Intersection of Innovations

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Gone are the days when the business simply 'RESPONDED' to customer needs. Welcome to the current age where businesses 'PREDICT' customer needs and proactively 'PRESCRIBE' solutions before the help is sought! The key to this proactive approach is a deep understanding of the customer, his taste, preferences, his social needs and contacts, leveraging this knowledge to glean valuable customer insights and translating these insights into customer service refinements.

The Intersection of the major disruptive innovations Social, Mobile, Analytics (Big data) and Cloud, SMAC as they are called, provides an amazing potential which, if effectively managed and utilized, by a business could be a key business differentiator, enabling the business to provide an elevated personalized customer service.

This Article is an examination of the collaboration and convergence of the Social, Mobile, Analytics and Cloud innovations and how their intersection opens up diverse avenues for businesses to better serve the customer. It also focuses on various interrelated elements of an Enterprise and the enabling IT must consider while specifying their SMAC strategies, to effectively manage this intersection and to provide superior customer service.

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Introduction

Case 1

Your aircraft was DELAYED. You landed late in the evening and you've lost your hotel reservation. You're in Cairo, a place you've never been before. A new place, a an unfamiliar language, not a soul in sight and no room for the night. Suddenly, your mobile buzzes and a message pops up from the Hilton, welcoming you to Cairo, announcing you as their preferred customer and surprising you with a marvelous offer for stay at their recently opened hotel suite nearby. You joyously accept their offer.

But wait, how on earth did these Hiltoners know that I am in Cairo?

Case 2

You're outside enjoying a bright sunny morning. You see someone dressed in a beautiful floral print, and you tweet a description to a friend. Suddenly your mobile comes alive and you see a pop up from the nearby retail outlet asking you to e-try a similar floral print. It asks that you upload your photo, and a minute later you see yourself on the mobile dressed in the beautiful floral print. You like what you see, go to the outlet and make the purchase, you are a happy customer.

But hold on, you have a question for the retailers. How on earth did they know that you were near and that you wanted a wear?

Let's explore how the intersection of the major disruptive innovations, Social, Mobile, Analytics (Big Data) and Cloud toil to make customers the KING!

Customer is the KING!

The advent of disruptive innovations is setting high customer expectations. The market has become very competitive, and it is no longer sufficient to simply perform your core business reliably well. Customers have grown accustomed to being pampered and sought after. They demand the extra MILE and do not mind going the extra mile of a switchover if their expectations are not met. A short time ago it was sufficient for business to RESPOND to customer's needs, but now the business must PREDICT customer needs, and proactively PRESCRIBE solutions before help is sought. The key to a proactive approach lies in understanding the customer, his tastes and preferences, social contacts and needs and leveraging this knowledge to anticipate and fulfill his needs before he 'ACTUALLY' seeks fulfillment.

Social, Mobile, Analytics (Big data) and Cloud, SMAC as they are called, are disruptive innovations that are gaining adoption by majority of businesses. The intersection of these innovations, provides an extraordinary potential which, if effectively managed and utilized, could be a key business differentiator, providing the business valuable insights into the customer.

So what is a 'Disruptive Innovation'?

According to Wikipedia, "A disruptive innovation is an innovation that helps create a new market and value network, and eventually goes on to disrupt an existing market and value network (over a few years or decades), displacing an earlier technology. The term is used in business and technology literature to describe innovations that

improve a product or service in ways that the market does not expect, typically first by designing for a different set of consumers in a new market and later by lowering prices in the existing market."

We will examine the effect of the nexus of the four major disruptive innovations Social, Mobile, Analytics (Big Data) and Cloud and observe how their intersection forms a closed loop feedback mechanism, enabling the business to proactively anticipate and address the needs of a customer and hence provide a superior customer experience.

Innovations in Action

Social, Mobile, Analytics (Big Data) and Cloud do not operate in vacuum. They work in tandem to provide amazing results. (See Figure 1.) A typical end - end business service cycle has the following phases:

- Discovery — Identification of potential target customer groups
- Interaction — Marketing and promotions to enhance the business sale possibility
- Transaction — Enablement of the sale
- Register & Refine — Sale feedback capture and analysis for service refinement

With innovations in action, in the current age, Social Computing aids discovering potential customers and tracking existing customers on Social networks. Analytics (BIG Data) determine the customer context, thus making it possible to provide personalized marketing campaigns, while Mobile enables constant connectivity with the customer creating the opportunity to convert a potential sale to a completed one. The Cloud acts as the Delivery platform for all of these and guarantees availability, flexibility and agility.

