TELECOM BUSINESS REVIEW

A Journal of Symbiosis Institute of Telecom Management

ISSN: 0973-9114

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Editorial Message

It gives me great pleasure in presenting to you the sixth issue of Telecom Business Review (TBR). The TBR has been a platform for scholars, teachers, professionals, and students to contribute and showcase their knowledge, experience, study results and findings in the relevant areas of Technology and Business Management. In the 2012 issue, we published articles on diverse topics such as Data age in telecom, Waterfall Model, Business Intelligence, Cloud SLA's and business models, IFRS etc.

I am sure this year's issue of the TBR too will help to trigger quality studies in the field of telecom business management and enlighten and educate the telecom fraternity.

At the release of the sixth issue, I thank all the contributors for their thought provoking articles. I also express my heartfelt gratitude to the members of the editorial board and all our esteemed reviewers. I also seek the support of the telecom fraternity in our efforts of making the TBR global by contributing research papers that highlight global issues in telecom business.

Sunil Patil.
Director, SITM

Telecom Business Review

Volume 6 Issue 1 September 2013

ISSN: 0973-9114

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Journal is available online at www.publishingindia.com

Challenges in Outsourcing of Telecom Tower Management–System Integrators (SI) Perspective

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Abstract

The phenomenal growth in mobile subscribers over the last few years has created huge opportunities for the telecom infrastructure industry. The operators in developed markets have already moved on to advanced active infrastructure outsourcing, operators in developing markets are beginning to realize the potential of passive infrastructure outsourcing. The intense competition in the telecom industry forced all the operators to look for opportunities to reduce the cost of operations by outsourcing tower infrastructure management related activities which demand huge capital expenditure and operating expenditure. Thus the telecom tower industry is growing continuously to cut down cost and reducing the time-to-market.

There are number of challenges and risks for incumbents and greenfield telecom operators in this working model. Today a telecom operator has outsourced various core and non-core functions and processes to multiple vendors which pose a major challenge for all the SI's to work together in a harmony to deliver end to end SLAs and quality service to the client. Though outsourcing tower component of the network to an SI seems to be a beneficial aspect for the operators, the tower outsourcing is a comparatively new concept in the telecommunication industry in India. The research presented in this paper primarily explores the tower management outsourcing challenges faced by system integrators (SI's) and actionable recommendations. Paper presents an extensive literature survey based on which select critical factors have been identified for creating a framework that could be used by telecom operators and SI's for successful implementation.

Keywords: System Integrators, Tower Management, Outsourcing, Framework

1. Introduction

Network infrastructure outsourcing is finding strong acceptance with mobile operators around the world. While operators in the developed markets of Western Europe have already moved on to advanced active infrastructure outsourcing, operators in developing markets are beginning to realize the potential of passive infrastructure outsourcing. Consequently mobile tower outsourcing is gaining increasing acceptance across these markets as an effective way to cut down costs, while reducing the time-to-market. These initiatives have already seen significant traction in India, and are poised to make their impact felt in the Middle East and Africa (MEA).

Mobile tower outsourcing offers significant potential for cost savings for both incumbents and new entrants. At the same time, outsourcing is accompanied by risks such as reduction in strategic control and potential for information leaks. Regulators face the challenge of ensuring a level playing ground for all operators with no threat of cartels. Our analysis presents specific approaches to tower outsourcing for incumbents and new entrants and challenges faced by system integrators.

The research presented in this paper primarily explores the tower management outsourcing challenges faced by system integrators (SI's) and actionable recommendations. Paper presents an extensive literature survey based on which select critical factors have been identified for creating a framework that could be used by telecom operators and SI's for successful implementation.

2. Literature Review

Outsourcing has become an important strategic decision with considerable growth in recent years. The number of publications dedicated to overall outsourcing has increased in recent years; encouraging deep-dive further on this concept.

The literature review is the secondary data used for this research. The focus of our study on articles preferably published in journals and does not include sources such as published books or papers presented in conferences; this is based on the belief that practitioners and academics prefer journals to obtain disseminate new knowledge.

Jennings (1997) talks about the factors which are important from strategy point of view for any outsourcing work. The factors like Business Environment, Capability, Cost, Supplier Relationships and Technology. It examines potentially complex decisions associated with both the development of strategic advantage and the loss of strategic capability in outsourcing contracts. It also discusses many perspectives that have been proposed for evaluating the outsourcing decision such as competitive advantage, environmental change, cost, capability, as well as essential relationships retention and development, technological choice and the monitoring and revision of sourcing decisions. Outsourcing can leverage other strategic benefits apart from cost i.e. improved quality, focus, flexibility, etc.

Mclvor (2000) detailed out the experience of TEM ("Telequip") and its key suppliers on the practical lessons learned about strategic outsourcing. Fjermestad and Saitta (2005) have proposed framework for managing IT outsourcing engagements considering factors like: IT alignment, Contracts, infrastructure and Technology, culture, Strategic partnerships, management support, governance and economies. Hillman (2008) talks about the outsourcing of the NOC as beneficial consideration by Service Providers in today's accelerated technological changing environment due to phenomenal IT and Telecom sector consolidation.

Cronk and Sharp (1995) talk about the theoretical development of outsourcing of IS functions which is a critical and pervasive contemporary phenomenon. Firm's outsourcing strategy can be determined by synthesizing four theoretical models namely resource-based, resource-dependent, transaction cost and agency theory model. Jurison (2005) views IT outsourcing as a classical make-or-buy decisions consisting of examining an acceptable balance between risks and benefits. The principal development model discussed in this paper is the relationship between outsourcing risks and benefits. This model can assist management decision in determining; outsourcing or in-sourcing choice for a particular function as well as comparing and evaluating competing vendor proposals. Lacity, Willcocks and Feeny (1996) presented an analysis on the failure points of the IT outsourcing to produce the expected cost savings or non-financial benefits. The paper outcome is selective outsourcing frameworks to clarify sourcing options and aid managers in deciding which IT functions to contract out and which to retain in-house. Thus, selective sourcing meets customer's needs while minimizing the risks associated with total outsourcing approaches.

Idachaba (2010) reviews the operational cost structure of mobile telecom operators and determines collocation strategies to significantly reduce the total cost of ownership of their services offered to the consumers. The major outcome determined in this report is the requirement of a firm and stable regulatory body. Wyman (2008) outline the execution level challenges causing slow implementation of outsourcing deal in realizing network sharing's model to monetize promised benefits.

Research presented by Hasbani, Darwiche, Mourad and Chanab (2007) outlines the challenges faced by the telecom companies and operators in terms of government regulations. There is need to determine enforcement agencies for regulating tower infrastructure sharing. Thus ensures compliance for successful adoption of infrastructure-sharing obligations, regulatory access and communicate the overall benefit of infrastructure sharing. These agencies need to be equipped to resolve any eventual disputes.

3. Tower Management Industry

The tower management companies have been in the business for number of years as they continue to support telecom operators globally installing towers and other active and passive infrastructures required as a part of wireless communication networks. Earlier, telecom operators in India had tower management as an integral part of their business and they had teams dedicated and focused on it. It was realized by the telecom companies that tower installation and commissioning is not their core line of business hence most operators outsourced that function. This created several tower management companies in India.

The tower companies in India could be classified in three different categories based on the drivers for their creation. The most successful are the ones who have been formed by pulling internal resources into a separate venture such as Indus Towers in India. These Tower companies formed through a charter to support operators in India and outside.

Table 1: Telecom Tower Operators (Current market share of companies)

Tower company	*Tenancy ratio*	*No of towers*	*Description*
Indus Towers	1.95x	110,000	JV between Airtel, Idea & Vodafone
Bharti Infratel	1.9x	35,000	Subsidiary of Airtel
Vion Networks	2.4x	50,000	Private owned QTIL + TTSL merger
Reliance Infratel	1.74x	50,000	Subsidiary of reliance
BSNL /MTNL	1.07x	70,000	State owned telephone companies
GTL Infra	1.2x	35,000	Private owned
Others	1.47x	60,000	ATC, Aircel, Essar, Tower Vision, Aster Infrastructure, KEC International, and India Telecom Infra etc.
Total	1.7x	410,000	

1. Joint ventures – e.g.; Indus towers a JV formed by Airtel, Vodafone and Idea.
2. De-merger – e.g.; Reliance Infratel a wholly owned subsidiary of RCom.
3. Independent companies – e.g.; GTL a pure play operator

The others small Telecom Tower companies include Aircel Tower Vision, Aster Infrastructure, KEC International, India Telkom Infra, etc. There are number of global tower companies such as American Tower Corporation and Crown Castle Corporation who have been primarily North America or European markets based. Some of them have started making inroads in the Indian Telecom markets as well.

At present telecom operators in India have around 410,000 towers in use as shown in Table 1 and estimated projected growth of 100,000 towers during the next 3 years. This projection may come down due to consolidation of telecom operators.

Tower sharing agreements between mobile operators (incumbents and new entrants) and tower companies in an outsourcing contract offer both OPEX and CAPEX benefits depending on the sharing model as shown in Table 2.

3.1. Working Model in Tower Management

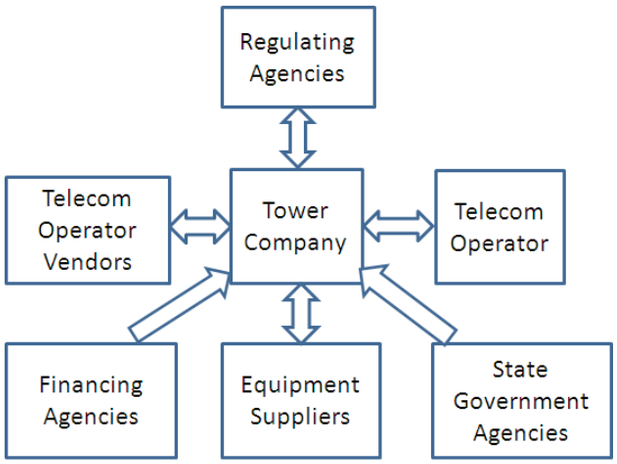
The extraordinary growth in mobile subscriber's base in India over the last few years has created huge opportunities for the telecom infrastructure industry. The tower industry is also growing continuously with the active support of the Government. During the early years, the mobile operators used to manage the installation and

Table 2: Various Models Tower Sharing and Outsourcing

Operating Model	*Benefits to Incumbent*	*Benefits to New Entrant*
Selective Tower Sharing	OPEX reduction Plug network inadequacies, especially in urban areas	Not applicable have no assets to share
Sharing Separated Tower Assets	Savings through removal of depreciation costs Transfers CAPEX to OPEX Unlocks latent value by opening up equity	Not applicable to new entrants/Greenfield operators
Fully Fledged Sharing Through Joint Ventures	Cost savings through reduced O&M expenditure Creates high entry barriers for other competitors	CAPEX cost reduction
Outsourcing to Third-Party Providers	Similar savings potential as a joint venture model	Lower CAPEX, slightly increased OPEX Ensures quicker time-to-market

maintenance of the mobile towers. The intense competition among the players in the telecom industry forced all the operators to look for opportunities to reduce the capex by outsourcing network related activities; requiring huge capital and operational expenditure. Some of the telco's created their own captive tower companies while a few others pooled the towers and formed joint ventures. In India, even today operator controls 90% of the market share in tower companies.

Figure 1: Multivendor Working Model for Tower Companies



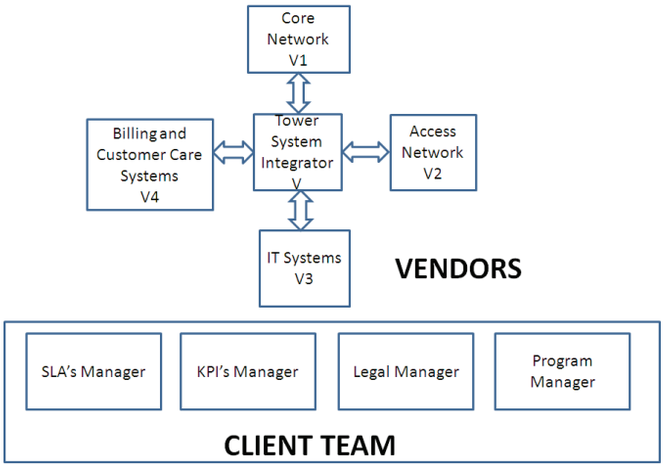
The working model for telecom tower companies is where the Tower Companies deal with all the suppliers and partners related to tower construction to O&M; whereas; the telco's can concentrate on their core business. The risk, finance, suppliers/ partner management, working with government agencies is all dealt by tower companies in the outsourcing of towers by telco's.

Telecom operator has requisite permissions and licenses for undertaking all the civil work for erecting towers and building hut to house electronic controls next to the tower. Towers can go live only after an operator ensures that all the work complies with guidelines. Infrastructure sharing has become one of critical decisions by operators due to increased pressure on the bottom line and controlling cost of operation. Tower sharing has been used as one of the strategies by operators. Earlier towers were exclusively used by certain operator who has acquired land or rented land, has obtained necessary licenses and clearances from the local bodies, installed all the active and passive components, and maintain them. This scenario is changed as towers are shared by multiple operators. Some towers are exclusively used by an operator and are not shared with any other operator simply for competitive reasons.

4. Multisourcing in Telecom

The outsourcing model which is mostly getting wider acceptance is about multisourcing. Instead of working with a single vendor, clients prefer to sign short term contracts with multiple vendors as vendors also continue to specialize in their respective domains. This model poses number of challenges to the client management to manage diverse set of vendors and ensure that they continue to deliver SLAs as agreed upon in the contract while vendors need to collaborate and cooperate so that end to end SLAs are delivered.

Figure 2: Multisourcing in Telecom



In Figure 2, it is obvious that a typical telecom company could be working with several vendors (V, V1, V2, V3, and V4) who manage respective portfolio together with others. There is a critical set of metrics which could be used as a gauge for monitoring performance. They are discussed in the next section. The client team is primarily focused on verification of SLA delivery, identifying KPI's and collecting data for verification, and dealing with legal issues that may need to be addressed during execution of the contract.

4.1. Critical Metrics for System Integrator

Most of the research work that is published in various journals primarily discusses IT outsourcing but there is hardly any literature published that deals with telecom networks or infrastructure outsourcing. Similarly there is very limited discussion among the research community regarding the challenges faced by Systems Integrators during contract implementation especially when there are

multiple service providers working for the same operator. A critical set of metrics is identified from a system integrator's perspective for understanding and analyzing challenges faced by a system integrator and solutions are proposed for implementations.

4.1.1. Contract Formulation

In a multisourcing environment, contract formulation for each vendor is extremely important. Not only expected deliverables must be properly spelled out but due to dependencies of various functions and processes which are handled by different vendors, high level of collaboration and accountability is critical.

Figure 3: Impact Contract Formulation

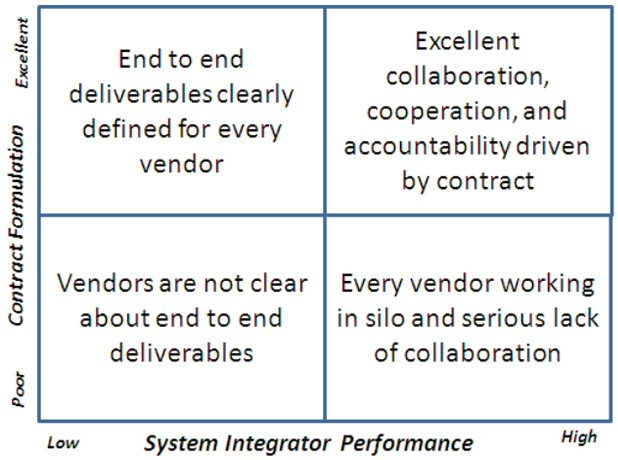
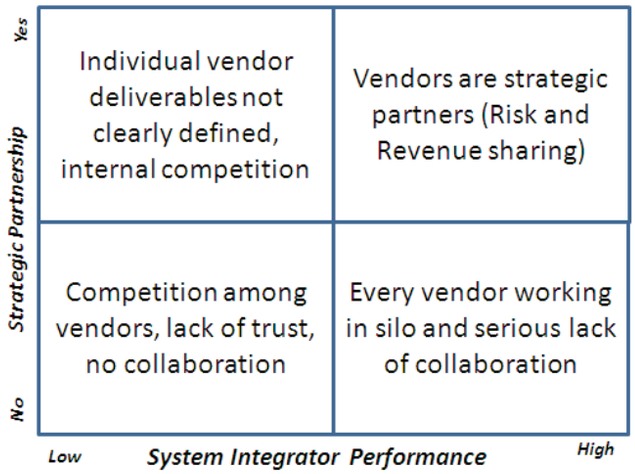


Figure 3 shows how contract formulation can impact system integrator's performance in a multisourced environment. This is valid for every vendor in such an arrangement. Usually the focus is on SLAs and most of the discussions between the vendor teams and client teams are around SLAs. Contracts do talk about legal issues involved at various points in the implementation and also payment terms and conditions but that may not be enough.

4.1.2. Strategic Partnership

Clients are creating strategic partnerships with select vendors and they are adopting risk and revenue sharing models with them. The vendor teams are taken in confidence for sharing the short term and long term strategy of the company so that the vendor teams can add value by ensuring their efforts are in sync with the strategy.

Figure 4: Impact of Vendor as a Strategic Partner



It is observed that if the vendor and clients have established strategic partnership in which risk and revenue are shared, vendor's performance can be positively impacted. If clients fail to do that there could be a misalignment in understanding of the vendor teams. There are various working models for forming strategic partnership. It is up to the client to decide on the model to be implemented.

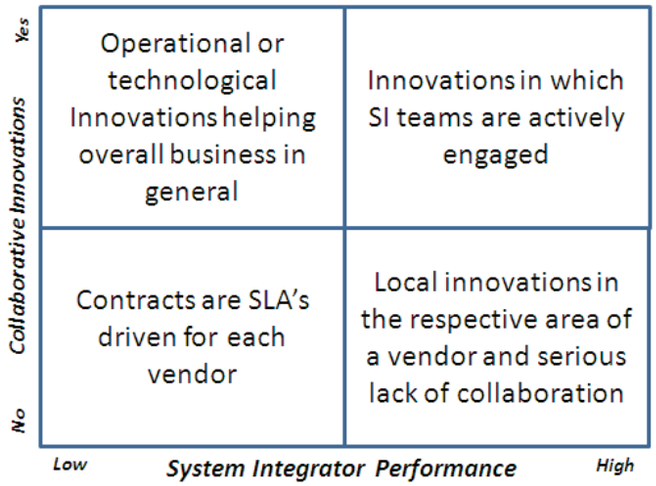
4.1.3. End to End Delivery

This is an important metric as end to end process could be broken into pieces. A typical example as shown in Figure 2 where network is broken into core network, access network, towers, etc. The objective is to deliver highest level of customer experience by delivering desired services as expected. Multiple vendors are responsible to deliver that in totality. Proper definition of SLAs would be critical for ensuring end to end delivery at highest quality.

4.1.4. Collaborative Innovations

It is observed over the years in outsourced contracts that the level of innovations is very low. Innovations can be in operational processes or enhancing capabilities of products or services, and technology improvements. In a multisourced environment it is even a much taller order for creating innovations but collaboration among all the vendors is the key.

