of computing implemented at the provider, integration with existing IT infrastructure, etc.

Cloud Computing will likely also be affected by advancements in other technologies such as Internet of Things. Gartner estimates 26 billion connected devices by 2020. Hence, we can expect a huge amount of data to be generated by devices such as sensors, medical devices, transportation devices, wearable computing devices, etc. An easy way for organisations to store and analyse this data is to use public Cloud.¹³

But one concern which could hamper the growth of Cloud computing is the fact that there are around 160 standards¹⁴ which govern Cloud computing systems, each one distinct to a particular Cloud service provider. Hence, the focus needs to be on developing a common open standard which can be used by all organisations.

Another trend which organisations need to keep track is the increasing importance of the personal Cloud. Gartner predicts that increasing reliance on the personal Cloud will cause a shift from devices to services.¹⁵

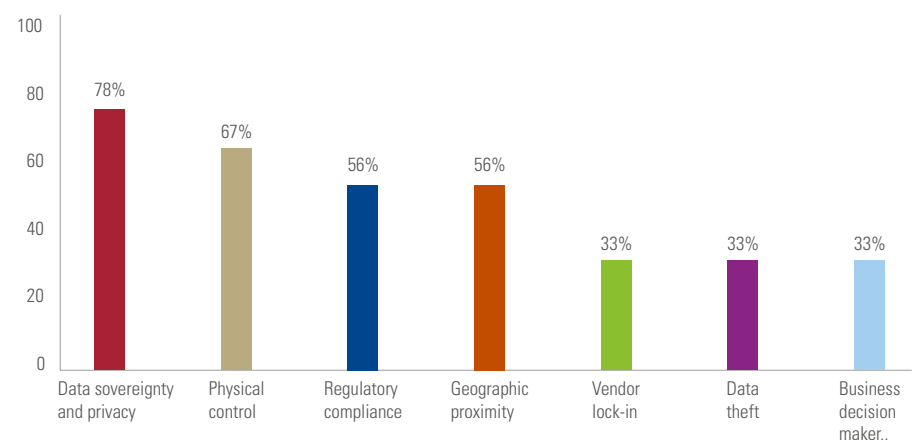
Device specifications may not be as important as they are now, because a transaction will likely be done via the Cloud. However, it also means that organisations may have to implement specific policies in order to monitor the use of personal Clouds by employees in the enterprise, and security aspects such as Data Leakage Prevention (DLP), Security Incident, and Event Monitoring (SIEM) shall need to mature to include enterprise and personal Clouds.

Challenges

As with every new technology, the challenges faced by it tend to increase as it becomes more popular. Cloud Computing is no different. Before adopting a Cloud strategy, organisations should have clear idea of what they want to achieve and which strategies they are going to implement. They should also consider what changes they may need to make in the organisation to adapt to the new technology.¹⁶

As per the KPMG in India - Express Computer SMAC Survey, over 77 per cent of the respondents considered Data Sovereignty and Privacy to be a major barrier to the adoption of Cloud. Other major barriers include Physical Control, Regulatory Compliance, and Geographic Proximity.

Major barriers to the adoption of Cloud



Source: : KPMG in India - Express Computer SMAC Survey

12. Newsroom, Gartner Website, <http://www.gartner.com/newsroom/id/2603623>

13. Opinion, Forrester Website, http://blogs.forrester.com/james_staten/13-12-04-Cloud_computing_predictions_for_2014_Cloud_joins_the_formal_it_portfolio

14. "Standardizing the Cloud: A Call to Action", Booz & Co. ; http://www.strategyand.pwc.com/media/uploads/Strategyand_Standardizing-the-Cloud.pdf

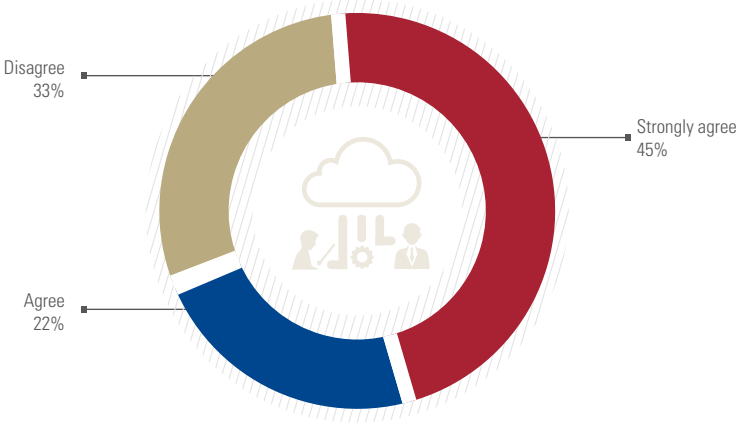
15. Newsroom, Gartner Website, <http://www.gartner.com/newsroom/id/2603623>

16. Research, Gartner, <http://www.gartner.com/technology/topics/Cloud-computing.jsp>

As per the KPMG in India - Express Computer SMAC Survey, over 45 per cent of the respondents strongly agree and 22 per cent agree that data security

concerns are holding back adoption of Cloud technologies, and 33 per cent are concerned about data security.