Social

'Man is a social animal.'

The social networks that have sprung up recently have made keeping in contact simple. People connect with other people and exchange all sorts of information which is a goldmine of data, and, if mined properly, would give a lot of information about their taste, preferences, and social needs. Lots of opinions on various products are expressed and have an influence on potential customers.

For business, discovering and identifying their customers and tracking them on various social networks provides valuable insights which promote enhanced customer engagements and relationships. The social networks also provide marketing arena for the business to attract potential customers with personalized and context specific business offers.
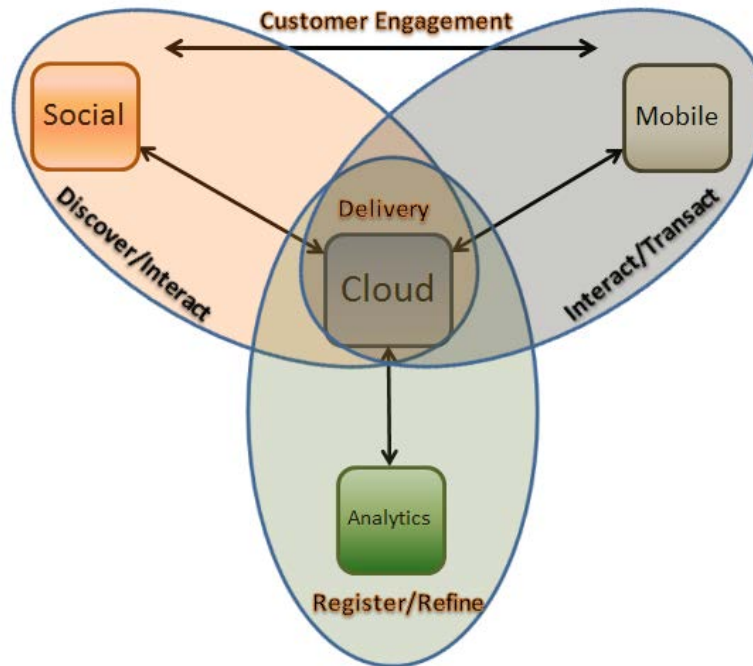
Figure 1.

Mobile

'Ubiquitous Connectivity is the call of the day'

People want to be connected everywhere all time. Mobiles make this possible and are soon becoming the preferred channel for doing business. With a large number of smartphones in use and loaded with a plethora of sensors, individuals are constantly streaming loads of information which, if mine effectively, can be used for a business's benefit.

People often get their work done during idle moments, such as waiting for the train, being stuck in traffic, etc. Smart businesses are engaging customers in their idle moments and luring them with customer-specific offers and enabling them ers to make good use of their down time.

For business, using the mobile platform, coupled with the location based services, provides the customer with a an amazing user experience that helps win more business.

Analytics (Big Data)

'The most important V of Big Data – VALUE'

Big Data is everywhere, be it in the streaming of information from sensors on mobiles, logs from the machines, tweets on the social network and the wide variety of emails and other data rich text on the companies' networks. As we know Big Data comes with three Vs, Volume, Velocity and Variety. However there is a fourth important parameter which is the 'Value' of the data. Big Data, by itself, has NO value, unless it is analyzed and mined for meaningful insights that add value to the

business. When Big Data is married with the Business Analytics Value to the business occurs.

The integration of BIG DATA on the Social network, BIG DATA on the Mobile and BIG DATA from the Enterprise on a real time basis provides the business with a holistic view of the customer and accelerates the transition from descriptive and predictive analysis to PRESCRIPTIVE analysis which enables refined, context based customer service.

Cloud

'Business Agility and flexibility drives profitability'

A path breaking delivery model for IT, Cloud offers the business, agility and flexibility to meet its changing demands at a quicker rate than previously available. A major segment of the business community has adopted or is in the process of adopting Cloud computing. Many customers unwilling to take what they see as a risk on the public cloud are willing to consider the private cloud or even the hybrid model of the public with the private clouds.

The Cloud offers the enterprise a flexible, elastic, strong delivery vehicle for the other three major innovations. Further, it provides access to global connectivity which, in turn, helps the business to provide improved customer service.