Figure 5: Collaborative Innovations



Innovations need to be driven from the top which means it must be part of the contract, there must be clear expectations from the top management, expectations must be practical, client must create environment to promote innovations, etc. It is noted in published research papers on outsourcing that not much of innovation is taking place in outsourced contracts. Innovation could be simple that improves existing processes or enhances productivity or it could be radical that will provide a paradigm shift.

4.1.5. Cooperation and Competition

It is likely that in a multisourced environment there may be subtle competition among vendors for getting a larger part of the business in the next cycle of negotiations. There could also be an insecure feeling among certain vendor teams that their contract may not get renewed in which case information sharing suffers hence the deliverables. There could be healthy competition as well as collaboration. The term is 'Competition'. Innovative terms and conditions need to be part of the contract so that vendors collaborate. Unless there is a high level of collaboration among teams, innovations may be hard to come by.

5. Proposed Framework

It is obvious that critical set of metrics as discussed in previous sections of the paper have profound impact either positively or adversely on the overall performance of a systems integrator. In a multi-vendor situation every vendor in a way is a system integrator as there could be customer-supplier relationship among most of the processes or functions which have been outsourced. These dependencies if addressed correctly from the initial stage of contract formulation could be turned into an advantage as vendors will bring different skills and competencies to the table in their respective domains along with the best practices. It is really up to the management team of the client to harness this together for getting maximum ROI from outsourced projects.

Figure 6: Impact of Critical Metrics on Vendor Performance

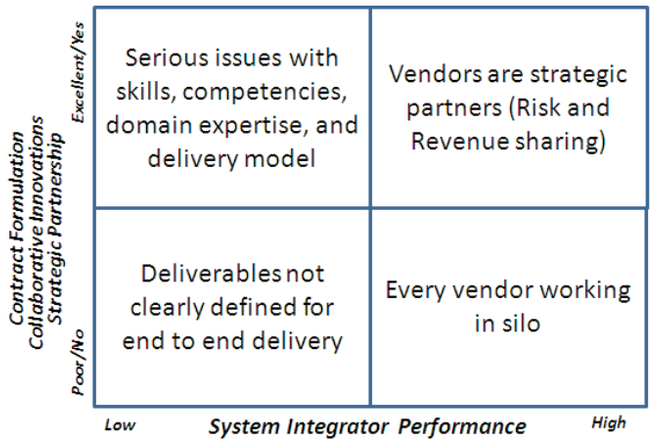


Figure 6 clearly suggests that the client team needs to formulate the contract which not only defines SLAs for each vendor but needs to spell out that irrespective of who is working on what, client team will expect end to end SLAs to be delivered. This will mean that all the vendors will have to work in harmony and collaborate. Clients are not outsourcing various processes and functions only to reduce capital and operational expenses anymore but there are expectations from vendors to create innovations at various levels to maintain competitive position of the client in the market place. Collaborative innovations is the only way in multisourced environment for which it is also suggested that the vendor should form strategic relationships with various vendors contracted for different parts of the operation as shown in Figure 2. The client senior management must demonstrate through leadership and performance the level of seriousness in promoting collaborative innovations.

It is also noted that client team must design SLAs which could be delivered and are practical. There could be a tendency on the part the team to design SLAs which never existed before the decision of outsourcing was taken. This could be the result of retaliation on the part of client team due to several factors such as loss of jobs, loss of functions, change in the role which may not be as

challenging and visible as it used to be before, and lack of career growth. The system integrator will go through due diligence before signing for SLAs in the contract but client teams could consciously reduce the entire process time by being practical.

6. Conclusions

Multisourced outsourcing is the reality and increasing number of clients are going for this option. Also duration of the contracts is getting shorter as very few clients are signing deals that are longer in duration that ranges from 7-10 years. Cost reduction is now given and assumed benefit from every outsourced deal hence clients are looking for strategic advantage and promote more collaborative innovations.

Under these circumstances, contract formulation is the key followed by demonstrated seriousness by the senior leadership for creating innovations on both sides. There will be several issues on the tactical side but end to end delivery of SLAs by team of vendors will be imperative for the renewal of contracts in the future. Contracts will be smaller in size in dollar terms and shorter in duration.

It is recommended that the contract terms and conditions should clearly spell out expected level of collaboration between multiple vendors. There must be adequate allocation of funds reserved for promoting collaborative innovations and the environment must be created that will encourage team work, innovations, and end to end delivery. The client management must recognize innovative contributions by the client and vendor teams.

Client and vendor teams must use and implement best practices of multi-site; multi teams project management which will enhance knowledge and information sharing. Information sharing is the key for collaborative work. Since multiple vendor teams will be working together for delivering end to end SLA, clear demarcation of responsibility and hand off must be defined by client teams.

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Enhancing Customer Shopping Experience with Indoor LBS in Retail Stores

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Abstract

Indian Retail sector has seized every opportunity and has evolved over the time from weekly markets and fairs towards a more organized form of supermarkets and malls. Evolving mobile technologies are now implemented in every field including the retail markets. This paper is focused on the how the field of telecommunications can be leveraged to enhance the customer shopping experience using Location Based Services in the Indian retail space.

Location based Services are set of applications which use the position data of a person or object to provide with relevant personalized information. These find vast use for Navigation services, Geo-tagged news, Gaming, Social networking and Advertising.

Organized retail in India over the past four years has shown a CAGR of 19.5%. One stop stores like the Hypermarkets is the new trend with huge shelf spaces and large product lines because of its enhanced efficiency and customer experience. But, this scale also induces challenges for both the retailers and the customers. The following are the list of challenges faced by customers and the retailer

- Matching the exact needs of the customers without much wandering [*Navigate*]
- Absence of exact match of requirements [*Availability*]
- Providing accurate and timely information/ updates [*Dynamic*]
- Uncertainty on the availability of the product [*Update*]
- Lack of knowledge on the arrival of the stock and managing inventory [*Efficiency*]
- Retaining customer base and keeping them involved [*Engage*]

Many retailers are already using the RFID technology to increase supply chain visibility, manage stocks and supplies efficiently. With LBS, retailers have whole new set of services to offer to customers and improve their shopping experience while at the same time leveraging this technology to increase revenues and maintain loyal customer base. Creating the right eco-system and implementing right mix of Wifi, LBS and smart devices for customer services, retailers can evolve the local malls to Smart Malls.

Keywords: Retail Sector, Location Based Services, Customer Shopping Experience

1. Introduction

Innovations in the field of telecommunication are now touching the lives of humans in every aspect. According to Richard Branson –

'Business opportunities are like buses, there's always another one coming'

That's how the retail sector has seized every opportunity and has evolved over the time from weekly markets and fairs towards a more organized form i.e. the supermarkets and malls. The Indian retail space has also followed the same path. The retail sector is the fastest growing sector in the Indian economy. It is comprised of both organized and unorganized sectors. This transition has made the environment more competitive with the mom and pop stores under severe stress because of the emergence of supermarkets and departmental stores which enabled efficiency and enhanced shopping experience. Organized retail in India over the past four years has shown a CAGR of 19.5% compared to 11% growth of the total retail space *(Deloitte, 2010)*. More recently, the corporate backed retail spaces and hypermarkets are in vogue because of the increased western influence among Indian consumers and the corporate. Retail facilities with a range of products and variety beyond the supermarkets come under the category of hypermarkets. These hypermarkets occupy huge floor space and are meant to cater the needs of a household while sticking to the idea of 'all under one roof' (GROUP,

2011). These one stop stores with huge shelf spaces and large product lines have thus induced lot of complexity for both the retailers and the customers. Further, we will list out the challenges in the retail space and how the evolving mobile technologies can be leveraged to address them.

2. Leveraging Location Based Services

Location based Services (LBS) are set of applications which use the positional data of a person or object to provide with relevant personalized information. These find vast use for navigation services, geo-tagged news, gaming, social networking and advertising.

Various technologies used to identify the correct position and provide these LBS are:

- Simple GPS based location detection which requires the cell phone to be equipped with GPS chip
- GSM localization which finds location of a mobile device to its nearest cell site/tower
- Bluetooth, Wi-Fi and RFID based solutions also exist which provide better indoor location data

These applications assist the user with personalized content and can be accessed through different channels for delivery to end customer:

- SMS updates are common to engage the customers
- Social networking websites is another tool
- Android and other OS based applications for the smart phones to access these services
- USSD menus to provide customers with various options to choose from and interact further

Modern day retailers have a lot of challenges in terms of adapting to the latest technological innovations to compete in the dynamic Indian markets. The latest technology and infrastructure implementation in the retail space is essential to match the increasing customer expectations, global shopping standards and to compete with the efficient and effective online shopping stores.

Many Indian retailers are already using the RFID technology to increase supply chain visibility, manage stocks and supplies efficiently. With LBS, retailers have a whole new set of services to offer to customers and improve their shopping experience while at the same time leveraging this technology to increase revenues and maintain loyal customer base (Mobile Marketing, 2011).

The Smartphone market is fast developing as consumers look for applications beyond voice and SMS and it will further intensify with high performance processors and enhanced battery life. Even though the trends indicate cumulative growth in the smart phone market, Indian mobile market still comprise of large customer base using feature phones which don't even support Global Positioning System (GPS). Thus Retailers need to have proper strategy in place to implement latest technology solutions which will enable them to cover the majority of their customer base effectively and provide them the best shopping experience.

3. Problem Statement

Changing lifestyles and time scarcity has driven the Indian consumer more towards the one stop stores like supermarkets and hypermarkets.

To present the current shopping scenario and issues related to the purchasing at hypermarkets, we will look at the story of an Indian consumer in a super market. Ram a frequent purchaser on a typical Saturday, was dumping the items in to his shopping cart at the supermarket near his house. He visits this place each week to meet the everyday needs of his family for the following week. The cart is full and he is wandering all over the shop floor, scanning for the items that he is supposed to purchase. Since it was a weekend by the time he approached the billing counter, the long queues and the additional time lost while wandering to locate the items he wanted, disturbed his schedule. These problems get compounded with the extensive parking facilities that are usually allotted to these large shopping spaces.

The following are the challenges that one might encounter while shopping in these large spaces

- Matching the exact needs of the customers without much wandering: The customer might have to spend substantial time understanding the shop floor plan about the various sections and then he/she has to identify the right shelf where he can pick the desired item.
- Absence of exact match of requirements: The customer because of the ignorance of a substitute and difficulty in finding assistance from the staff because of the large shop floor might end up leaving the place without any purchase. This will lead to less conversion rate of actual purchase versus footfall.

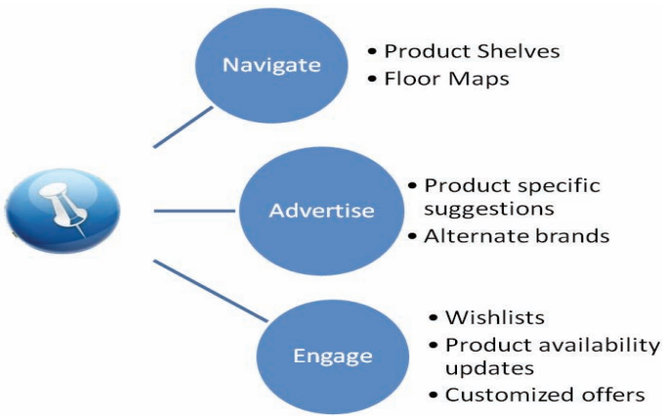
- Uncertainty on the availability of the product: The customer may get irritated to see that the product he/she is looking for is out of stock or is available in a quantity less than needed. This will lead the consumer to shift loyalty to another retail outlet.
- Lack of Knowledge on the arrival of the stock: The consumer once returned home without purchasing might want to wait to purchase the desired product .Lack of knowledge on the time of arrival of the desired product will also discourage the customer to visit the stores
- Challenge of retaining the customer base: A disgruntled customer will definitely not want to continue his association because of the issues mentioned above

In addition to this, these supermarkets will however have large parking facilities and the motorists find it daunting to locate their vehicle parking spot even after implementation of numbering mechanism.

4. Approach Towards the Solution

The pain points mentioned above have to be eliminated by every organized retailer. With the increased usage of Smartphones by people in urban setup, the field of mobile communications can be handy in solving the identified issues. The solution that is going to be proposed will also help in minimizing the operating expenses (Op-Ex).

Figure 1 Functionalities of the Proposed Solution



The retail sector is at a stage where the business models are inclined towards more automation to reduce the Op-Ex. Consider a scenario where the customer is assisted with by an interactive response/smart guide on his/her smart phone on how to navigate through the blueprint/ floor plan of the shop. The figure given below will give an overview of how the LBS can be improving the shopping experience in the discussed shopping model.

The *smart guide* thus implemented will result in limiting the operating expenses to the retailer. The staff overhead count can be minimized as the number of staff deployed with reference to floor space will come down. Hence, the *smart guide* will minimize both the customer facing and the non-customer facing staff which improves the net profit margin. Also the automation allows better inventory management and accurate forecasting , improved conversion rate of footfall and there by optimizing the occupancy costs, understanding the shopping trends of the customer and there by delighting the customer with the suitable coupons/ offers, etc.

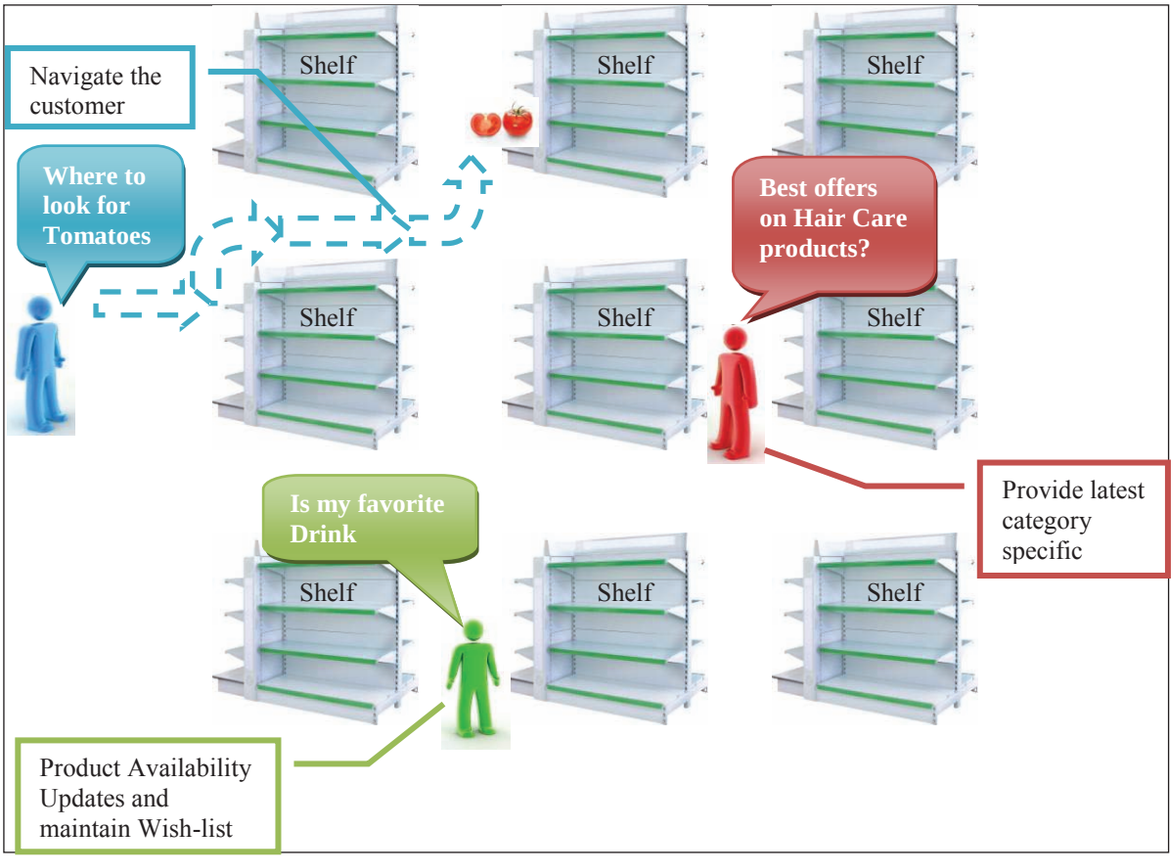
5. Technical Feasibility of the Solution

Indoor navigation is bit more complicated than outdoor navigation. Global Positioning System (GPS) which comes inbuilt with majority of the current generation mobile phones will not be accurate enough with indoor navigation. In GPS satellite navigation system, microwave signals are transmitted by the GPS satellites and based on the arrival time of signal the positional coordinates of the GPS enabled mobile devices are identified. Positioning using GPS will be accurate on when there is direct/sky line of sight from at least three GPS satellites.

These microwave signals cannot penetrate in the building interiors and hence accurate positioning of the device is difficult. Hence for indoor navigation Wi-Fi enabled beacons can be used to identify the device positional coordinates. The access points in the building will listen to the mobile phone and identify the location based on the method of Trilateration. Simple speed calculation and basic geometry explains this Trilateration technique of location identification. The distance between one access point and your phone can be obtained based on the arrival time of the signal. Similarly the distance between the phone and two other access points is obtained. The point of intersection of these three spheres will determine the positional coordinates of the phone.

Another important point for retailers to consider is the choice of channel to communicate with the consumer. It should not seem to be intruding the shopping experience of the consumer while at the same time providing him with innovative ways to discover the shop floor. SMS over the time have been vastly used by marketers to promote products and features. Thus consumers may feel them to be useless at time and may not value the information

Figure 2: In Store Navigation



communicated.

USSD which is a more engaging way of involving the consumer and recording their responses immediately can be a perfect channel for the retailers. The flash message which seems to interest the consumer can encourage him to further select options and use the information correctly.

Social networking sites provide consumers with unique way to communicate about what products to go for, the latest options, and feedback about brands. This makes it a must for retailers to utilize this channel. If they can link the custom applications with options that let the consumers engage on this social network websites then it provides retailers an opportunity with increased visibility and chances to attract new customer base.

6. Proposed Solution

Indoor LBS has provided retailers with opportunity to create unique intelligent environment for shoppers. The eco-system will have Wi-Fi Access points, RFID tagged Shelves/Products, navigation specific apps, shop floor maps and smart devices.

Through a defined set of applications specific to navigation, engagement and customer relationship management, retailers can ensure that customers will have reason to come back to their store for shopping. The following image displays the features and capabilities the app possess

This experience should not be limited to customers handling Wi-Fi or GPRS enabled handsets. To ensure this, the location detection should not be limited to a single technique but overlap of multiple options available. As a retailer it may not be feasible to have the initial solution cover entire customer base hence starting with local Wi-Fi location detection to enable them to measure the impact on shopping experience of customers.