Is Data Security concerns holding back adoption of the cloud

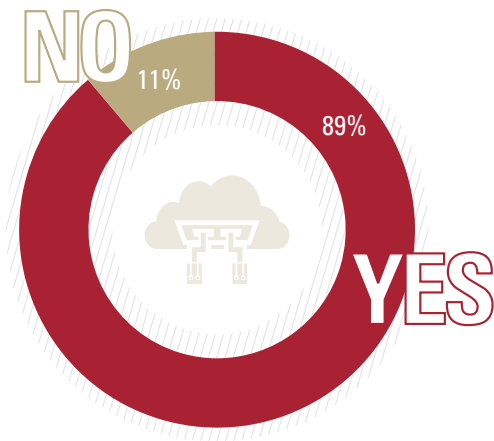


Source: : KPMG in India - Express Computer SMAC Survey

As per the KPMG in India - Express Computer SMAC Survey, 89 per cent of the respondents have a governance, compliance, and security

policy or framework outlined for Cloud Computing initiatives, and 11 per cent of the respondents do not have such a framework in place.

Organisations having a Governance, Compliance, and Security Policy or Framework for cloud computing initiatives



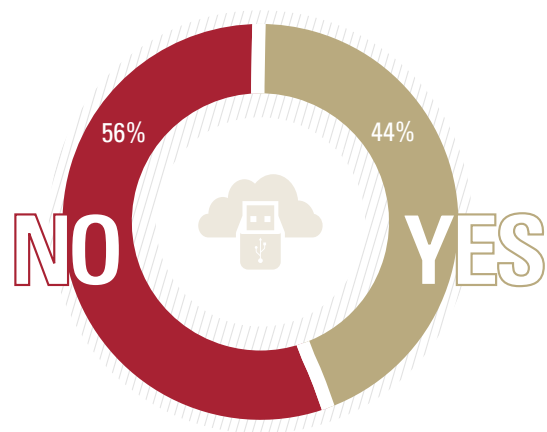
Source: : KPMG in India - Express Computer SMAC Survey

Many organisations are reluctant to trust their data to a third-party provider and need assurance that it is secure. They must also determine the appropriate recovery and manageability in their organisation.¹⁷ Furthermore, the organisation’s security policy must be updated to take the Cloud into consideration.

As per the KPMG in India - Express Computer SMAC Survey conducted by KPMG in India, over 44 per cent of the respondents are concerned that the Cloud service may not adhere to their established governance framework, including data security controls.

17. Research, Gartner, <http://www.gartner.com/technology/topics/Cloud-computing.jsp>

Organisations concerned about the Cloud Service Provider (CSP) adhering to their established governance framework including data security controls

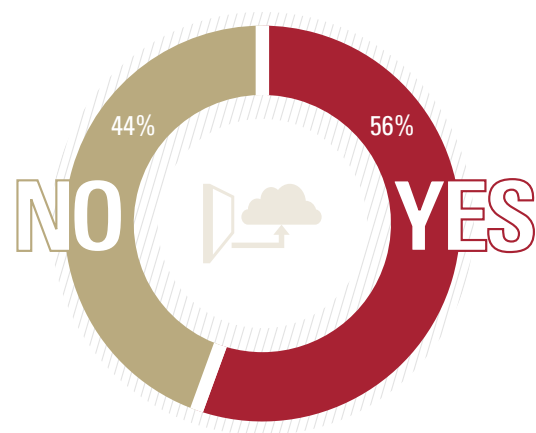


Source: : KPMG in India - Express Computer SMAC Survey

One way in which organisations can ease their concerns with regards to Cloud service providers adhering to their governance and security frameworks is if the provider undergoes regular third-party assessments for compliance to contractual clauses, industry standards and service level commitments. As per

the KPMG in India - Express Computer SMAC Survey, over 56 per cent of the respondents agree that their Cloud service provider undergoes regular third-party audits, whereas 44 per cent respondents say that their providers do not undergo regular audits.