Closed Loop Feedback – Business Service Cycle

Cases 1 and 2 are typical scenarios where we observe the intersection of innovations in action, in which a business is able to predict a customer's needs his needs before he actually realizes them and proactively offering an attractive opportunity.

In the two cases cited above, there is an invisible closed loop feedback mechanism in operation among Social, Mobile, Analytics (Big Data) and Cloud Computing elements, with the customer unconsciously driving it from the center.

The SOCIAL force in play identifies the contacts, friends and needs on your social network and MOBILE force in play helps to track your geographical position.

The CLOUD is the force, the platform on which all these other forces possibly run and the ANALYTICS makes the inference, from the BIG DATA that other forces generate, that you are in the proximity. This provides the business with this insight.

The business then

Figure 2

Case 1:
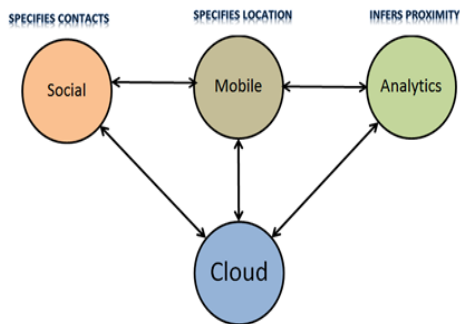
Case 2:
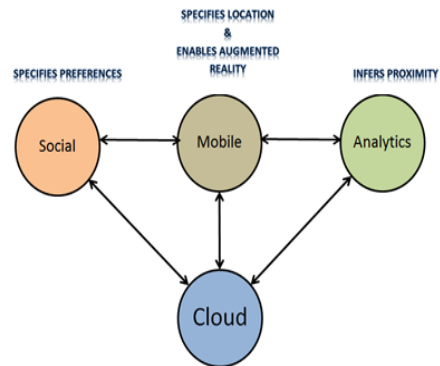
Figure 3

Intersection of Innovations

We observed earlier how the innovations, in a business service cycle, open up diverse channels for the business to discover, interact and transact with customers and deliver a superior customer service. Let's examine the effect of each of these innovations, Social, Mobile, Analytics and Cloud (SMAC) in light of the other three major innovations, and then jointly as an intersection of all four of them. Then we'll examine the various inter-relational dependencies between these innovations-- dependencies the Enterprise should to consider and optimize as they develop their SMAC strategies for effective use this intersection.