Smartphones with GPS support will enable the customers to avail maximum benefit by real time navigation to the products (Martin, 2010). A simple Floor Layout map can guide the customer throughout the store. A consumer can

Figure 3: USSD Menus

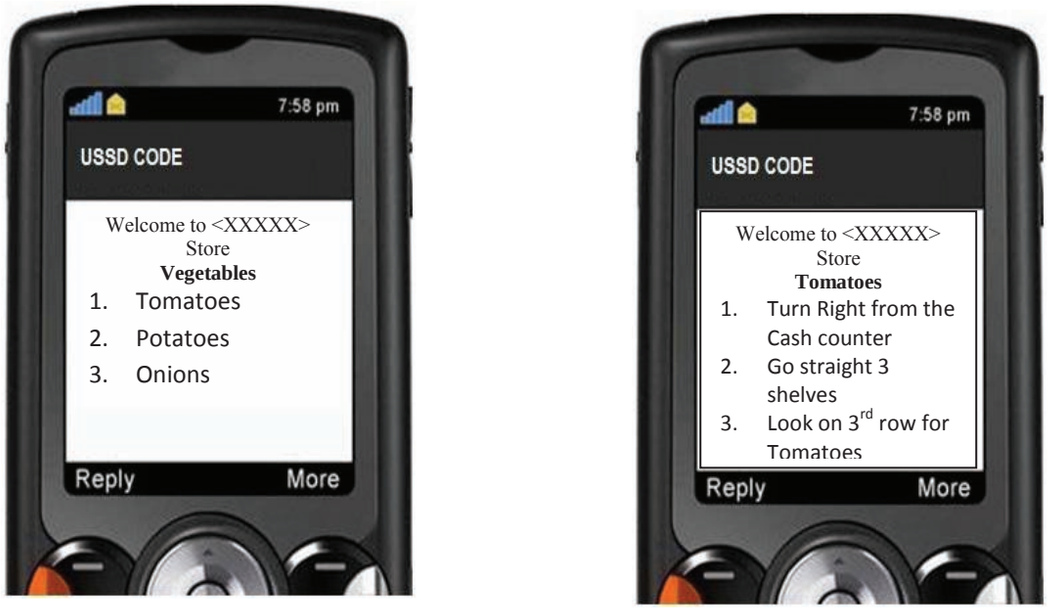
check if any friends are also visiting the store and can interact before making any purchase decision.

As important is the other aspect of delivery channel to customer and it should also be a mix of SMS, Flash Messages and USSD Menus. USSD will create a perfect combination with LBS to provide particular applications to customers which will not be forced on them or seem to intrude their time in store.

The following images show how a simple interactive USSD menu containing basic options can guide the customer as per his/her requirements:

A look at the menu options show how the user can interact with the USSD system and get directions to reach the right shelves. Although this service does not adjust to the real time positional coordinates of the mobile devise, it

Figure 4: Shelf Locator using USSD Menu



still can direct the customer from a fixed point/location.

The below image shows how USSD menu can assist in locating the tomatoes shelf using the cash counter as a refernce point.Despite the limitations on positional coordinates this service can still engage the customers to a certain extent and assist in locating the required goods.

7. Retailer Benefits

- Directing the customers to the right shelf's- Firstly, the customer of today will prefer smart navigation tools to find the shelves instead of taking instructions from some individual, particularly in a large shopping space. So by using the technique of Trilateration the real time position of the devise with respect to a product shelf can be obtained. Most importantly, this smart navigation technique will save lot of time to the customer and minimizes human effort to the seller/vendor (Sheldon, 2011)
- Responding to the queries and providing an alternative including special offers-Customer stickiness is key factor for sustainability of any business/sector. Suggesting the customer about special offers and assisting with possible alternates for the desired product will improve the customer stickiness.
- Enables the customers to create wish lists and hence provide customized alerts- Customized alerts on arrival of wish list items/products will help the customer in making his/her purchases more efficiently which in turn will enhance the customer experience.

8. Challenges

The technological feasibility and utilities attained from implementing Location Based Service to enhance the customer shopping experience has been discussed in detail in the previous sections. But, the glass is not full if the challenges faced in implementing these services are not discussed in this white paper. The retail sector must overcome the following potential problems to benefit from the technological advancements.

- Precision to an extent of close to a feet is to be achieved
- For Unpackaged goods like vegetables a portion of the *Smart Guide* functionality like suggestions on substitutes, availability, etc. is not applicable because of the complexity involved in quantifying the stocks.
- If customers are not technology savvy people then utility levels of these services will drop.
- The positional coordinate's capture of the user location might raise privacy issues.
- The LBS based applications and Wi-Fi network beacons should not be too intrusive and disturb the primary utilities of the customer mobile.
- Another major concern is the commercialization of consumer purchase patterns which needs to be

addressed for wide acceptances of these services from the customers.

- Finally the security of user's personal data and account information needs high priority.

9. Conclusion

Thus, this paper emphasized on how to leverage the advancements in telecommunications field to improve the shopping experience in large spaces. In order to achieve this, the eco system needs to be strengthened in a way that this implementation is sustainable in the longer run.

Thus, the digital shopping environment with help of LBS can provide exciting shopping experience to the consumers in the future. This implementation of LBS for retailers will provide them with a tool to differentiate their services and provide additional value to consumers. It also provides retailers to efficiently utilize social networks to be used as a marketing tool. Even if they are not very familiar with digital marketing this provides them with an opportunity to explore and understand this medium. This is the perfect link to the future where customers are going to be fully dependent on mobiles, tablets and other smart devices to manage their daily shopping requirements.

10. Epilogue

Thus, this paper emphasized on how to leverage the advancements in telecommunications field

This implementation can be extended beyond retail sector and can span across several other sectors. The following is the list of such extensions

- Customer Profiles if linked to their respective device/smart phone, with the use of *Big Data analytics and Infrastructure* can understand the shopping pattern and can provide the customer with coupons and promotions instantaneously (Dijcks, 2012).
- Updating the customer with the product availability-When the customer can check the vendor can meet his requirement in terms of quantity and quality in advance then the customer can plan his/her purchases accordingly.
- In addition, this mechanism of smart navigation can also be applied in various locations. Possible sites for replication of similar services includes
- University Campus
- Trade fairs
- Zoo
- Museum
- Locate your vehicle- Another possible extension could be, tagging /pinning the vehicle location in the map will help in tracking the vehicle easily .This implementation is particularly beneficial in large parking lots.
- The shopping carts in the hypermarkets can also be fitted with a small charging point at top and also the same cart can act as a Wi-Fi access point to track the customer real time positional coordinates if he/she is not carrying a Wi-Fi or GPS enabled smart phone.

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Impact of IFRS on Financial Aspects of Indian Telecom Operators: A Conceptual Framework

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Abstract

International Financial Reporting Standards (IFRS) are now to be compulsorily followed by all companies in India. The transition to IFRS-converged accounting standards has already started and is being implemented in a phased manner from 2011 to 2014. This is supposed to bring about global unification of standards for reporting financial information to shareholders, lenders and various other stakeholders.

Implementation of IFRS-converged accounting standardsis going to give rise to various changes in reporting which will have an effect primarily on financial statements and consequently on certain aspects of financial management. The implementation of IFRS is going to affect not only the disclosure of profits (income statement) and financial position (balance sheet) but also financial performance and decision making.

The changes in reporting are likely to impact various financial aspects. Such financial aspects include (but are not limited to) revenue recognition, cost and profitability aspects, capital budgeting policies, working capital management,etc.There are a few unique issues and financial implications thereof, related to application of IFRS to telecom industry which need special attention.

This article attempts to propose a conceptual framework for analysing the effect of IFRS (with special reference to IFRS applicable to Indian Telecom Operators) on certain financial aspects of business such as revenue recognition, property plant and equipment, intangible assets, impairment of non-financial assets, outsourcing arrangements, provisions and contingencies, inventory, borrowing costs, etc. The parameters considered for analysis include various drivers of profits, financial position, earning per share (EPS) and Enterprise Value.This framework could also be applied to telecom companies in other countries with suitable modifications / adaptation.

Keywords: IFRS, Impact, Financial Aspects, Indian Telecom Operators, Conceptual Framework

1. Introduction

There are various forms of business organisations. They have pre-defined financial objectives which include profit maximisation and wealth maximisation. For achieving these objectives, the top management takes various decisions including financial decisions. These decisions are expected to be in the interest of the owners i.e. shareholders. In fact, shareholders' wealth maximisation is considered to be main objective of corporate financial management.

2. Financial decision making

To achieve the two basic objectives as mentioned above,the top management takes various financial and other business decisions. The financial decisions include:

1. Financing Decision (Capital Structure decision): It relates to raising of funds at required quantum, at lowest cost and at right time.
2. Investing Decision: (Capital Budgeting decision):It relates to investing these funds in various assets to get maximum returns. It is a long term decision.
3. Working Capital Decision: It relates to short term financial decision making i.e. management of current assets and current liabilities. This includes ensuring adequate liquidity at all times and at all levels.
4. Dividend decision: It involves management of profits and their distribution to shareholders.

In financial decision making, "a business proposal which maximises value of the firm is always accepted." The value of the firm will increase only if present value of the future stream of *net cash benefits*is more than initial *cash investment.* Thus,cash inflows and outflows are more important than accounting profits.To select the best proposal, we need to arrive at present value of future cash flows. Therefore, time value of money plays an important rolein financial decision making. Due to introduction of IFRS / Ind AS, time value of money which is extensively used in financial decision making will now also be used while applying a few Ind AS. (e.g.: Refer to Ind AS -16: Property, Plant & Equipment). Such financial concepts are now also going to be used in application of these accounting standards, thus bridging the conceptual gap between financial decision making within the company and reporting of financial results to stakeholders and others.

3. Financial Decisions and Financial Statements

The financial performance of an entity is reflected in its financial statements. The financial statementsalso reflect the impact of financial decisions on income, expenses, assets and liabilities. For the same reason, financial statements are mainly used in financial decision making by various stakeholders such as investors, financers and creditors.

As per Ind AS, a complete set of financial statements comprises of balance sheet including statement of changes in equity; an income statement i.e. profit and loss statement; a cash flows statement and notes with significant accounting policies and other explanatory information. It further includes abalance sheet as at the beginning of the earliest comparative period when an entity applies an accounting policy retrospectively or makes a retrospective restatement of items in its financial statements, or when it reclassifies items in its financial statements.

A statement of Profit& Loss would present the financial performance in the form of profit earned or loss sustained by the company. The financial performance is generally assessed on the basis of OPBDI&T, PBIT, PAT and EPS. These parameters indicate the profitability of the enterprise, whereas Balance Sheet indicates the financial position of an enterprise. It consists of the statement of assets and liabilities. The excess of assets over outside liabilities indicates increase in the wealth ("net worth") (as per books of account) of shareholdersand vice versa.

The elements appearing in above statements are affected due to changes in accounting policies through accounting standards and resultant treatment. A change in accounting standard / policy bringsabout changes in above statements. These changes and adjustments therefor will impact financial decision making and thus, various aspects of financial decision making are going to be largely affected by implementation of IFRS.

The effect of managerial decisions on a company's profit is reflected in the Profit & Loss Account, on financial position in the Balance Sheet, and on cash in the cash flow statement. The importance of these statements cannotbe over-emphasized since major strategic / financial decisions are taken on the basis of these statements.

The financial statements are subject to professional and / or legal regulation. There are professional accounting bodies which govern the accounting practices in a country.[1]The Institute of Chartered Accountants of India largely regulates the accounting policies, principles and practices in India. For strict control and for benefit of public at large it has issued various Accounting Standards and Guidance Notes from time to time. Now India companies need to adopt IFRS / Ind AS in a phased manner.

It is pertinent to note that changes in accounting standards / accounting policy would bring about changes in company's profitability and financial position, which has to be accepted by the management as an external unavoidable phenomenon.Therefore, the impact of Accounting Standards / IFRS on financial statements and consequently on financial decision making is required to be critically appraised.

There are some noteworthy features of Indian GAAP;

a. Application of accrual concept without consider-ation of 'Time Value of Money';
b. Emphasis on 'True and Fair' view and not on 'Faithful Presentation';
c. Use of estimates while preparing the accounts which may not be based upon scientific methods;
d. Use of historical cost instead of fair value;

So far, the existing policies, principles and practices have been considered satisfactory, in spite of the above limitations. But the compulsory adoption of IFRS by Indian companies (in a phased manner) has challenged

fundamental concepts and assumptions underlying Indian GAAP.

3.1. The Financial Aspects

Consequent upon adoption of IFRS, changes in particular accounting policies would bring about changes in various financial aspects(parameters considered for analysis) which include profits, financial position, earning per share (EPS) and Enterprise Value.

3.2. The Statement of Purpose & Status:

This framework proposes certain concepts and parameters to analyse the effect of IFRS on financial aspects of Indian telecom operators. The purpose of the proposed framework is:

1. To assist external users of financial statements to understand the link between various IFRS applicable to Indian telecom operators and their financial decision making;
2. To assist corporate managementof Indian telecom operators to understand the impact of IFRS on financial decision making;
3. To propose a direction and further scope of study of 'impact analysis' of IFRS on financial aspects / financial managementof Indian telecom operators;
4. To identify and / or to explore possibilities of further changes in financial reporting requirements in the light of above impact analysis.

The proposed framework is presumed to be flexible and adaptable and will be subject to changes from time to time based on the experience of actual implementation and empirical findings about the impact thereof, since IFRS implementation is still at the nascent stage in India.

3.3. Scope

The framework deals with:

1. The analysis of relevant IFRS as applicable to telecom operators;
2. Analysis of shifting from AS to IFRS in the Indian context;
3. Impact of application of IFRS on certain selected financial aspects of telecom operators.

4. Introduction to Present Position of Financial Statements in India: (Pre-IFRS)

The financial performance of an entity is reflected in its financial statements. The objective of financial statements is to provide information about financial position which is included in the balance sheet, financial performance which is included in Profit & Loss Statement and cash flows of an enterprise that is useful to a wide range of users in making various economic decisions. Thus there is a reflection of financial decision making in financial statements. IFRS, a comprehensive and global set of accounting standards will now be mandatorily applied for preparation of financial statements in India. Therefore it is necessary to analyse the impact of IFRS on financial statements and consequently, financial decision making.

Impact of IFRS on financial decision making

4.1 Salient Features of IFRS

1. IFRS is a principle based approach. It mentions principles rather than detailed rules. It gives more scope / discretion to management in selecting a particular accounting policy. Thus application of IFRS would lead to substance over form.
2. Fair Value Accounting: There are two approaches i.e. historical cost based approach and fair value accounting. So far In India, companies have beenfollowing historical cost based approach; however under IFRS, fair value accounting is also allowed to be adopted. Fair value accounting is specifically applicable to assets and liabilities. After the 3G spectrum auction in India, many of the telecom operators are heavily ridden by debt. In such cases, fair value accounting would play a critical role in respect of assets and liabilities.

Although Fair Value accounting is one of the main features, it is observed that it is still not used widely by the enterprises. According to a survey conducted by KPMG andKeitz (2006), from 15 countries, 2% of the companies actually applied fair value accounting to property, plant and equipment in 2005. The same survey indicated that, in relation to intangible assets, fair value accounting is not applied by the companies being surveyed.

3. **Statement of Comprehensive Income:** It will include unrealised gains and losses arising out of fair

value accounting of assets and liabilities. It would also be called as 'other comprehensive income'.If a company applies IFRS, then a major change would be in the form of fair value accounting,which if adopted, will affect assets, liabilities and equity. The ultimate profit would also be affected due to comprehensive income. If most of the items in the balance sheet are revalued then the unrealised gain or loss would be routed through profit & loss account in the nature of comprehensive income.

4.2. The Telecom Sector in India

The telecom operators' business has some unique features.The Indian telecom industry has recently undergone tremendous growth as well as transformation. This is evidenced by increase in number of subscribers, teledensity and overall revenue, change in technology, government support for penetration of these services etc. Since the private players have already heavily invested in this sector post liberalization, now they are anxious to devise strategies to earn proper returns on their investments.

Some of the Indian telecom operators are listed companies while others are not. Over a period of time IFRS will apply to all these companies. The alphabetical listings of the Telecom companies are: Aircel, Airtel (Listed Company), BSNL, Idea (Listed Company), MTNL (Listed Company), MTS, Reliance (Listed Company), Tata (Listed Company), Uninor, Vodafone.

The listed telecom companies have already adopted IFRS for the first time with effect from 1st April 2011. Selection of accounting policies at the time of first adoption is critical since would affect financial statements for subsequent years.

4.3. Benefits of IFRS Adoption

The adoption of IFRS will help companies to tap foreign capital markets, enhance comparability and will be especially useful to multinational companies. The implementation of IFRS requires valuations and future forecasts, thus giving rise to use of estimates and assumptions. All this implies that board members would have greater responsibility and accountability.The International Accounting Standards and IFRS consist of a single set of high quality accounting standards which can be used globally. It will be useful in presenting transparent and comparable information in relation to financial statements. Application of IAS, IFRS will be useful to potential users who need information for taking different types of decisions. There are 9 IFRS and 29 IAS along with interpretation notes (IFRIC 1 to 19).

5. IFRS Adoption and Telecom Operators

There are a few specific IAS which will apply in a unique way to telecom operators. We propose that the framework to analyse the impact of IFRS on financial aspects and corporate financial management of Indian telecom operators should include a critical review of following IAS (Accounting Under IFRS: Telecoms, January 2010 KPMG IFRG Limited)–

Accounting Issue	*Relevant IAS / Ind AS*
Revenue	18
Capacity Transactions	16. 17, 18, 38
Intangible Assets	38
Property, Plant & Equipment	16
Borrowing Costs	23
Impairment of non-financial assets	36
Leases	17
Financial Instruments	39
Provisions & Contingencies	37
Interests in joint ventures	31

In our opinion, a few more Ind AS would also affect telecom operators and have a specific financial impact such as: Inventory (Ind AS-2), Depreciation (Ind AS-16), and Earning per share(Ind AS -33).

5.1. Some Illustrations of Issue and their Impact

While it is beyond the scope of this article to describe exhaustively the various issues arising out of IFRS implementation by telecom operators in India, some illustrations are given below to enable appreciation of some of these issues.

5.2. IAS – 2 / Ind AS 2: Inventories

While according to AS-2, to arrive at cost of inventories, selling and distribution cost shall be excluded whereas according to IAS-2, only selling cost shall be excluded i.e. distribution cost shall be part of inventory valuation. In case of telecom service providers distribution cost is

vital.

Impact: This will affect the cost of inventory, resulting into change in reporting of profits (amounts will vary) and consequent impact on certain ratios such as EPS, ROI etc.This may also be useful in reporting better cost competitiveness and may provide justification of pricing policies if prices are controlled and for domestic or international transfer pricing.

5.3. IndAS – 16 (related to Depreciation Accounting)

Since IFRS is principle based, the management can decide its depreciation policy. Most of the telecom operators provide depreciation on straight line method on the basis of estimated useful economic lives of assets. The companies normally have their own estimates of economic lives of the assets. Due to this, different companies estimate different useful lives resulting into differing depreciation for same class of assets. (E.g.: Idea Cellular Ltd. In its Annual Report of 2010-2011, estimates economic life of Leasehold Improvements as equal to period of lease, whereas Bharati Airtel Ltd. In its Annual Report estimates it as period of 10 years or lease period, whichever is less).

In case of intangible assets special attention is required. 'Cost of Rights & Licenses' is amortized over a period of license. Software is amortized over its useful life as estimated by management. Bandwidth or fibre taken on 'Indefeasible Right of Use' (IRU) is amortized over the agreement period.

The depreciation under IFRS is mentioned in IAS-16 (Property, Plant and Equipment). It states that 'Each part of an item of property, plant and equipment shall be depreciated separately'. E.g.: Civil structure and tower installed on it will have different rates of depreciation. Similarly earlier the items below Rs. 5000 were depreciated fully; however after IFRS, in our opinion, the depreciation has to be charged on all items irrespective oftheir value. The methods of depreciation suggested under IAS-16 are straight line method, diminishing method and units of production method. Under IFRS, an entity is required to depreciate separately the significant parts of Property, Plant and Equipment if they have different useful lives (Component Approach).Any change in the method of depreciation is treated as change in the accounting estimates. It will be reflected in the depreciation charge for the current as well as prospective years.