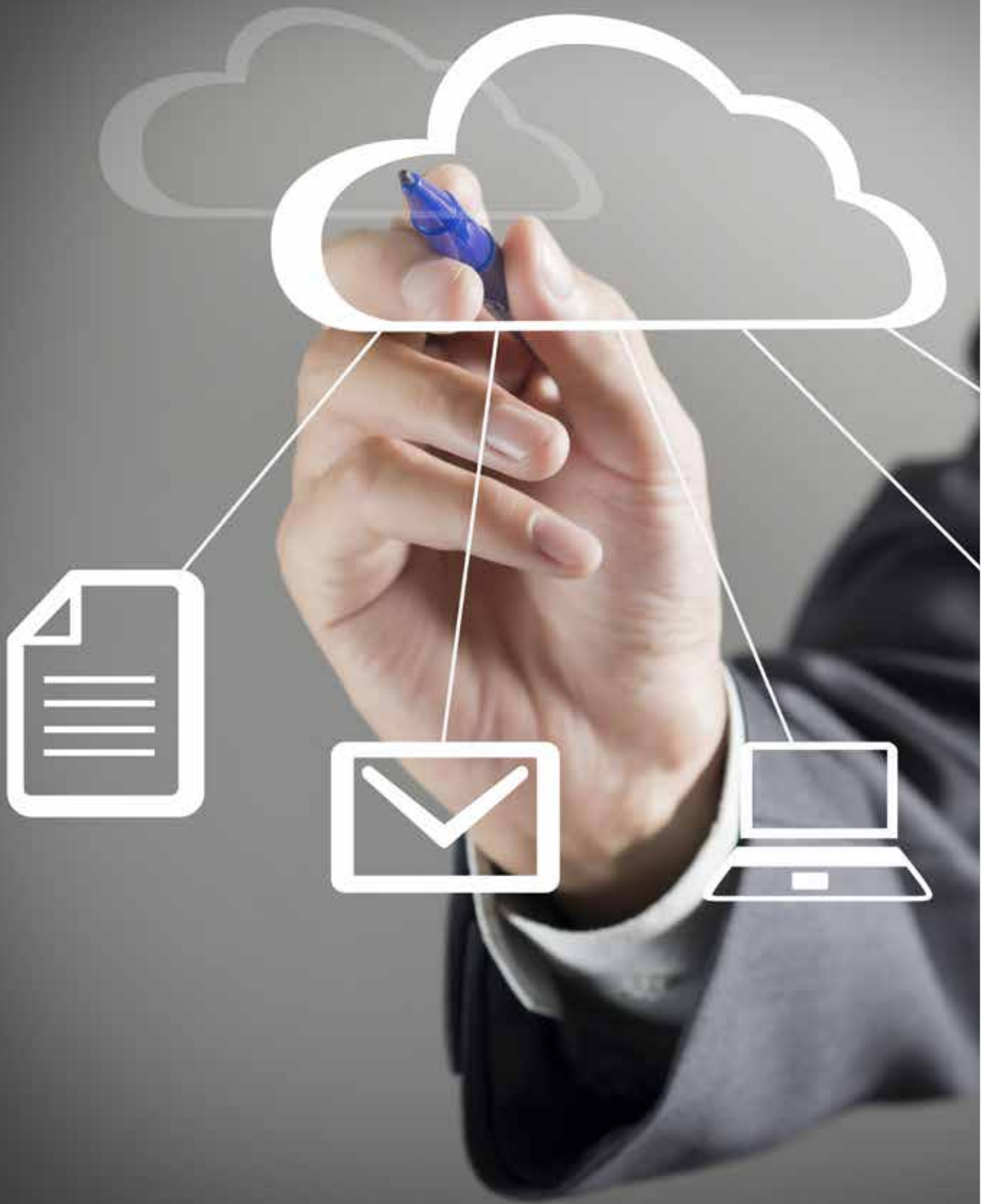
Response to regular third-party audits to help ensure compliance with organisations’ established governance frameworks



Source: : KPMG in India - Express Computer SMAC Survey

Many of the big players in the IT industry have introduced some form of Cloud offering and steps are being taken to develop open standards for Cloud services. For the CIO, the focus now

needs to shift from catalyzing adoption to helping ensure the appropriate governance throughout the adoption lifecycle of the Cloud Service Provider.