Intersection: Cloud - Social
➤ New Cloud Model – SOCIAL CLOUD
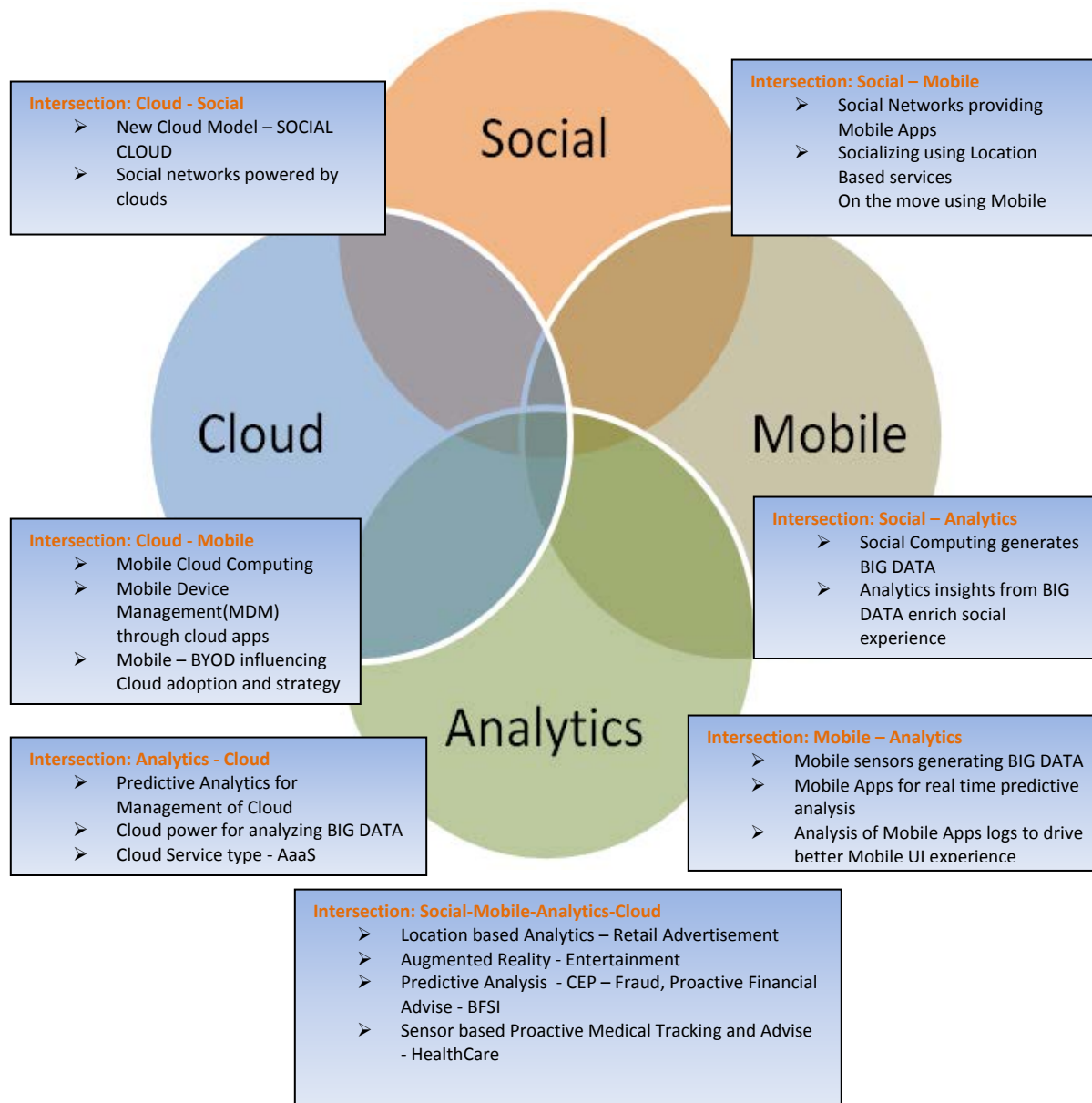➤ Social networks powered by clouds

Intersection: Social – Mobile
➤ Social Networks providing Mobile Apps
➤ Socializing using Location Based services
On the move using Mobile

Intersection: Cloud - Mobile
➤ Mobile Cloud Computing
➤ Mobile Device Management(MDM) through cloud apps
➤ Mobile – BYOD influencing Cloud adoption and strategy

Intersection: Social – Analytics
➤ Social Computing generates BIG DATA
➤ Analytics insights from BIG DATA enrich social experience

Intersection: Analytics - Cloud
➤ Predictive Analytics for Management of Cloud
➤ Cloud power for analyzing BIG DATA
➤ Cloud Service type - AaaS

Intersection: Mobile – Analytics
➤ Mobile sensors generating BIG DATA
➤ Mobile Apps for real time predictive analysis
➤ Analysis of Mobile Apps logs to drive better Mobile UI experience

Intersection: Social-Mobile-Analytics-Cloud
➤ Location based Analytics – Retail Advertisement
➤ Augmented Reality - Entertainment
➤ Predictive Analysis - CEP – Fraud, Proactive Financial Advise - BFSI
➤ Sensor based Proactive Medical Tracking and Advise - HealthCare

Figure 4.

Social Computing

In a business service cycle with SMAC in action, Social Computing enables discovery and interaction. They also act as a marketing arena for targeted campaigns promoting products or services they know to be attractive the customer.

a. Enabling discovery on Social Networks – Identifying target groups

Social networks like LinkedIn and Facebook, are a big storehouse of valuable demographic and psychographic information about potential and existing customers. The social data from these networks can be analyzed to understand people's preferences and identify target groups of potential customers. Personalized and targeted campaigns can then be mounted to secure them as customers.

b. Tracking the Customer Preferences

Customers can be tracked on the social networks to better understand their changing social needs and preferences. To enable the tracking of a customer on a Social network, the social ID or the Social logon of the customer on Social networks could to be captured by the business. This procedure needs to be reflected in the Social strategy of the Enterprise and would need to be captured as soon as the customer is registered. The user interface, including the Mobile UI, which capture the customer's details need to be amended to include this.