Impact: Management judgementabout economic life of assets and change to component approach will vary depreciation provisions and reported profits thereby affecting various financial ratios like EPS, ROI, etc. and enterprise value. In as much as net worth will also be affected, borrowing capacity may be affected.

5.4 Ind AS – 18:Revenue

According to AS-9, revenue is the gross inflow of cash, receivables and other consideration arising in the normal course of business whereas IAS – 18 defines it as 'Gross inflow of economic benefits resulting into increase in equity'. Due to such inherent conceptual difference revenue recognition is crucial for telecom operators. AS-9 requires revenue to include all indirect taxes ("gross inflow") whereas as per IAS-9 these taxes *(being 'pass-through receipts')* will not form part of revenue. In case of an operator if total revenue collected is Rs. 1000 million which includes service tax of Rs. 100 million and trade discount and rebates of Rs. 10 million then for the purpose of IAS-18 the fair value of revenue is Rs. 890 million. In AS-9 it would have been the total amount excluding discount and rebates.The telecom operators' revenue is also affected by Revenue Leakage and Frauds; thus the role of Revenue Assurance and Fraud management pay an important role.

Impact: In such cases there would be a significant reduction in the revenue recognition because of adoption of IFRS with adverse impact on profit, net worth, EPS, and enterprise value, *inter alia*, since this would be a permanent change. However extent of impact needs to be studied on case to case basis.

Further AS-9 does not require any adjustment of discounting to revenue items whereas IAS -9 requires adjustment of discounting if cash flows are deferred. Because of this, telecom operators would be significantly affected since it is a service industry.

The recognition criteria for rendering services under AS-9 allowed both completed service method and also proportionate completion method; however under IAS-9, percentage completion method is compulsory. In our opinion, IAS-18 would require recognition of revenue on percentage of completion method. Even the customer activation fees will now be accounted for as:'amortization over the expected duration of the customer relationship'.

The telecom operators also offer bundled products consisting of hardware and software or combination of any two or more than two. E.g.: mobile handsets along with (bundled) services, set up boxes, internet connections etc. IAS-18 requires identification and consequent separation

of these items for the purpose of revenue recognition. In practice, the consideration is allocated to each component based on its fair value or fair value of undelivered products i.e. as per residual method. However determining fair value of each component requires complex estimates. Onemay have to refer to prices of individual component on standalone basis adjusted for volume discounts. For this purpose, to arrive at the value of each component separately, it should have a standalone value to customer and its fair value should be determinable. Thus the revenue from award credits shall be recognized only after the company fulfils its obligations to provide free goods or services. As of today most of the operators recognize service revenue on completion of provision of services however as per IAS-18 it should be on percentage of completion basis i.e. proportionate basis.

Impact: This will also have a material (significant) effect on profits,net worth, EPS, and enterprise value, *inter alia*, since this would be a permanent change.

5.5. Ind AS – 16: Property, Plant & Equipment

The major change as compared to AS- 10 would be towards determining fair value of assets, revaluation of assets from time to time, determining impairment loss and recognizing the changes or reversal of changes / losses through 'Other Comprehensive Income' in the Profit & Loss Account.

Due to its broad scope, it is observed that different companies follow different policies. In case of Airtel, under Indian GAAP the group revalued the passive infrastructure assets with corresponding increase in business restructuring reserve, whereas under IFRS these were stated at historical cost resulting in a material difference.

The telecom operators' main intangible assets are Goodwill, Licenses, Software and "indefeasible right of use" (IRU) bandwidth capacities. The depreciation / amortization of these assets play a key role. Under IFRS, companies are required to depreciate the assets based on their useful life.

5.6. IndAS – 36: Impairment of Assets

As per Ind AS -36, it is expected that telecom companies assess impairment losses to their assets at the end of each year. They will have to assess internal and external indicators which impair the assets. The impairment losses are measured in terms of individual assets other than goodwill. Such loss is the amount equal to a difference between carrying amount and its recoverable amount. It may also require telecom companies to identify cash generating units (CGU's). However considering the heavy infrastructure of telecom operators it will be difficult to identify CGUs.

If we look at the indicators of impairment then out of seven parameters almost all parameters couldapply which may not be a case for other sectors. These parameters are:

1. Market Value is declined or the entity has operating or cash losses,
2. Technological obsolescence,
3. Competition,
4. Market Capitalisation,
5. Significant Regulatory Changes,
6. Physical damage of assets,
7. Significant adverse effect on the entity which will change the way the assets are used / expected to be used.

Telecom operators need to consider these parameters thoroughly, to properly assess their impact on its asset position. Impairment losses related to Goodwill cannot be reversed whereas other impairment losses can be reversed.

5.7. Ind AS 33 – Earning Per Share

An entity shall present basic and diluted EPS for profit or loss from continuing operations as well as discontinued operations. As per AS 20 an entity shall present basic and diluted EPS for profit or loss from continuing operations.

Impact: Since disclosure relating to discontinued operations is mandatory, the implications of reporting such EPS have to be considered when taking such decisions.

5.8. Glimpses of Literature: Effect of IFRS on Financial Aspects of Companies:Need for research of impact of IFRS

A lot of literature is available indicating effect of IFRS on financial aspects of companies. Thus adopting IFRS has resulted into major changes in reporting and disclosure requirements in various countries. Accordingly there are regulatory changes too.The adoption of IFRS, resultant regulatory changes shall be reviewed in terms

of its impact on various countries having different set of economic conditions as well as on corporate financial decision making. It requires as a separate study of effect of economic consequences of financial reporting and related regulation.There is a lot of literature available regarding application of IFRS in various countries and its impact on financial statements, financial ratios and related financial aspects.

5.9. Potential Advantages of IFRS to Equity Investors

The adoption of IFRS provides advantage to various stakeholders including equity investors.It is observed that adoption of IFRSreduces cost of processing financial information. It may lead to improving market efficiency and resultant impact on stock price.Further adoption of IFRS offers increased comparability, reduction in information costs and reducing the information risk. (Ball et al.,(2006). The adoption of these standards have also shown increase in reported Earnings after Tax. Thus IFRS adoption and adoption of domestic standards will result into differing profit after tax. If profit according to USGAAP is taken as 100 percent, due to differences between national accounting standards, EAT would be 25%more in UK, 3% less in France, 23% less in Germany and 34% less in Japan (Barth et al. 2007). It is a major observation since change in profit will have major effect on financial decision making. The adoption of IFRS helps in comparing financial performances of companies across the globe. Since IFRS will be a single set of standard, the transactions will be treated in the same way across the globe resulting into better comparison for decision making.

5.10. Authors' Comments

While there are foreign investors in Indian telecom companies,Indian telecom operators have also started investing in foreign companies (e.g. Airtel acquired Zain in S. Africa). Implementation of IFRS would benefit these companies.Earlier It was possible for multinational companies operating in various countries that different sales values andprofits were reported by applying accounting policies which are in the best interest of subsidiaries or branches,but they might not conform to head office accounting practices. Post IFRS implementation, the information reporting would be globally uniform.

5.11. Economic Consequences of Accounting Quality

International accounting literature provides evidence that accounting quality has economic consequences, such as costs of capital **(**Leuz and Verrecchia, 2000), efficiency of capital allocation(Bushman and Piotroski, 2006) and international capital mobility **(**Guenther and Young, 2008). Thus IFRS would increase the transparency, uniformity and would increase the quality of overall accounting.

5.12. Possible Increase in Market Liquidity and Market Capitalisation

Another study conducted by Jermakowicz et al., 2007 has significant observations in terms of market liquidity (range in the magnitude of 3 % to 6 %)and value in terms of market capitalization(2 % to 4 %) to the value of its assets by their replacement value after adopting international standards and its reporting had become mandatory. Unified international accounting principles may enhance investment across the borders due to increased confidence. It may enhance the ability of forecasting profit rate, which will act as potential opportunity for investors.

If uniform financial reporting standards are adopted, there will be more uniformity, reliability and transparency in terms of information availability in market. It will boost the investors' confidence since overall accounting risk is reduced. As the risk is reduced, investors will accept lower rate of return which in turn will result in a lower cost of capital.As far as accounting risk is concerned, it is related to non-understanding of accounting principles and the possibility that financial reporting standards may not be uniformly adhered to. If accounting information is uniform, consistent and transparent then users can use it for decision making thus reducing overall risk,reducing overall expected returns, reduce cost of capital too.If financial statements comply with IFRS then companies will havemuch better access to world capital markets. The companies can tap the capital from any part of the world having lower cost of capital.In absence of such compliance companies will have to raise capital / debt at higher cost.IFRS implementation would reduce accounting risk thereby reducing cost of equity, cost of debt and thus resultant weighted average cost.

6. Authors' Comments

Post IFRS balance sheet items need to be restated at fair value instead of historical cost. If so restated, it will affect

assets as well as liabilities. It is believed that companies having huge debt will face problems (as most of the telecom companies are having huge debt, which needs to be accounted for at fair value). If these companies have preference share capital, earlier it was treated as a part of equity and now it will be treated as debt, resulting into adverse debt equity ratio.E.g.: Idea Cellular Ltd. in its annual report 2011-2012 has authorized Redeemable Cumulative Non-Convertible Preference Shares of ` 10/- each amounting to Rs. 15000 million against equity base of Rs. 67750 million. If preference capital is issued in future then it would be treated as a part of debt and the debt equity ratio would be affected.

Daske et al. (2008) examined the economic consequences of mandatory IFRS adoption. Their findings are in line with above findings i.e. it has positive effect on marketliquidity, cost of capital, and firm value.

In case of telecom operators in India, there are various intangible assets in their balance sheets. The intangible assets include mainly goodwill, license, and other forms of intangible assets. Thus, for telecom operators, intangible assets play an important part for financial position. Wong and Wong(2005) examined the impact of not amortizing goodwill and identifiable intangible assets with in definitive lives on valuation multiples of New Zealand listed companies. The results indicates significant downward effect on EV/EBIT and PE multiples. Thus a separate study is required to observe effect of above on valuation of telecom operators since intangible assets play an important role.

Capkun et al. (2008) analysed the impact of transition from local GAAP to IFRS in European Union, had a small but statistically significant impact on total assets (including intangible assets), equity, total liabilities.

The implementation of IFRSs would reduce information asymmetry and would subsequently smooth the communication between managers, shareholders, lenders and other interested parties (Bushman and Smith, 2001), resulting in lower agency costs (Healy and Palepu, 2001).

IFRSs also assist investors in making informed financial decisions and predictions of firm future financial performance (Street et al, 2000) and give a signal of higher quality accounting and transparency (Tarca, 2004; Tendeloo and Vanstraelen, 2005). Thus it is expected that financial reporting will be transparent and thus lead to better market efficiency and better stock returns.

7. Conclusions

Based on the various issues involved as discussed above and based on some of the literature as reviewed above, we recommend the following conceptual framework for analysing the impact of IFRS on financial aspects of Indian Telecom Operators:

Accounting Issue	Relevant IAS / Ind AS
Revenue	18
Capacity Transactions	16. 17, 18, 38
Intangible Assets	38
Property, Plant & Equipment	16
Borrowing Costs	23
Impairment of non-financial assets	36
Leases	17
Financial Instruments	39
Provisions & Contingencies	37
Interests in joint ventures	31

8. CONCEPTUAL FRAMEWORK FOR ANALYSING IMPACT OF IFRS

8.1. Limitation and Scope for Further Research

a. This is probably the first attempt to prescribe a comprehensive conceptual framework to assess the impact of IFRS implementation on a specific industry (telecom) within a country (India);

b. This framework presupposes that the “case study” method will be used to analyse the impact of IFRS implementation on selected companies;

c. This framework is based on the accounting issues described in “Accounting Under IFRS: Telecoms”, January 2010 ©2010 KPMG IFRG Limited.

d. The framework needs to be further refined by outlining the relationships amongst the constructs more precisely and comprehensively.

e. A more comprehensive literature review is required.

f. Further research will be required to assess / ensuregeneralizability to other industries / other countries.

Accounting Issues *Arising out of Application of Ind AS / IFRS*		**Financial Aspects**	**Considerations for Assessment of Impact *on Financial Aspects and Financial Decision Making***
1	Presentation of Financial Statements	Qualitative Aspects:	
2	Inventories	Uniformity	Gaining Stakeholder's confidence
16	Property, Plant & Equipment	Transparency	Effect on Stock returns
	Leases	Comparability	Stock market efficiency
17	Revenue	Comprehensive	Market liquidity
18	Capacity Transactions	Global Applicability	Valuation
16, 17,	"	Legal Support	Market capitalisation
18, 38	"	Relevance	Capital allocation
23	"	Faithful Presentation	International capital mobility
31	Borrowing Costs	Verifiability	Access to world capital markets
	Interests in joint ventures	Understadability	These aspects would primarily affect Capital Structure decisions, Dividend decisions, and Measurement of Performance of the enterprise.
36	Impairment of assets	Information	
37	Provisions & Contingent Liabilities & Assets	asymmetry	
	Intangible Assets and		
38	Applicable IFRS		
1	Presentation of Financial Statements	Quantitative Aspects:	
2	Inventories	Revenue	Revenue
16	Property, Plant & Equipment	Expenses	Depreciation
	Leases	Profits	Profits
17	Revenue	EPS	EAT
18	Capacity Transactions	ROI / ROCE	Net worth
16, 17,	"	Depreciation	EPS
18, 38	"	Net Worth	ROI
23	"	Valuation	EVA
31	Borrowing Costs		Agency costs
	Interests in joint ventures		Stock related financial performance measures
36	Impairment of assets		Valuation of Assets
37	Provisions & Contingent Liabilities & Assets		Valuation of Company
	Intangible Assets and		Weighted Average Cost of Capital
38	Applicable IFRS		Capital structure decision
			Capacity to raise debt
			Various ratios
			These aspects would primarily affect financial decisions such as capital structure design, dividend decisions, capital budgeting decisions and working capital management.

GLOSSARY

a. **IFRS –** International Financial Reporting Standards

b. **AS –** Accounting Standards

c. **IAS –** International Accounting Standards

d. **GAAP:** Generally Accepted Accounting Practices

e. **OPBDI&T**: Operating Profit before Depreciation, Interest & Tax

f. **PBIT**: Profit before Interest & Tax

g. **PAT:** Profit after Tax

h. **EPS:** Earning per share

i. **ROI:** Return on Investment

j. **ROCE:** Return on Capital Employed

k. **EVA:** Economic Value Added[2]

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M2M: The Wave at Indian Coast

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Abstract

India, with a large mobile subscriber base and a high penetration rate, has become a conducive market for offering allied telecom products and services other than just voice and data. Machine-to-Machine communication (M2M) is one such area that has gained enormous significance in developed economies over the past decade. With its potential to connect varied devices and make them talk to one another, M2M has found its application over a large spectrum of industries that include Healthcare, Automobiles, Utilities, Security and monitoring systems, Consumer electronics, Logistics and fleet management and Manufacturing.

After being successfully implemented in Europe and North America, now is the right moment to analyze feasibility and fitment of M2M in the Indian market. Nevertheless, India has always been a unique market in terms of its population size, demographic diversity, agricultural background and industrial reliance.

This paper aims at understanding the differences between Indian and global markets with respect to potential benefits offered by M2M. The implementation feasibility, financial dynamics and distinct advantages of M2M in major sectors of Indian economy are evaluated.Sectors such as Agriculture, Healthcare and Utilities that would benefit most from M2M implementation are discussed in detail. The development of entire ecosystem that would come up as a result of M2M introduction would also be analyzed. In entirety the impact of embracing this innovation on the Indian economy is discussed.

Keywords: M2M, M2M Application

India as a market

According to the report released by TRAI in January 2013, the number of wireless connections in India was estimated at 906.62million with a teledensity of 74.49%("The Indian Telecom Services Performance Indicators", TRAI, 2013). The teledensity, apparently quite less than the regional penetration rates of Middle East, north America and Europe, is quite high for a country of the size of India and its per capita income.39.52% of rural India has cell phone connections now and the urban teledensity has surpassed 150%("The Indian Telecom Services Performance Indicators", TRAI, 2013). It indeed is a huge market for telecom operators who are currently struggling to come up with new offering to push their top line revenues and get ahead of competition.

With the current penetration of cellular network and the advent of smartphones the stage is now set for adoption of advanced technologies. M2M communication is one such technologythat would provide consumers with services that would either improve productivity or prove to be a life saver or both. M2M services can be offered across various segments and industries with applications that suit to varied customer needs.

What is M2M

Machine-to-Machine communication is fully automated communication between two machines without any human intervention. Machine 1 collects data through attached sensors and transfer's it to Machine 2 through a network. Machine 2 analyses this information and responds accordingly. The output of the Machine 2 can then be used to derive specific conclusions and sometimes even suggest specific actions to Machine 1. This concept can be extended to connect several machines that can operate in tandem to give the desired outcome. The data transmitted can be intermittent or continuous based on requirements.

A basic example of M2M is the operation of an automated cash dispensing ATM machine. When an ATM starts running out of cash it sends a trigger to a data center through a wired network. A monitoring system then kicks off a signal for delivery of cash. Based on this signal a van with cash receives a message and is dispatched to the desired location with cash. Now, let's assume multiple ATM's sending signals of depleting cash. The data center accumulates all these and tries to locate a certain van that is already in transit to refill the cash. Once this van

receives information about several ATM's to be refilled it finds out an optimum route through a separate tracking system that informs about latest traffic situation. Thus a fully automated M2M system would work in this manner.

For now the scope of this paper we would be to study the possible implementations implementation of M2M applications in India,primarily in 3 sectors: Agriculture, Healthcare and Utilities. Given that India is still a developing economy, M2M in the aforementioned sectors would prove to be a wider impact. on the country

M2M in Agriculture

The agriculture sector engages 53% of Indian population and definitely is the backbone of the country's economy("SOUTH ASIA :: INDIA", The World Factbook by CIA). India's rural teledensity (wireline + wireless) is 40.36, as per the latest TRAI statistics ("The Indian Telecom Services Performance Indicators", TRAI, 2013). Value added services build around weather forecasts, market rates, live stocks, fisheries, health, education and finance are already quite prevalent amongst farmers. Such acquaintance will enable penetration of advanced technology such as M2M easier and acceptable.Key areas in agriculture where M2M can bring in a revolution are: automated irrigation, equipment monitoring and diagnostics, water table monitoring, remote crop monitoring, fisheries, soil analysis, logistics management, market analysis, information sharing and meteorological updates.