Conclusion

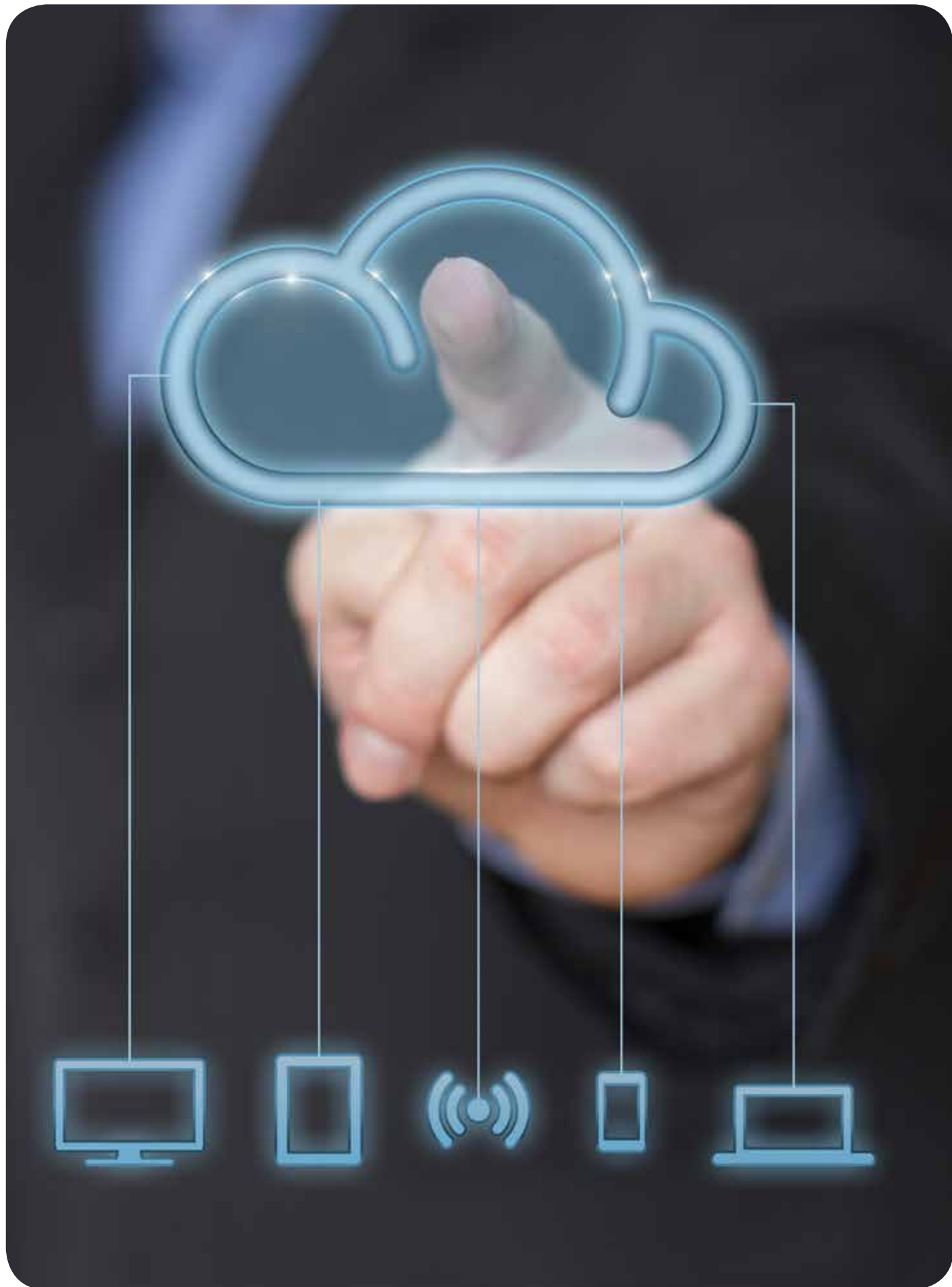
As enterprises become more committed to seek insights through the information they gather by exploiting the four pillars of SMAC; adoption of SMAC collaboratively rather than separately may have better impact on organisations.

But the adoption of these four is likely only the first step in the right direction. The expected success may come only once the organisation is able to structure a collaboration of these four pillars. This is where an organisation may be required to leverage its strengths and implement SMAC in its envelope to get the edge in the market. Organisations need to gather data and then access information at the appropriate time through collaboration of these four technologies. This information helps the enterprise bring innovation to the industry and transform the customers' or users' experience, what we hear as 'UX' today. Consumer delight requires exemplary implementation as well as meeting the hygiene factors of customer data security and privacy. The evolving innovation industry has always presented upgrades to existing technologies and SMAC may be no exception.

As enterprises globally adopt new technology formats for operational efficiency, cost reduction, extend the current reach, and gain business edge, they need to assess the impact of the investment as well as consider their own strengths and weaknesses with respect to how this paradigm shift may affect the overall organisation's culture.

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