Once the customer has been identified on the Social network, then the social data pertaining to the customer needs to be integrated into the Enterprise Data to provide a more holistic view. Fortunately Social Networks provide APIs which give business access to the data on these networks. The integration of the Social data into the BIG DATA portfolio needs to be reflected in the Analytics strategy of the enterprise. Also the strategy needs to specify the extent and nature of the relevant data that needs to be gathered.

Enabling targeted campaigns on the Social networks

The results of the analysis from the Social Data integrated with the mobile and enterprise data can be used to drive marketing campaigns on the Social networks. These campaigns can be run using external cloud based marketing apps and thus strategic partnerships with these cloud vendors and the cloud models they support need to be considered and reflected in the Cloud strategy of the enterprise.

SMAC INTERSECTION Considerations for SOCIAL COMPUTING	
ANALYTICS and BIG DATA	Storage and Integration of the BIG DATA provided by the Social Networks
	Analysis of the Social BIG DATA to determine various pyschographic and demographic customer insights
	Avoid Privacy issues by honing on intent of customer and NOT by spying
MOBILE	Mobile UI enhancements for Social Id Logon capture and facilitation
	Cross channel optimization to track customer across various channels
CLOUD	Social Marketing enabled through external Cloud based marketing solutions

Figure 5.

Mobile Computing

In a business service cycle with SMAC in action, Mobile Computing enables interaction and transaction. It provides ubiquitous connectivity – an ability to enable business on the move. Mobile Big Data helps to build context information for a

potential sale, using Location based services. Mobile Platform also act as a marketing arena, where targeted campaigns can be set up and customers can be led to potential appealing business offers.

a. Enabling Ubiquitous Connectivity and a sound transaction platform

Mobile provides the user the ability to be connected anytime and all time. With mobile apps empowering the user to transact even on the move, customers are using their IDLE time to get their work DONE and DO business. To enhance sale possibilities, the business should invest in providing superior customer friendly, disruption less, and engaging user experiences for their customers through their mobile apps. Usually people browse a considerable amount on mobiles and smart devices, and when search results lead them to a page, where the experience is unrewarding, they tend not to re-visit the site for a significant length of time. To appeal to the impatient user, businesses need to focus considerable energy on the Mobile UI experience.

b. Location Based Services

Geo-fencing through mobiles using GPS and RFID provides location information, which can be used to identify a customer's location and lure them with attractive location-specific offers.

c. Marketing ground – Augmented Reality

Like Social Networks, mobile can also be used as a marketing ground using SMS and other marketing strategies. In fact with the Mobile, marketing can be taken to a higher plane using augmented reality using the various sensors in the mobile to capture a customer's attention and lead him to a sale.

SMAC INTERSECTION Considerations for MOBILE COMPUTING	
ANALYTICS and BIG DATA	Storage and Integration of the BIG DATA provided by the Mobile sensors, Mobile app logs
	Analysis of Mobile BIG DATA for insights on Mobile user experience per se crashes, error reports- Improving Mobile UI for customer engagement
SOCIAL	Social Data can be analysed for customer preferences to personalise UI experience on Mobile
	Cross channel optimization to track customer across various channels
CLOUD	Cloud Deployment of Mobile Apps for service availability and guarantee – Mobile cloud computing
	Usage of Cloud apps like Drop box and Fileshare by the Mobile Apps

Figure 6.

Analytics and BIG DATA

In a business service cycle with SMAC in action, Big Data and Analytics enable storage and analysis of the streams of information available across the Social, Mobile, Cloud and the Enterprise networks and translation of the V's--namely Volume, Velocity and Variety of the BIG DATA into 'Value', the W's, namely What, When, Why, Who, Where, which matter to the enterprise. Analytics is the 'BRAIN' in operation which drives the whole business service cycle. The trend of the day is not

just the move from the 'Descriptive' to 'Predictive' analysis but a jump to a "PRESCREPTIVE' analysis which not only predicts but also suggests potential solutions to business issues.

Thus, it is the marriage of BIG DATA with Business Intelligence or Analytics that provides the business with a competitive edge.

a. Storage of Big DATA

Businesses are moving towards the concept of the extended enterprise where the data pertaining to an enterprise is NOT just confined within the enterprise but reaches into the SOCIAL networks, MOBILE networks and the CLOUD. All of this BIG DATA, when effectively mined, could contribute valuable insights which could significantly improve business outcomes.