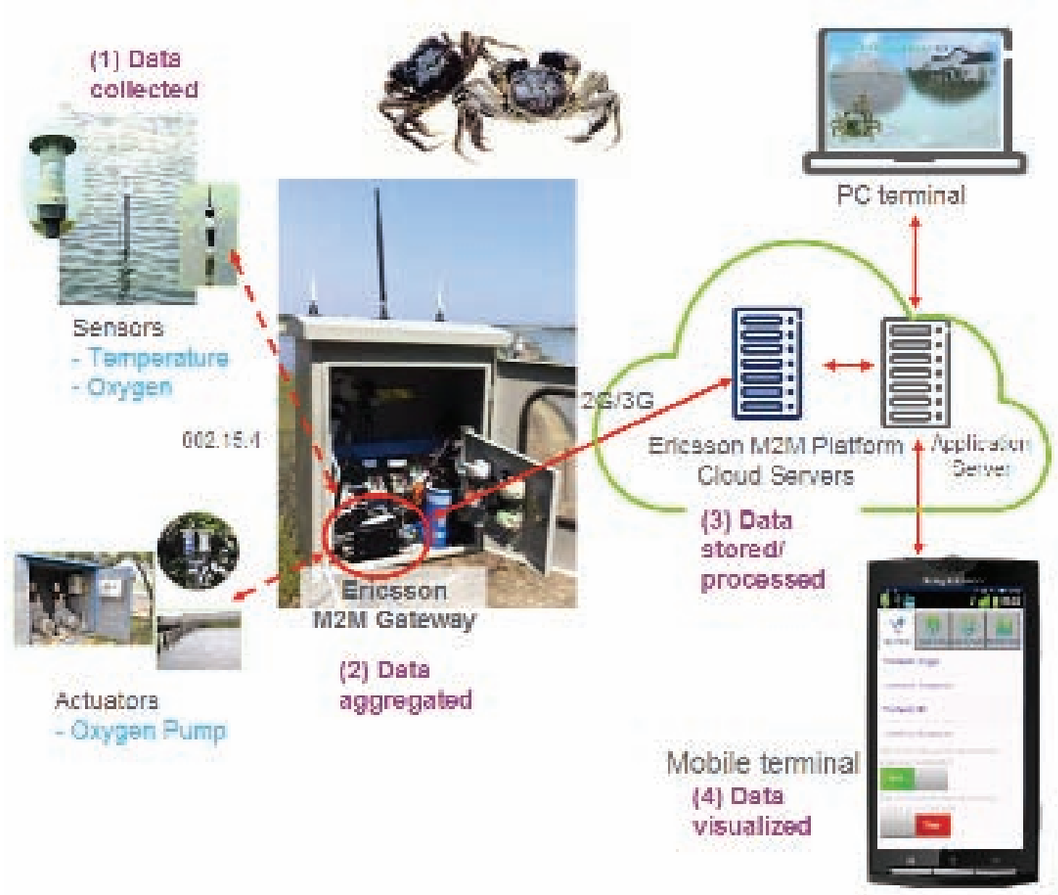
A real time weather monitoring systems can include sensors that are placed in specific geographic locations and the temperature, moisture; rainfall data is continuously collected and sent to a data center. Automated irrigation is one such application that M2M can enable. Implementing an automated irrigation system requires knowledge of several parameters such as: water needs of the farm, water sensitivity of the plants, moisture level, financial factors such as capital expenditures, operating expenditures, availability of power, user friendly technology and many more. Sensors are placed at appropriate distances, throughout the farm that detect moisture level of the soil. The sensors will have M2M units coupled to them that use GSM service to communicate to the datacenter that accumulates processes and transmits information. Datacenter is also connected to another M2M device, with a user interface, through which the farmer keys in the moisture level to be maintained at various parts of the farm, during each farming season. The datacenter processes the feed data from the sensors and decides which part of the farm should be irrigated and how much water should be supplied. The most water deprived part of the farm gets the first priority. The datacenter talks to the pump and pumps the required amount of water to that part of the field. In villages, where the power supply is mostly available in night times, the automated irrigation system works perfectly and avoids the presence of the farmer during odd hours.

Let us also take a look at the "smart fish farming" Project, which Ericsson, together with China Agriculture University, implemented at the Chinese Mitten Crab Breeding Base.

The problem statement is that "Tiny, invisible changes in the living environment are often fatal to crabs, putting crab breeding at considerable risk". It is therefore vital for the farmers to have real-time information of the water quality of their ponds. At the crab ponds, Ericsson engineers have installed a set of water-quality monitoring systems based on wireless sensor network to observe all indicators of water quality, including temperature, acidity and alkalinity, and dissolved oxygen. The sensors will collect and transmit data to the Ericsson M2M Gateway, where the data is aggregated. The oxygen pumps and other water-quality controllers are also connected to the Gateway. The aggregated data is sent to a cloud computing platform, which will then analyze the data, send alarms when abnormal data are found, and give instructions to the Ericsson M2M Gateway that sends appropriate signals to the oxygen pumps and other water-quality controllers, to bring the situation back to normal. Additionally, to facilitate the monitoring of water quality anytime and anywhere, Ericsson has also developed an Android-based Smartphone application just for the local crab breeders. Hence, with the support of Ericsson M2M technologies, local farmers will be able to use their mobile phones to monitor and control the water quality of crab ponds in real-time, and thus lower their energy consumption, save labor, and enhance productivity(Ericsson M2M Solution Supports Crab Farming in China", Ericsson Labs, 2012).

Presently, there is no organized aquaculture for crab farming in India, though natural crab farming is coming up in the coastal belt of Orissa. With the use of M2M technologies mentioned above, scientific crab farming can be made successful in India too. On the other hand, 1.2 lakh hectares are under shrimp farming in India now, spread across 10 states but scientific shrimp farming is still in nascent stages. As there is a number of water parameters such as Dissolved Oxygen, Salinity, water Temperature, pH, nitrite nitrogen, ammonia, Biological Oxygen Demand (BOD), Chemical Oxygen Demand

Figure 1 Ericsson M2M solution supports crab farming in China. Source: Ericsson Labs



(COD), Transparency, Carbon dioxide and Sulphide, to be monitored, implementation of M2M technologies in this scenario is the best act to do. The M2M implementation will take scientific shrimp farming to newer heights and will mark India's place in the global shrimp production market("Fisheries :: Shrimp Culture", TNAU Agritech Portal).The M2M business model for agriculture consists of the key players such as the content providers i.e. agricultural domain experts, the end users i.e. farmers, software providers, service providers and the OEMs. Also, the external players such as the central and state governments, agricultural research institutions and universities contribute to the growth of this business model, in terms of financial aid, research findings and support. All of these forces should work hand in hand, for M2M in agriculture to become a grand success in India.

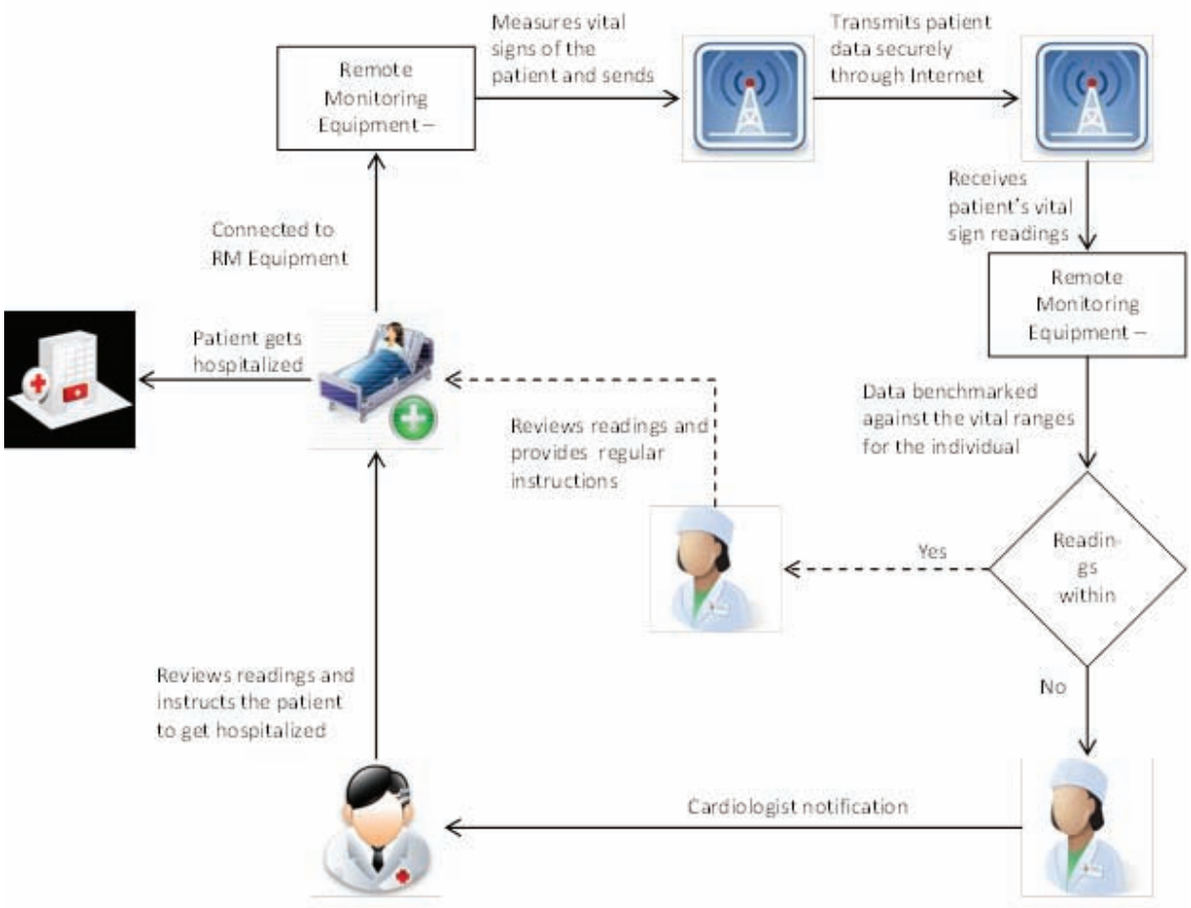
M2M in Healthcare

India as a country presents unique opportunities and challenges, in case of healthcare. Our country is home to 61 million diabetic patients and forecasts show that we will cross the 100 million mark by 2030("One fifth of all adults with diabetes live in the South-East Asia region", International Diabetes Federation Article, 2011)("India's diabetes burden to cross 100 million by 2030", TOI Article, 2011). If that is not enough, cardiovascular diseases result in 25% of deaths annually. Even though it is very difficult to improve these statistics immediately, it is possible to involve technology, such as M2M and thereby, improve the scenario. Devices such as pedometers, sleep sensors, activity sensors and heart beat monitors are gaining popularity in India, as more and more people are interested in building a healthy lifestyle. Some of these devices are integrated directly in the mobile handsets, such as Nokia 5500 Sports Phone and Sony Ericsson W710 walkman phone. These are primarily wearable devices which continuously monitor a specific activity and transmit the data wirelessly, through cellular networks. This data can be appropriately interpreted by the health care providers and relevant action can be suggested. These devices induce enthusiasm and motivate people to be fit.

The next category of services is that of the Remote patient monitoring systems, such as convalescence monitoring, chronic condition and patient parameter monitoring, medication monitoring and activity monitoring. Real-time monitoring systems include monitoring of patient data including foetal heart and maternal contraction patterns, Diabetes patient information management, chronic disease management and Heart health management. The point-of-patient care systems' automated messaging protocols allow case managers to monitor a patient's status, send motivation messages and medication reminders, adhere to treatment plans, and keep doctor appointments, all remotely.

As an example let's consider treatment of chronic diseases done remotely, despite the need forcontinuous monitoring, on a group of 150 patients, at Massachusetts General Hospital (Ambar Kulshreshtha, 2010). In case of remote monitoring for heart patients remote monitoring programs acquire and securely transmit data on patients' HF signs and symptoms to health care teams, alert providers to the early signs of clinical deterioration, and create opportunities for timely intervention. RM also involves patients in their own care and allows them to link behaviors and their consequences (e.g., no adherence to medications and subsequent weight gain). The typical HF Remote monitoring equipment system consists of a Telehealth monitoring system, Automatic digital blood pressure monitoring system, a digital weight scale, blood pressure and pulse rate monitoring system, a pulse oximeter device, to measure the level of oxygen in a patient's bloodstream, telephone service and Internet. Patients, from their homes, monitor their vital signs such as weight, blood pressure, pulse, and pulse oximetry, on a daily basis. The measured patient data are transferred securely via telephone service to the RM nurse. Vital ranges are already established for each patient in consultation with their physician. The RM readings received are evaluated and if they are outside the expected range for the patient, then the RM nurse proceeds with cardiologist notification, referral to the Emergency room, and continued monitoring.

Fig.ure 2 Remote monitoring to help patients with heart failure



In a country where we have 0.6 doctors and 0.9 beds per 1000 people, these systems are real life savers("SOUTH ASIA :: INDIA", The World Factbook by CIA). In remote places where complete healthcare services are yet to reach, the mobile networks have already reached. Hence, these remote patient monitoring systems can be placed in the primary health centers in villages and the information can be sent to the physicians who are sitting miles away. One HF Remote monitoring equipment system can be installed in a Primary Health Center (PHC) in a village, through Government aid. The nurse, who knows how to operate the system and transmit the results, should be present in the PHC. Through telecom service, the results can be sent to the nearest cardiologist in the Government Hospital, who monitors the results of the patients, remotely, and takes appropriate action. In case of symptoms of a worsening condition, the physician can refer the patient to get admitted in the hospital. Thus, the expertise of the cardiologist can be shared with multiple patients remotely and many lives can be saved. Such systems provide benefits such as earlier release of the patients from the hospital post treatment, quick recovery and overall improvement in condition for chronically diseased patients.

All the above mentioned cases advocate clearly for the use of M2M technologies in healthcare, in India, in order to save precious lives. The mHealth ecosystem should bring together medical healthcare professionals, NGOs, pharmaceutical companies, insurance companies, middleware and infrastructure providers, regulatory bodies, telecom service providers, central governments and state governments to deliver affordable healthcare for all, powered by mobile connectivity.

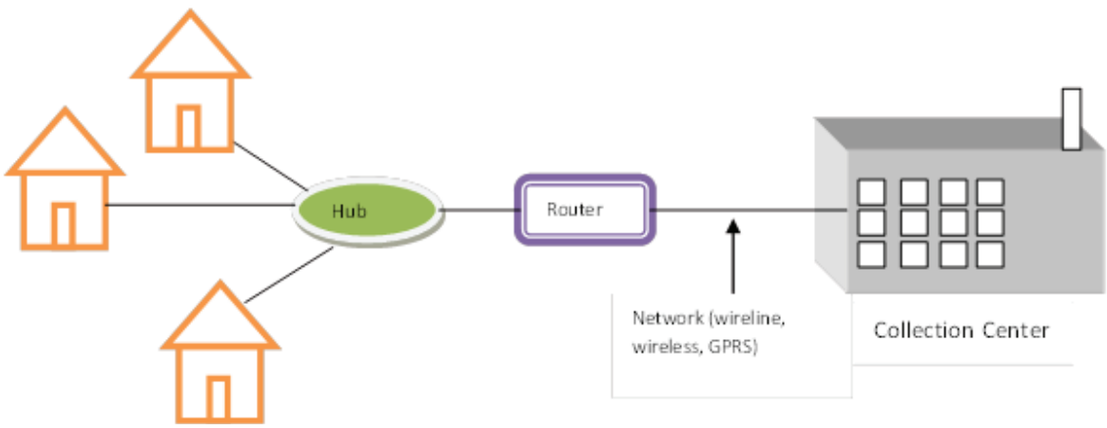
M2M in Utilities

The utility network comprising of supply channels of electricity, water and gas(pipe) that spans pan across the length and breadth of the country. Nevertheless it also means that it is highly exposed to thefts and losses. Moreover, inappropriate distribution of power has left most part of the country without adequate power supply. Rising oil prices shoot up the cost of power and therefore efficient power distribution becomes all the more necessary. Implementing M2M technology in supply of utilities would help curb this to a large extent. Usage of Smart Meters to enable Automated Meter Reading (AMR) is one solution that can be foreseen as the next technological advancement in the Utilities Industry.

A smart meter device combines a state-of-the-art electronic meter with a programmable communications terminal that may interface with multiple networks and devices. Smart grids comprise of a network of smart meters and are capable of doing multiple functions such as load adjustment, demand response support, greater resilience to loading, decentralization of power generation and price signaling to consumers. Smart metering solutions may incorporate a wide range of applications in the fields of remote meter reading, customer relationship management, demand-side management and value added services. (Ryberg, 2011).

Smart grids allow remote monitoring of utility supply and allow moderating the same. Smart grid has the capability to continuously read the demand and supply situation of power for a particular geography where it is installed. At times when power required rises it reroutes excess power from some other grid and vice versa when power requirement reduces. During equipment failure a smart grid detects them and contains them to avoid a major black out. On the consumer side the grid gives a continuous update of energy usage. Going further it is likely that technology would be available to know the energy usage by device/appliance in the house

The present day problems with collecting accurate reading, calculations, billing, problem detection can be



easily mitigated with the implementation of smart meters. Remote meter reading technology enables data collection without visiting the physical location. This allows, metering system operators to collect meter data with higher quality, more rapidly and using less manpower. Remote meter reading may also comprise multiple utilities. Most households have several utility meters, e.g. for electricity, gas, heat or water. If they are all connected to the same communications terminal, the benefits of remote meter reading can be shared among several utilities operating in the same area. Last but not the least smart grids can seamlessly integrate with renewable energy sources that can serve as a back up power source.(US department of energy)

The government of India has initiated 14 pilot projects for smart grid implementation and the success will largely determine further rollout(Power ministry of India). To make smart metering a pan India success an overhaul of the current system is required which in itself is a monumental task and would take years to accomplish.

Feasibility Study

A typical M2M value chain is depicted in the diagram below

It is evident from the above value chain that telecomoperator's and service enablers (companies that offer the service to customers) are only the only two players that can actually take a lead in offering M2M. Even if they do so, the entire ecosystem has to be first developed and then evolve so that offering M2M in any vertical becomes feasible and later on profitable. Huge investments have to be made on infrastructure, application development and manufacturing of devices by various stakeholders. There are devices that enable M2M, the sensors, chips, wireless or wireline connections, the platforms, payment gateways, service provisioning, software development and integration services. All this has to be undertaken simultaneously in order to achieve end to end operations.

Key challenge in offering M2M is uncertainty about the demand and therefore the expected ROI. Moreover the partnership and revenue sharing models are still under investigation. Debate still exists over how the business model should be and which stake holder receives how much share of the revenue generated. Another challenge that any provider would face is the low ARPU of the services offered. Therefore for sustainable business it has to achieve significant economies of scale which still seems to be a daunting task.M2M connections can be offered only in geographies that are connected by wireline or wireless communication. All these things demand lot of due diligence before anyone venture's into the M2M space.

In the Indian context the price of service is a critical factor to consider while entering the market. Educating urban and rural consumers is equally important to facilitate adoption. Impact to the society and profitability of the business hasto be analyzed. If implementing in rural India uninterrupted connectivity has to be ensured and this may invite additional infrastructure investments. There are rural areas in India that are yet to come under the coverage of an operator and therefore agriculture based services of M2M cannot be offered in such areas. In areas where these systems can actually be offered it has to economical. For being economical it has to achieve the scale that is needed. All this looks quite challenging.Government has to step in and incentives such as tax breaks have to be offered to operators who offer rural India. An overhaul of the utilities network although sounds attractive has challenges to cost, ownership, return on investment and perceived benefits. In healthcare the life saving remote monitoring system would not come for a low cost. Educating the masses of its perceived benefits and then its usage is also going to be an arduous task. Penetration of such system will again remain an issue until it becomes cost effective. Till then in areas where basic healthcare is unavailable adoption of M2M still remains a dream

Thus, M2M implementation in the country doesn't come without certain challenges that early entrants will have to face. But early entrants also stand with a chance to capture the market once successful. Everything said, M2M still tops the to-do list of most operators merely because of the potential it has to unlock unattained revenues in an entirely new space. Time has arrived for an emerging economy like oursto put a foot in the right direction and move towards M2M adoption. It is an innovation of the future and a trump card that can get an organization ahead of competition and also aid the country's development at the same time.

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Next Generation Revenue Assurance

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Abstract

In the increasingly competitive and fast-moving telecom environment, Mobile Network Operators are encountering a greater number of challenges to maintain their revenue. With eroding margins and looming cost pressure Telco's are facing great threats of long term sustenance, scalability and vulnerability toward revenue leakages.

The need of hour for Telco's is not only to monitor each and every billable transaction to retain and cover revenue, but also perform root cause analysis and provide strategic solution to the problems. This is where Next Generation Revenue Assurance (NGRA) comes into picture, which gives thorough results after incorporating business analytics and advanced analytics like analytic profiles and neural network models.

NGRA is facing challenges when it comes to the advancements and penetration of smart phones, enhanced internet connectivity, next generation mobile interaction, rising capex/opex and flat lining revenues. Besides these regulatory compliances, skilled manpower, handling high data volume and need of technology agnostic solutions are also the major hurdles in its path.

The next generation technologies have created a market place for NGRA to evolve. Next generation leakages, integration of RA and fraud management systems, advancements in processing and storage, mobile security risk management will drive NGRA. NGRA implementation would require Telco's to optimize their business strategies, processes, administrative structures and infrastructure. A successful implementation would be based on managed services, software as a service (SaaS) and RA consultancy.

NGRA will provide strong support to expose hard to detect leaks, increase productivity and ROI, lower total cost of ownership and will give bird's eye view of entire revenue chain. It will help Telco's in accelerating their decision making process and implementing go to market strategies.

Keywords: Revenue Assurance, Next Generation Revenue Assurance, Fraud Management

1. Revenue Assurance and Fraud Management in a nutshell

RA (Revenue Assurance) as a proactive BSS (Business Support System) practice of accurately reconciling the complete billing lifecycle from switch to bill generation and dispatch, minimizing bad debts and recovering revenue. RA is the process of ensuring all billable transactions are executed, rated, billed and collected correctly in a timely manner. In short, this is the assurance that maximum revenues are realized and that a product, customer, or operation is not losing money.

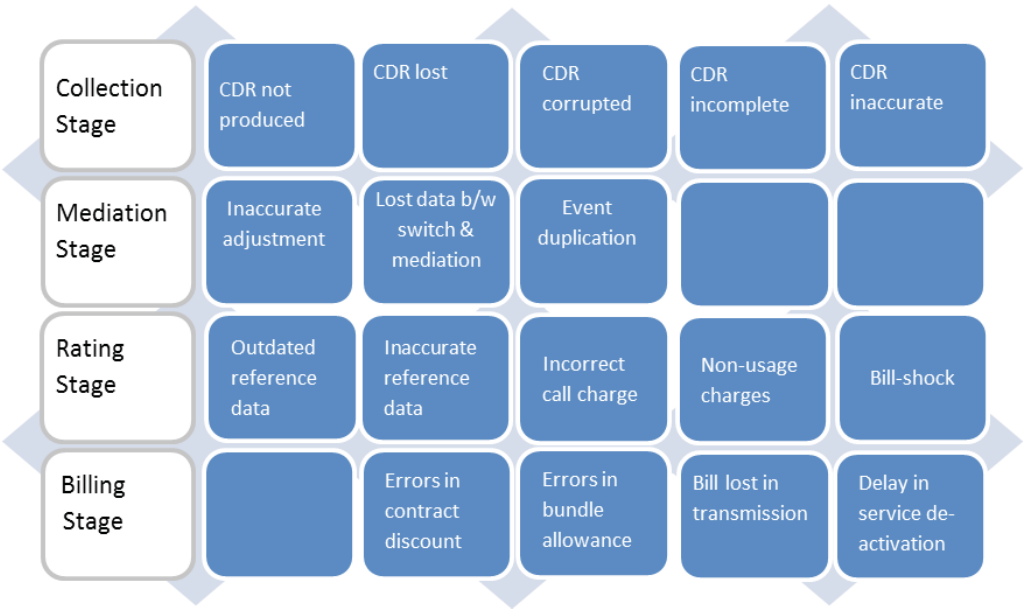
Fraud in an essence is a well-organized business and a criminal activity involving deliberate deception to a service or product illegally for financial or personal gain. Unlike RA, fraud is a non-recoverable loss. Cellular Service Provider limits such risks by installing a system to monitor and react to criminal activity in real-time, continuously feeding-back new rules and thresholds to minimize the threat of the event reoccurring in the future. Fraud management teams are concerned with individual cases and demographic-based data for identifying the location of criminal activity, the perpetrator involved and analysis of behavioral profiles.

2. The Threat of Leakage – A big issue

2.1. Revenue Leakages

At each point of the transaction there is a potential for a revenue leakage in the switch-to-bill process, from network, mediation, to billing, as well as those related to collections and dunning, provisioning and customer-service and product development. There can be a number of reasons that lie behind a leakage; these include poor order accuracy, incorrect client data within the system, incorrect service provisioning or process inefficiency and

Figure 1 Revenue leakages at various stages.



can take many different forms. In terms of mobile content commerce, a revenue leakage may be incurred as a repayment where there has been an incomplete download or non-delivery of purchase. A leakage can occur in equal measures for both pre-paid and post-paid accounts. Another cause of leakages may be the lack of cross-organizational standardization of KPIs, which undermines a broader business objective of cash-flow maximization. Leakages tend to occur predominantly earlier in the sales process whilst only detected downstream later in the customer-to-cash lifecycle.

2.2. Fraud Based Leakages

Unique to each case, it is almost impossible to classify fraud, often resulting in unconstructive over simplification. Instead, classification is based on the types of products and services that are stolen and then sub-classified by access points. Some commonly known frauds are listed below.[1]

- **Subscription Fraud** - Subscription fraud occurs at the activation stage; it is the act of gaining access to a product or service without having the intention to pay.
- **SIM-Cloning** - Hacking the ESN (Electronic serial Number) and making the two phones identical to the operator and resulting in charges made by the fraudster being billed unknowingly to the original, legitimate account.
- **Interconnect Bypass Fraud** - Having acquired a SIM (Subscriber Identification Module), a fraudster may attempt to bypass such interconnections, routing calls onto or away from the MNO's network, rather than generating interconnection terminated calls, by using cheaper, unauthorized routes such as VoIP (Voice over Internet Protocol).
- **International Call Bypass** - This is the act of placing off-net calls onto an operator's network but avoiding international gateway to evade the international inter connect charge.
- **PRS Fraud** - Having acquired network access, the subscriber might procure content or services charged at premium rate, such as chat-lines, television vote-lines, gambling, horoscopes, ringtones and logo downloads, charitable fund-raising lines, sports results and directory enquiry services with the intention of not paying for them.
- **Roaming Fraud** - Roaming fraud is the use of an operator's network outside the user's home country, wherein there is no intention of paying for calls made.
- **PABX (Private Area Branch Exchange) Hacking** – Through intelligent code-breaking ac-

Figure 2 A holistic view of frauds in Telecom Industry

tivity, fraudsters gain access to a company's IP-based switchboards (PABX) to make unpaid calls or other revenue generating frauds such as PRS fraud; illegitimate usage then appears on the company's bill.

- **Internal Fraud** - Due to detailed knowledge of the system and processes, telecom employees are ideally situated to attack the network at any point, abusing their permissions and access levels.
- **Dealer and Supplier Fraud** - Dealer fraud is the any activities performed by the dealer or supplier with the intention of depriving the MNO of revenue whilst increasing their own commission by abusing the terms and conditions of the contract.
- **M2M (Machine to Machine) Fraud** - This involves criminals tampering with SIM embedded devices to illegitimately obtain mobile services.
- **Malware and SIM Hijack** - With the rise of smartphone devices, the use of mobile malware and SIM hijack is undoubtedly on the increase, enabling fraudsters to acquire personal information and network access, running their bills to others' accounts and increasing illegitimate network data volume.

3. Contemporary Mobile Eco-System – The challenges faced:

3.1. Enhanced Internet Connectivity

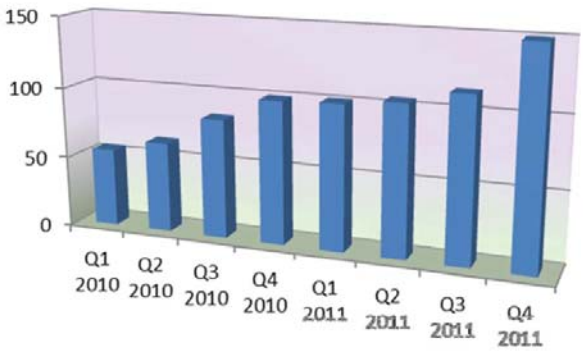
The surge in popularity of mobile transactions has indubitably been driven by the development of national UMTS/HSPA/3/3.5/4G networks in concomitance to the increasing availability of Wi-Fi, stimulating accelerated mobile device adoption and enhanced usage.

Yet whilst improved connectivity is enabling critical revenue channels, the availability of multiple access points presents a number of security risks wherein it is difficult for the operator to ascertain ownership of the network and identify a consumer given that their IP location is constantly changing. The MNO must additionally rely on a number of third-parties to support network operations such as roaming and interconnect partners or other MVNOs (Mobile Virtual Network Operators).

3.2. The Advancement and Domination of Smartphones

The evolution of the smartphone device has revolutionized the mobile technology market, fundamentally transforming consumer behavior. Equipped with MP3 playback, cameras and gameplay also combined with the facility to download apps, consume popular content and share user-generated content, fundamentally differentiates smartphones from non-smartphones. The rise in smartphones reflects a global shift which is increasing the level of data volume encountered by MNOs on their network as they engage with a number of other industries to provide value-added services beyond simply voice and data.

Figure 3 Global Smartphone Shipment Volumes (million) over Q12010 - Q42011 – Source: Juniper Research[2]



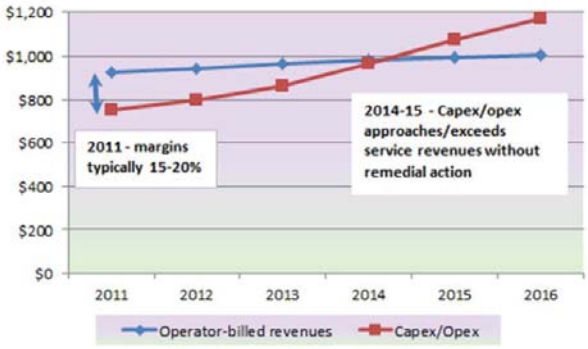
3.3. Next-Generation Mobile Interaction

The subsequent convergence in communications and internet computing has interconnected a broad range of industries positioning MNOs at the intersection for delivering next-generation connectivity and content. Consequently, RA and fraud management systems must further take into account whether offers and incentives are being realized with external parties. This has led to enabling 24/7 connectivity, encouraging new ways of communicating, reading, watching videos, banking, managing health and so forth. This is resulting in an inexorable growth in the wireless data traffic needing to be absorbed and processed by the mobile network.

3.4. Flat lining Revenues, Rising Capex, Rising Opex

MNO subscribers are expected to increase while on the other hand global ARPU is expected to decrease consistently as seen and forecasted based on previous trends. Revenues plateau, costs (both capex and opex) are rising. To meet the demands of consumers, MNOs must upgrade their networks to offer 3.5G and 4G services, thereby paying both for new spectrum and new infrastructure: during this transition (and beyond) they must cope with the surge of traffic endangered by the consumer smartphone boom, which has implications both from a network congestion and cost perspective.

Figure 4 The 'Nightmare' Scenario: Global MNO Service Revenues vs. Capex/Opex ($bn) 2011-2016 – Source Juniper Networks[3]



4. An Evolving Marketplace for Next Generation Revenue Assurance:

4.1. Next-Generation Leakages

Revenue management is becoming increasingly more challenging as MNOs move towards next-generation services and content provision, ineluctability increasing the incidence and nature of business risk. The proliferation of new data services has increased the incidence of billing problems with frequent additions and alterations

in offerings, new and additional billing systems, unfamiliarity with an event and content-based billing and converged billing systems. Operators will need to adopt greater real-time functionality for responding to fraudulent activity by being able to monitor and identify a typical usage behavior from a provisioned SIM card.

4.2. Tiered Data Pricing: a Billing Headache?

In order to better monetize their networks and data services, MNOs are moving away from unlimited data packages for a fixed price; such plans tend to render the network vulnerable to heavy bandwidth consumption, high volumes of data and therefore leakages, with operators gaining no more incremental revenue. Instead, using online charging and policy, operators are now able to offer tiered-service and value-based price plans and personalized packages that better corresponds revenue to consumption, usage patterns and in some cases, quality of service. As a consequence of the smartphone revolution, MNOs have significantly expanded their portfolio of available cell-plan packages resulting in mediation teams struggling to ensure correct billing and rating.

4.3. Integration of Revenue Assurance and Fraud Management Systems

The Telco's are observing a considerable level of integration between RA and FMS functionalities by exploiting technical synergies. Such a development is in recognition that the two areas are partly related and complementary given that both teams require the same billing, customer and usage information. MNOs are seeking greater cross-domain cooperation facilitated by capabilities such as case-management, allowing both teams to work together on cases and share reports to gain a greater cross-organizational review.

4.4. Formalized Business Perspective

Over the past two years, RA has moved significantly towards a 'formal risk management process'18, wherein operators are adopting an objective approach in identifying new revenue streams to be incorporated into the RA reconciliation process and their importance for generating a vast quantity of transactions and cash-flow. This has involved greater leverage of business intelligence capabilities that is allowing operators to integrate dedicated and proactive modules within their BSS to pre-empt network threats.

4.5. Advancements in Processing and Storage

Driven by cross-industry collaboration, the rate of technological innovation in hardware and software has been dramatic. Earlier an installation based on hard-disk technology might process on average 100 million events a day. Today; however, leveraging multi-core processers and SSDs (Solid State Drives), an average CPU is capable of running 600 million events per day. Similarly, there has been an improvement in data storage capacity, speed and costs. Vendors are now also offering cloud-based solutions: large, distant server farms providing virtual, online storage and hosted by a third party, accessible from various geographies which is becoming more attractive.

4.6. Mobile Security: Managing Risk in a 4G/LTE Environment

Moving into a 3.5/4G telecom environment, end-point and network security are becoming increasingly challenging, compounded by the accelerated adoption of smart devices and new technologies that is allowing consumers much greater control over the service than they did in the past. This new complex reality has engendered a level of co-ordination and integration of system security applications within the Revenue Management solution.

4.7. Cross-industry Co-operation and Re-Sale

As MNOs attempt to secure their end-to-end revenue stream more tightly and manage an expanded ecosystem, some vendors are increasingly observing that an MNO will purchase a RA and FM solution and re-sell or promote it to their dealers and content providers. This is part of a collaborative strategy to inhibit system after-shock and prevent leakages from a source point, bearing critical imperatives not only in terms of revenue, but costs, margins and company reputation.

5. Business Strategies for Next Generation Revenue Assurance:

5.1. Ensuring Effective Business Assurance

By exploiting a single repository of data, for optimum business performance, the RA and FM components should be able to easily integrate with and support other

mutually-beneficial BSS components such as margin assurance or customer experience management as well as OSS elements such as network management for complete Business Assurance.

5.2. Ensuring Next Generation Revenue Assurance Automation and Flexibility

Broadly, the automated infrastructure should be scalable enough to process large volumes of data from multiple sources, rapidly and accurately in real-time that can visibly improve time of resolution. Additionally, the solution should be flexible enough to integrate new internal and external data streams easily, ultimately providing complete visibility of the revenue-chain.

5.3. Optimizing the Administrative Structure

Telco's must distribute revenue management responsibilities strategically across the organization, creating a balanced organizational structure. Prioritizing improved inter departmental communication will increase the amount of available intelligence, improve end-to-end visibility and subsequently support the realization of high-level metrics that can facilitate co-ordination. RA and FM teams must be sufficiently educated and keep a-pace with the ever-altering threat environment provisioned with the correct skill-set and relevant experience.

5.4. Optimizing the Business Processes and Leakage prevention

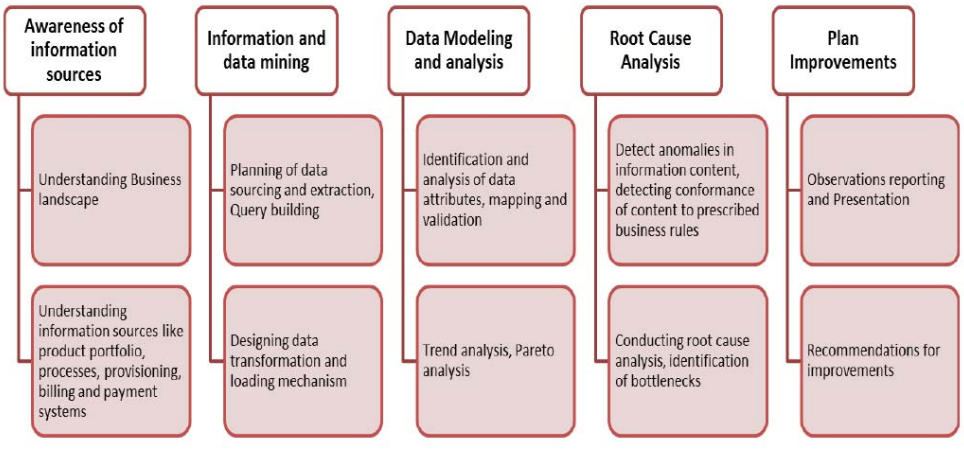
Not all revenue leakages can be predicted meaning it is essential to have a proactive component that can capture a problem by applying rule and profiling logic, combined with subscriber information. Yet if this component fails to identify the threat, the system should transform it into a proactive rule to be fed back in to the system having been captured at the reactive level. Having analyzed the structure of behavior, the system can then stop the problem almost immediately if it should occur again.

Prevention requires systems ascertaining the root-causes of revenue leakages. Adopting a prevention based strategy involves the use of case-modeling: a drill-down analytical process that is refined further to system modeling for investigating the logical system architecture, service design and data object or subject.

5.5. Optimizing Infrastructure for Next Generation Revenue Assurance

The infrastructure should be lightweight and modular-based to allow CSPs to add and detract applications, solving the most critical challenges first and proceeding strategically using a flexible, scalable and cost effective approach. Furthermore, the infrastructure should be self-learning, able to continuously feedback and integrate new rules to proactively secure the system.

Figure 5 Business Analytics Methodology in Telecom Revenue Assurance[4]



6. Next Generation Revenue Assurance - Advanced Methodologies

6.1. Analytic Profiles

Advanced profiling capability enables it to profile the behavior of customers. Unique profiles are automatically learned and maintained for each and every customer, and continually evolve to reflect a customer's normal behavior. In this way any anomalous and unusual activity is flagged up for investigation.

6.2. Business Analytics

Business Analytics approach helps support business with process re-engineering, re-organization initiative and large transformation initiatives by providing predictive analytical metrics and recommendations.

Below diagram illustrates Business Analytics.

6.3. Neural Networks

Neural Networks look at the nonlinear interrelationship between thousands of data points at a time. Powerful pattern recognition capabilities enable to recognize them subtle, hidden and emerging patterns of revenue leakage across the networks. The Neural Network models are trained on actual data to spot these complex data driven variable patterns associated with revenue leakage. As a result Neural Network based systems detect problems that providers don't even know they should be looking for.