But this BIG DATA needs to be identified and stored in a medium that will enable ps further analysis of it. Also, the BIG DATA from a variety of sources like Social, Mobile, which could be unstructured, could be integrated with the structured data inside the enterprise to derive a holistic view of the customer, leading to improved service.

b. Context Determination — Identification of potential sales opportunities

Once BIG DATA is available and integrated from across the variety of sources, whether within the enterprise or In the Internet of Things, analysis of it will yield useful insights. Context Determination to influence sales is an important process that can help to significantly increase business.

c. Descriptive → Predictive → Prescriptive analytics (Register and Refine)

Initially, it was the world of descriptive analysis, where analysts would look at past data and, using deductive reasoning, would draw conclusions about why things happened the way they did. The next move was to the age of 'Predictive Analysis', wherein, based on past data, analysts identified trends, and based on certain factors, predicted what would happen. Now we are in the age of 'PRESCRIPTIVE' analysis, where not only the future problems are predicted, but effective solutions are prescribed using analytics.

SMAC INTERSECTION Considerations for ANALYTICS COMPUTING	
MOBILE	Mobile Apps for presenting Realtime Predictive Analysis
	Mobile BIG DATA like sensor/location data and App logs serves as an input for Analytics
SOCIAL	Social BIG DATA serves as an input for Analytics
CLOUD	Cloud Storage for Big Data (IaaS)
	Cloud Computing Platform for the BIG Data Analysis (Paas)
	Cloud Based Analytic Solutions for BI(Saas)
	New Cloud Service Type - Analytics as a Service(AaaS)

Figure 7.

Cloud Computing

In a business service cycle with SMAC in action, Cloud forms the underlying delivery vehicle powering the other forces in action, guaranteeing high availability and enabling business flexibility and agility. Cloud Computing aids the business service cycle in the following ways:

a. Provision of a sound delivery platform for Enterprise applications and infrastructure

Cloud adoption in an Enterprise can be public, private or hybrid. In the public model, the business hosts its proprietary solutions on a public cloud in an off-premise model. If security is a concern, then a private cloud, which is on-premise, can be used. But in many scenarios a hybrid cloud, which is a combination of public and private clouds can be used, where sensitive information is preserved securely on a private cloud and other information is stored in a public cloud. Varied cloud service types as indicated below can be adopted by an Enterprise to accommodate their Social, Mobile and Analytics needs.

- **Infrastructure as a Service- IaaS** Used in the IaaS model, Cloud acts in the infrastructure space and helps provide storage and to compute power for SOCIAL, MOBILE and ANALYTIC computing
- **Platform as a Service-Paas- Used** in the PaaS model, Cloud acts in the platform layer and provides the technology platform to enable Mobile and Analytics development and deployment.
- **Software as a Service-Saas- Used** in the SaaS model, Cloud acts in the software layer, and Mobile and Analytic applications can be deployed in the cloud using the concept of Mobile Cloud Computing and Analytics as a Service, respectively.

b. Usage of External Cloud Solutions by the Enterprise
Various cloud based applications, from external vendors, for Analytics, Mobile and Social purposes can be utilized by the Enterprise for business purposes.

SMAC INTERSECTION Considerations for CLOUD COMPUTING	
MOBILE	Mobile Apps Deployment and Mobile BYOD has a significant impact on the Cloud Stategy to be adopted for the Enterprise
SOCIAL	Social Media sharing has a significant influence on the Cloud strategy
	Social - Cloud is a new concept being touted where the social contacts provide the cloud resources for computing - A new disruptive innovation to look for
ANALYTICS	Predictive Management of Cloud analysing Big Data generated from various machine logs ,VMs and other machine data on the networks
	Big Data and Analytics technologies influence the Cloud Strategy of an Enterprise

Figure 8.

Conclusion

We have seen how the intersection of innovations holds terrific potential and opens up a very interesting and proactive way of interacting with customers and providing them with a fantastic experience. The real challenge of the business and IT is to

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change its approach from reactive to proactive. To do so requires an investment in building business strategies, infrastructure, technology and resources to fully develop this potential to gain that 'LEADING EDGE' and use this intersection effectively, translating it to a key business differentiator in providing superior customer service.

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Various Blogs and comments in the internet by various authors on Innovations

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