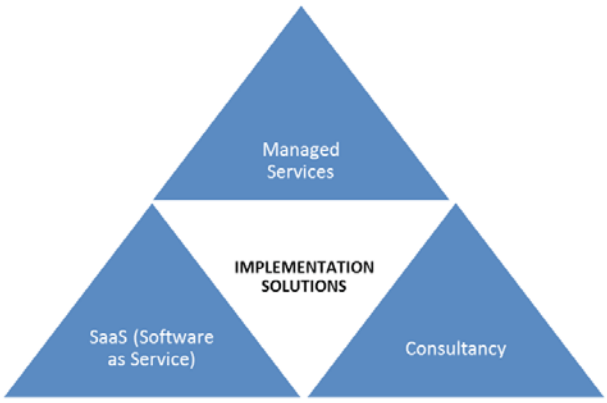
E.g. **Tromboning**: Neural Networks can detect revenue leaks from "Tromboning" by determining when the number of hops with interconnect carrier is unusual and inappropriate given contemporaneous network conditions and events.[5]

7. Implementation Solutions for Next Generation Revenue Assurance

7.1. Managed Services

Managed services involve a third-party ASP (Applications Service Provider) taking complete control of the full RA and FM process tailored to the MNO from implementation to deployment, followed by system maintenance and upgrade. The solution includes IT infrastructure, application management and business operations. Utilizing its own technology platform, the vendor is able to provide industry-level, domain-specific expertise with well-developed product expertise and well established processes. The vendor makes available a ready trained team to be rapidly deployed and rigorously managed, able to exploit the full capabilities of the IT platform. The solution can offer greater accountability by embedding strict, industry standard KPIs and SLAs (Service Level Agreements) reinforced by best practices and processes.

Figure 6 Implementation Solutions



7.2. SaaS (Software as Service)

An on-demand service, this is the renting of technology infrastructure from a third party wherein the Cloud can either be deployed on-site or hosted centrally via the vendor. An on-demand cloud-based solution can provide for the smaller CSP as an easy-to-use, pre-configured, software solution based on their data and fully web enabled and secure. Such a solution requires minimal capital outlay, low subscription feeds, no need for a dedicated infrastructure and no on-going maintenance charges. Instead software upgrades are automatic, integrated into the hosted platform. The offering provides for real-time data processing, intuitive user interface, built-in tutorials, online community support and robust alarm management, workflow and reporting.

7.3. Consultancy

Consultancy services enable customers to be able to focus their efforts in a particular area where is necessary by providing up-to-date, relevant industry expertise. The process of consultancy is to demonstrate value-adding services and to realign the RA and FM teams mind-

set to a formalized risk management perspective rather than a short-term fix. Essentially, the vendor takes a risk assessment of the CSP environment and recommends appropriate solutions. Indeed, consultants are able to assist CSPs to sort through vendors and construct a system with specific functionalities purposeful for their organization aligned to cost structures. This might be a more applicable solution in developing markets where operators cannot afford to put in a fully-fledged RA and FM system.

8. Conclusions and Strategic Recommendations

Clearly, revenue leakages cannot be reduced to zero; this is the hard reality that Telco's must accept while operating in an innately risky environment. As we move rapidly towards 4G/LTE connectivity, the volume of revenue leakages is set to accelerate yet more dramatically with operators having to manage an extended, more complex revenue chain and to incorporate data from multiple internal and external sources.

Some of the remedial measures to establish a 360-degree, customer-centric perspective of the business and e2e visibility of the revenue chain would be acknowledging that loss can occur at any point within the transactional life cycle. Fundamentally, this begins with implementing an automated revenue assurance (RA) and fraud management (FM) system that replaces manual processes no longer able to manage the expanded volume of cellular network traffic, particularly from data services.

Some of the strategic recommendations are listed below:

8.1. Operators Should Deploy a Single Technology Platform

Given that both RA and FM utilize the same data, operators can and should deploy a single technology platform that enables both sets of operations.

8.2. The ETL(Extract Transform and Load) Platform Should Allow Real-Time and Near-Real Time Analytics

The ETL platform should operate in both real-time and near real-time to continuously extract data, transform it for operational requirements and load it into an end-storage to be made readily accessible to analytics. The infrastructure should be self-learning, able to continuously give feedback, to integrate new rules and to proactively tighten the system.

8.3. The System Should be Flexible

The infrastructure should be lightweight and modular-based to allow CSPs to add and detract applications, solving the most critical challenges first and proceeding strategically using a flexible, scalable and cost effective approach.

8.4. The System Should be Self-Learning and Intuitive

Whilst systems must necessarily be reactive, as they mature they will become increasingly preventative by applying rule and profiling logic, combined with subscriber information. E.g. using predictive analytics and neural networks.

8.5. The Business Support System Should Enable 360 Vision of The Business by Integrating Complementary Business Applications

It is insubstantial to simply have standalone RA and FM systems operating in independent silos. Instead, there should be greater cross-departmental communication for realizing broader business objectives that align revenues with costs and margins, enabled by KPIs.

8.6. Operators Should Adopt a Formalized Risk Management Approach

The telecom industry often operates in an ad-hoc fashion, reacting to the 'latest', so-called threat rather than maintaining consistency. Through cross-industry cooperation, operators should assume a more formalized risk management approach.

8.7. RA and FM Teams Should Collaborate with Mobile Security Teams

Handling large volumes of sensitive data, operators should seek greater co-operation with mobile security vendors that can protect the network infrastructure and

the end-device, allowing comprehensive and mutually beneficial risk management.

8.8. Operators Should Enlist Consultancy Services to Select an Optimal Solution

All operators should engage consultancy services as a critical component of the process. Consultants can assist in enabling more focused investment by undertaking a risk assessment to recommend appropriate action and to construct a system with specific functionalities purposeful for their organization and aligned to cost structures.

8.9. A More Customized Solution and Greater Responsibility Over the System will Increase the ROI

The greater the level of customization, the greater the ROI; the most successful implementations tend to be those where the operator takes complete or near-complete responsibility of the implementation and configuration of purchased-system. This enables greater alignment of product with the operator's specific business processes and objectives, giving them greater control and improving productivity.

8.10. Smaller MNOs Can Reduce Costs with Outsourcing Options

Given the initial high costs involved, smaller operators should begin by outsourcing a large proportion of the solution to a third-party vendor with the competencies to implement a system immediately.

9. Glossary

NGRA	Next Generation Revenue Assurance
RA	Revenue Assurance
FMS	Fraud Management System
ETL	Extract Transform and Load
MNO	Mobile Network Operator
ROI	Return on Investment
CSP	Cellular Service Provider
KPI	Key Performance Indicator

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An Overview of Indian VAS Industry: Regulatory Perspective

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Abstract

The Telecom Regulatory environment of India seems to be promising after the approval of NTP 2012 by the Union Cabinet. One can look at things afresh regarding Indian telecom sector which is one of the fastest growing markets at an expected growth rate of 10.6%1& contributing to around 3%2 of Indian GDP. With a huge subscriber base of around 930 million3, unprecedented growth in teledensity& fast mobile penetration, India Inc presents itself as one of the lucrative options for investment.

However the flip side of this is the complex regulatory framework, policy paralysis, mismanagement of funds & lack of government initiatives. This can be substantiated by the facts like cancellation of 122 2G licenses, fixation of reserve price in 1800 MHz band at a staggering amount of 14,000 crores for a mere 5MHz block,uncertain future of the numerous foreign players like Telenor, unjustified revenue sharing model towards the VAS players, uncertain roaming agreements & inefficient allocation of spectrum.

The end customers are the only stakeholders in the entire telecom ecosystem who have to bear the brunt as the cost gets ultimately passed on to them.

VAS industry is one of the key areas facing the unending loop of uncertainties & lack of recognition by the government. This paper primarily deals with the critical analysis of its current scenario, bottlenecks& their impact followed by recommendations & underlying future opportunities to revive its growth.

Keywords: VAS Industry, Telecom Regulations, Telecom Policy.

1 Economic times
2 TRAI Consultation Paper on MVAS, 2011
3 VOICE & DATA

1. Regulatory Scenario of VAS Industry

The $ 68.81 billion[1] dollar telecom market with an annual growth rate of 12-13%[2] has reached the maturity phase thanks to the stagnating revenues from the commoditized voice market.The market was expected to get rejuvenated through the introduction of 3G & 4G-LTE services by changing the landscape of datadelivery & user experience but failed to get realized.

Post the Supreme Court judgment about license cancellation, the telecom regulatory environment seems to have got entangled in a vicious circle of uncertainties leading to an impregnable status-quo which is driving the market nowhere.

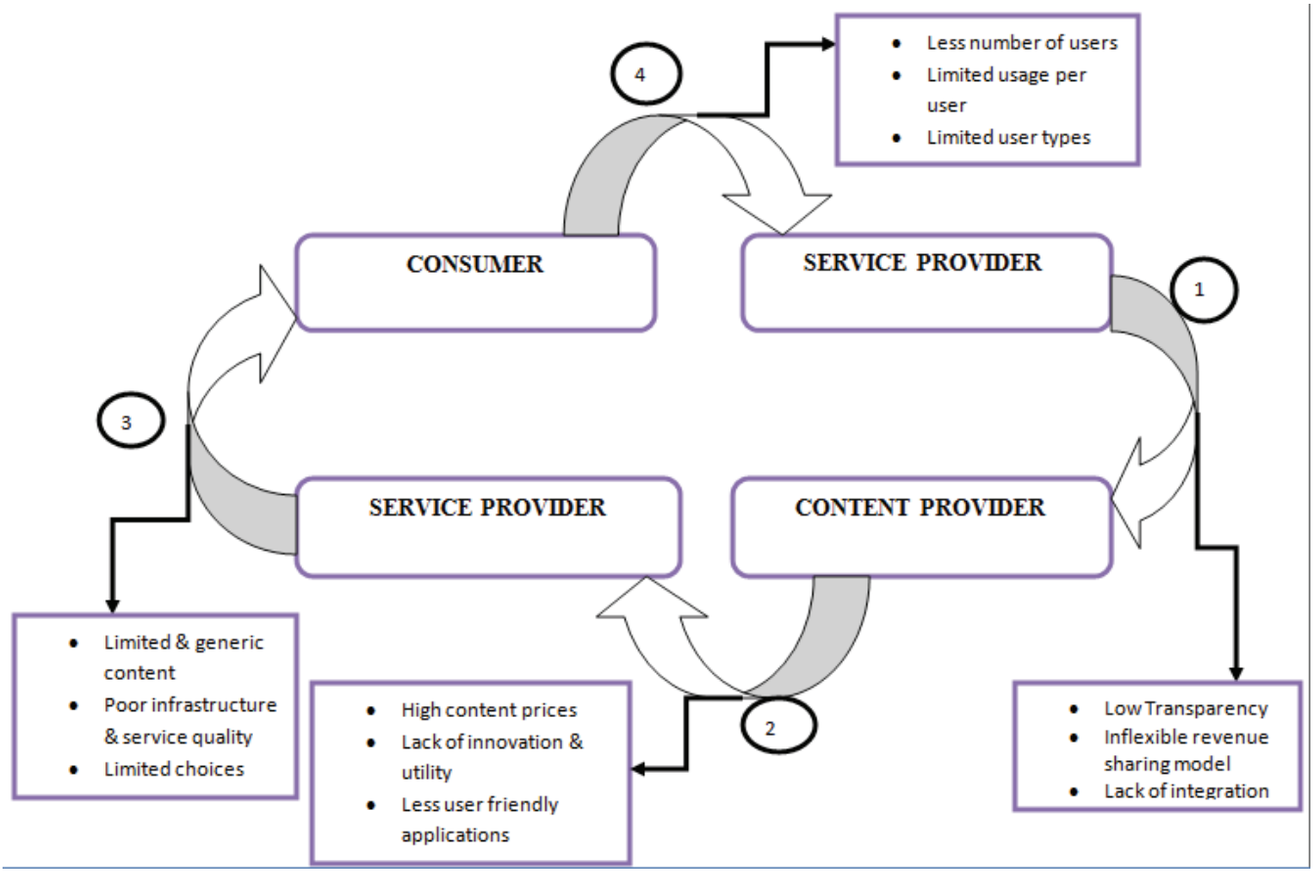
In the meantime, the ambitious NTP-2012 got a green signal from the government & it discusses about "putting a regulatory framework for VAS to ensure its delivery at affordable prices & promote innovation, entrepreneurship & provision of multilingual region-specific content" (NTP, 2012, p.12).

The Indian VAS industry which is currently at a nascent stage is expected to reach $15 bn by 2015[3]with mobile penetration expected to reach around 100% by 2015[4]. The next hope for growth comes from data services & VAS plays the role of a prominent growth catalyst.

However it currently contributes only around 15%[5] of total operators' revenues against the global average pegged at approximately 23%[6]. In spite of the rollout of 3G services & BWA, the uptake of VAS is very poor

1 Business Review India, 2012
2 Voice & Data
3 Voice & Data
4 Trai
5 Voice & Data
6 Assocham-Deloitte Study, 2011

Figure 1: The Vicious Circle of VAS Industry



Source: IAMAI

due to numerous challenges spanning across regulations, ecosystem, innovation, pricing, customer awareness etc.

The telecom regulations don't specifically define the guidelines related to value added services & the guidelines have been prepared with the Telecom Operator considered to be responsible for the conduct of the VAS provider as there is no provision of VAS license as of now. This is one of the key factors that are acting as hindrances in driving the growth in the VAS industry(MVAS-TRAI paper, 2010).

The following figure explains the impact of uncertain regulations on the stakeholders of the VAS ecosystem which is like an endless "vicious circle" where each issue follows the other.

1.1. Current Market Scenario & Challenges Faced- The "Vicious Circle of Uncertainty"

1.1.1. Lack of Recognition & Government Initiatives

There are no specific & uniform provisions for VAS among the licenses like UASL, CMTSand ISP

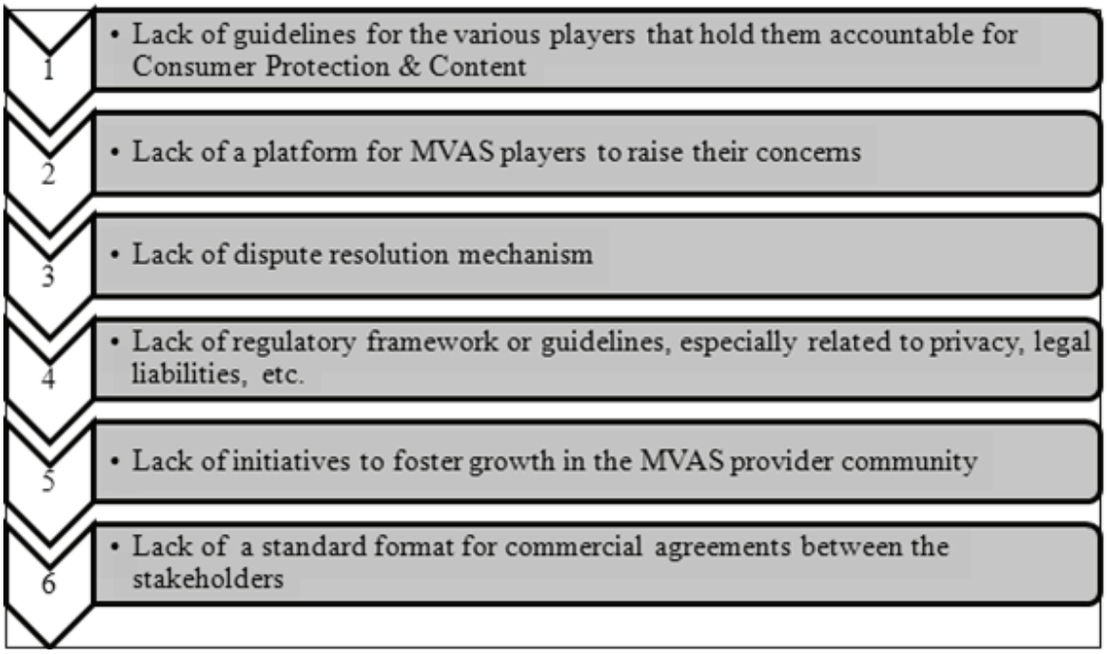
The main issues are:

1.1.2. Over-dependency on the "Low Hanging Fruit"

The consumption of VAS is primarily driven by entertainment & information VAS like CRBT, astrology, bollywood, SMS alerts etc. There is hardly any innovation& utility in terms of content & regional variety in areas like m-commerce, m-health, m-agriculture which can digitally empower the people through inclusive growth & access to basic information (Kale, S., Bhandari, L. (2008). MobileVAS-IAMAI).The market is thus characterized by the predominance of generic content as the costs of development; digitization & conversion are low.

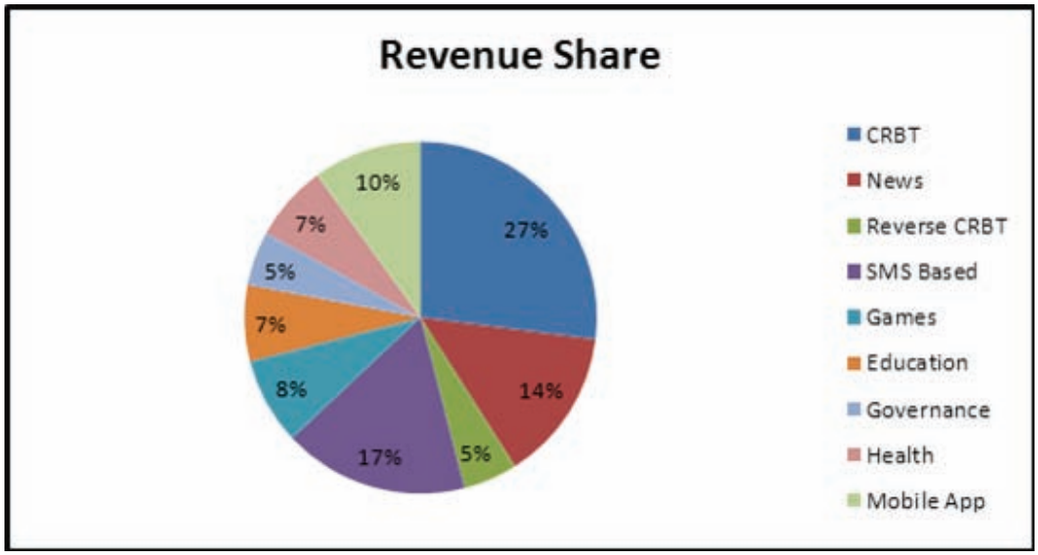
Also the operators don't adequately distinguish between the types of content thereby applying standard rates on all & they hardly provide performance based reward models

Figure 2: Issues Related to Regulations



Source: TRAI

Figure 3: Revenue Share Break-up for VAS



Source: IAMAI REPORT 2012

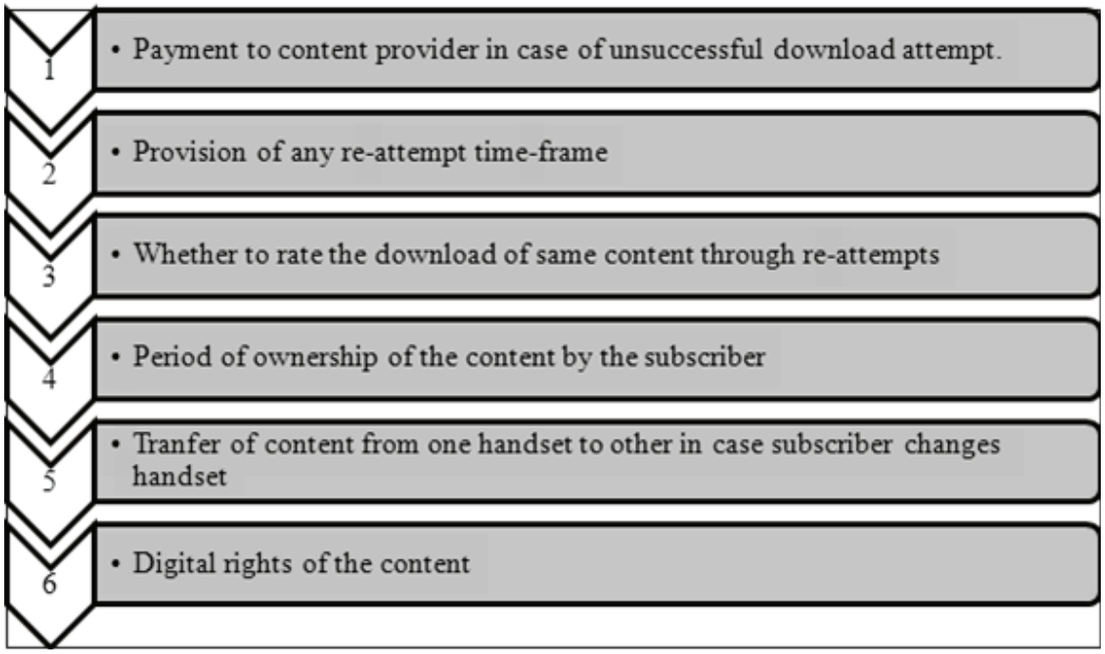
which lead to opaqueness.

1.1.3. Abuse of Dominance:

The revenue share in MVAS market is significantly dominated by the operators on the basis of three types of costs-

- Cost of market entry in terms of license & spectrum charges, marketing & branding costs and customer acquisition costs.

Figure 4: Issues Related to Integration



Source: TRAI & IAMAI

- Cost of infrastructure usage & interconnection
- Cost of billing & collection (Kale, S., Bhandari, L. (2008).MobileVAS-IAMAI).

Consequently they try to dominate the market by controlling the MVAS services fees, service portfolio to be offered to customers, service content, billing etc. & retain around 60-65%[7] of the total revenues while the remaining gets shared among the technology enablers(15-20%), content developers/aggregators(15%) &content owners(10%)[8](MVAS-TRAI paper, 2010).

This leads to insufficient RoI (Return on Investment) to promote innovation & entrepreneurship in VAS followed by fewer investments for the growth. On the other hand even operators need to retain their share to fill the revenue gap created from stagnating core services & attract network investments.

But performance in other countries clearly indicates that operators are not shortsighted to ignore the potential of VAS in spite of their market dominance, hence this cannot be the causal factor.

Hence revenue sharing should be based on the type of VAS depending on the level of innovation & utility involved in it & not a single model. Also it should not be left open & adjustable based on commercial negotiations. If VAS providers were license holders, the TRAI would have issued a Reference VAS Offer similar to what it does in case of interconnection with Reference Interconnect Offer (RIO).

1.1.4. Information & Coordination Asymmetries

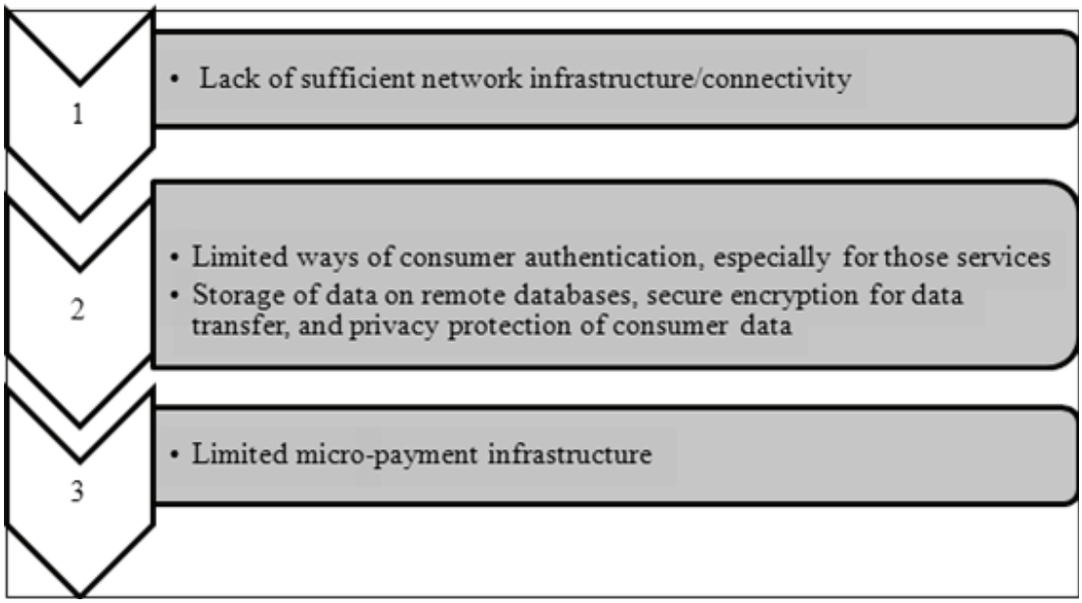
There is lack of coordination & integration among the information systems of operator & VAS providers thereby leading to differences in billing, difficulty in keeping track of revenues earned & accrued, lack of transparency in transaction data like number of downloads& absence of systems to address grievances.

The lack of credibility & greater bargaining power of the operators affect the content providers from investing significant amount in content innovation(MVAS-TRAI paper, 2010).

There are other issues like:

7 Trai Mvas Paper, 2011
8 Trai Mvas Paper, 2011

Figure 5: Issues in Authentication & Infrastructure



Source: TRAI & IAMAI

1.1.5. No Provision for Independent Price Discovery-"Walled Garden Approach"

The customers can access the content only on the operators' platforms. The content selection & transfer over the network is fully controlled by the operator who also fixes its prices. VAS providers need to host their content separately with each service provider & connectivity is to be made with each operator separately for routing the content. Separate agreements should be made with each operator.

Hence content providers cannot fix the prices & directly sell to the customers. This leads to low growth equilibrium.

1.1.6. Tied Situation

The DoT assigns the short codes to the Telecom Operators who then assign them to VAS providers & content providers. Since the shortcodes are assigned to a telecom operator, it may not get uniformly accepted by all the telecom operators. Hence, the customer experience of the VAS will differ from telco to telco(MVAS-TRAI paper, 2010). So, the VAS provider needs to tie-up with all telcos so that the allotted shortcode gets recognized across all the networks thereby decreasing the difficulty, costs & efforts of the VAS/Content providers to reach large masses through multiple operators.

1.1.7. Lack of Consumer Authentication & Micro-Payments Infrastructure

In the absence of adequate infrastructure, the VAS players collect the charges through the operators. The access & carriage charges get deducted by the operators whereas the content charges directly go to the VAS providers.

The issues are summarized below:

2. Breaking the "Vicious Circle"

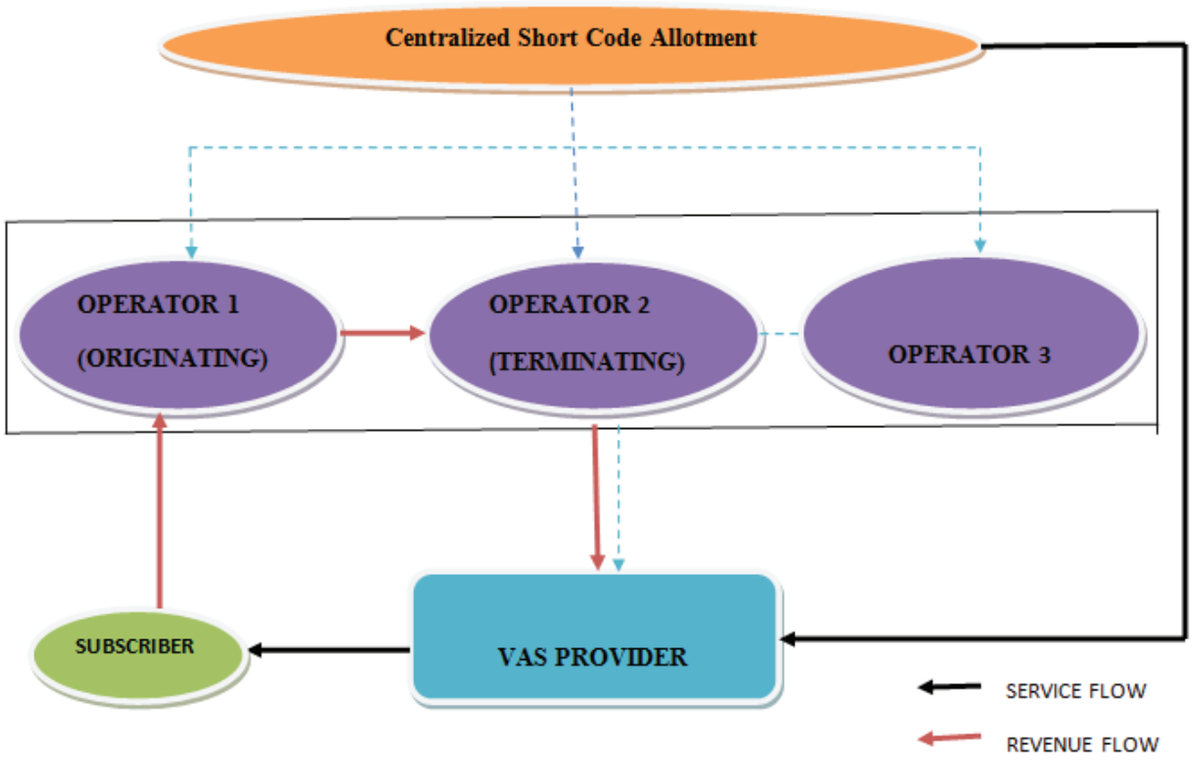
Three key areas have been identified for growth. They are:

- Revamping the business model of VAS industry
- Comparing its performance with other countries
- Identifying the solutions for the regulatory gaps
- Phased implementation of the solutions

2.1. Proposed Model

In this the user has open & unrestricted access to the content developed by the VAS providers (VASPs) without any intervention from the operators. The content can be accessed either through a web browser, SMS, third party content providers' links etc.

Figure 6: Proposed Open Access Model



Source: TRAI

The access charges will be paid to the operator whereas the content charge will directly go to the VAS provider. In case payment infrastructure in unavailable, the VAS provider can host its contents with only a single operator rather than hosting it with each operator.

Customer can access the content by the help of a uniform short code from any operator's network. The originating operator will pass the revenue after collecting billing, interconnection & customer-care charges; similarly the terminating operator will pass the revenue to VAS provider after deducting transit charges(MVAS-TRAI paper, 2010).

This model ensures increased competition among VAS providers to provide better services thereby ensuring higher efficiency.

2.2. India Vis-À-Vis Others

Different countries have adopted different licensing regimes, in some countries like Australia there is no need for licensing; the VAS provider simply needs to submit intimation to the industry register.

However VAS models have been successful in many places like Kenya where M-PESA remittance services offered by Safaricom & Vodafone are used by more than 27% of the population (Deloitte-ASSOCHAM, 2011). The following table indicates that success models have been derived on the basis of multiple factors like business model, government initiatives, market force, customer demand & awareness. It also gives a detailed analysis of the performance of VAS market across different countries as a result of regulatory recognition.

In India, there is a huge scope lying in Utility VAS services like m-commerce, m-health, m-education etc. They are in nascent stage & lack government control & initiatives, customer awareness & user-friendliness, support infrastructure & strong coordination among the stakeholders to form a high equilibrium ecosystem.

Currently various players have taken the initiatives by partnering with government & operators to launch services like "m-Gurujee" which provides alerts & updates about exam details like results.

Table 1: Comparison among the performance of different countries

Country	*Business model adopted*	*% of non-voice revenues*	*Licensing*	*Impact*
Singapore	On-deck	32	Yes	Fast growth in m-commerce mainly in areas like shopping, movies, fashion, food etc.
US	Open-garden	30	Yes	Strong market for "Premium VAS" services like "CreditEX"-an m-payment solution
China	Joint venture or through contract	27	Yes	Highly popular IM service "Fetion" from China Mobile with more than 100mn users, weather forecast & crop information services
Japan	Off-deck	27	Yes	m-wallet service "Felica" is a huge success, others like m-tv, m-game-concierge
Brazil	On-deck	14	Code of conduct	Fast growth in social networking, SMS & MMS services
Malaysia	On-deck	18	Yes	Growth in location based GPS enabled mobile applications
South Africa	On-deck	30	Yes	Strong presence in social networking services like "Mxit" for chat, education, "Please Call me" messaging service from MTN

Source: Deloitte-ASSOCHAM Study

Table 4: Current scenario of Utility VAS in India

#	*Service*	*Scope*	*Main Players*	*Initiatives Taken*	*Proposed Initiatives*
1	M-COMMERCE	Payments, Banking & Retail Transactions like P2P Payments, bill payments, ticketing & alerts. Important for financial inclusion	Spice, Oxicash, MChek, NGPay, ICICI's iMobile	Banks like SBI,ICICI,HSBC are providing SMS based alerts New channels like CNBC giving stock updates	Collaboration between RBI & TRAI for laying the guidelines Using the UID infrastructure Introducing MNO led or Hybrid models Tightening the KYC norms Increasing customer awareness through advertising
2	M-EDUCATION	Providing training & learning content through applications using SMS, WAP, USSD etc.	Spice, EnableM, Tata Docomo, Deltics	mGurujee & IGNOU applications which provide exam alerts & results	Lead involvement of government Coordination among the stakeholders for smooth content delivery Promoting distance education Affordability
3	M-HEALTH	Health alerts, updates & patient monitoring systems	AIIMS, Apollo, Dr.Batras	TeleDoc allows village health workers to communicate with doctors	Tie-up between operators & healthcare providers Government driving the application developer Focus on voice based applications
4	M-GOVERNANCE	Improving the delivery of government services	Bihar & Kerala governments	Film ticket booking from handset	Widespread connectivity & collaboration between operators & government

Source: Deloitte-ASSOCHAM Study

2.3. Solutions for the Gaps

Based on the above learning, the following table gives a comprehensive overview of the regulatory & business model gaps prevalent in India, solutions proposed to fill them & their potential implications on the market & concerned stakeholders in the ecosystem. 2.4 Recommendations for VAS Industry

Table 2: Recommendation Model for filling Regulatory & Business Model Gaps

#	*Business Model/Regulatory Gaps*	*Proposed Solutions*	*Potential Implications*
1.2	Absence of licensing regime for the value added service providers(Regulatory)	Provision for licensing terms under UAS License	Positive Impact: It will protect the interests of consumers & VASPs, Ensure unbiased interconnectionfrom operators, Enable them to go to TDSAT for dispute resolution It will define the standard terms of agreement between CSPs & VASPs The TRAI can issue a Reference VAS Offer Negative Impact: It will affect the small MVAS players as they need to fulfill obligations-paying license fees thereby hampering innovation & growththereby burdening them financially
1.3	Lack of standardized revenue sharing model among the involved stakeholders(Regulatory)	Developing standard revenue sharing models based on innovation & utility for different VAS categories. Operators should separately specify charges for platform & marketing. Content provider should have the flexibility to adequately price product	It ensure attractive RoI mainly through innovative services like m-commerce, m-health, video applications for VASPs Also help the operators cover their revenue gaps from core services & attract higher investments
1.4	Lack of standardization in short code services & related fee payments(Regulatory)	Centralized allotment of short codes to the MVAS providers without involving the operators, the codes should remain uniform & active across all operators. Also the fee payment process should be standardized.	Fast development & deployment of innovative applications across all regions irrespective of the operators'' networks.
1.5	Lack of an open access model for content delivery to the customers(Business Model)	Providing open unrestricted access to content of choice irrespective of the operators' platforms. Also the VASP should be able to host its content with only one service provider & the revenue will be passed to the VASP after distributing the charges among the involved operators.	It will promote innovative applications. It will increase healthy competition among the VASPs to deliver appropriately priced content & among the operators to provide most economical rates for content hosting. Thus it will boost the growth of VAS market by working in collaboration with operators.
1.6	Lack of transparent regulatory framework, government initiatives, payment & authentication infrastructure & dispute resolution mechanism for Utility VAS(Regulatory& Business Model)	1.Provision for regulations for m-banking by collaborating with TRAI & RBI 2.Development of ecosystem for providing affordable solutions 3.Ensuring interoperability of applications across operating system	Faster proliferation of innovative applications for m-commerce, m-health, m-agriculture, m-education etc. which will promote financial inclusion for the unbanked population & further boost-up the VAS market.
1.7	Lack of integration & coordination among the stakeholders' information systems(Business Model)	Provision for reconciliation & integration guidelines to allow information sharing on content specific usage. The IAMAI can play an important role by asking its members to proactively adopt standards as a part of self-regulation.	1.Increase in transparency regarding content transactions, earned revenues & dispute resolutions 2.Decrease in billing errors for customers
1.8	Lack of standards related to piracy, intellectual property, authentication etc.(Regulatory)	1.Authentication standards for content download should be set-up 2.Content piracy control & IPR monitoring should be put in place 3.Option to the customer for receiving promotional content 4.Industry standards for local language specific content	1.Promotion of favorable environment for VAS 2.Protection of customer rights & content ownership

Table 3: Proposed Framework for VAS industry

Measure	Impact	Should be adopted immediately	Should be adopted in long term	Concerned stake-holder
Developing a custom-built revenue sharing model for each service	Long-term	×		Government & regulator
Slashing the data service tariff rates / discount plans	Medium-term	×		Cellular Service Providers (CSPs) & VASPs
Availability of cheap smart phones (<□5000)	Medium to long term	×		OEMs
Developing multi-lingual region specific applications	Long term	×		ASPs, content developers & aggregators
Innovative content based on contextualization	Long-term	×		Content developers & aggregators
Innovative plans like service bundling & usage based pricing	Short-term	×		VASP
Consolidation of the market	Long-term		×	VASP
Deploying self-service solutions	Medium-term		×	CSP & VASP
Licensing of the VAS players	Long-term		×	Government & regulator
Adopting "PULL" strategy for the customers	Medium-term	×		CSP & ASP
Adopting an open-access "OFF-DECK" business model	Long-term		×	CSP & VASP
Seamless network coverage with uninterrupted connectivity	Long-term	×		CSP
Standardization of content delivery platforms & formats	Long-term	×		Content developers & aggregators
Hiving-ff VAS business into separate entities	Medium-term		×	CSP
Financial inclusion(Utility VAS)	Long-term	×		Government & regulator
Centralized allotment & uniformity in short codes	Long-term	×		OTT Players
Transparency in data sharing with the content providers	Long-term	×		Regulator & CSP

'×' Indicates Affirmative

4. The Way Ahead

The VAS industry in spite of its multiple challenges seems promising substantiated by the fact that the customer spending on the services is increasing gradually thanks to the fast proliferation of smartphones& launch of more friendly applications.

However the focus of the industry should immediately shift from infotainment VAS towards utility VAS as it can only assure sustained revenue generation for the ecosystem. The following figure depicts the upwards trend in VAS currently in the market:

ALL FIGURES IN-□ PER USER PER MONTH
SOURCE: IMAI-IMRB REPORT 2012

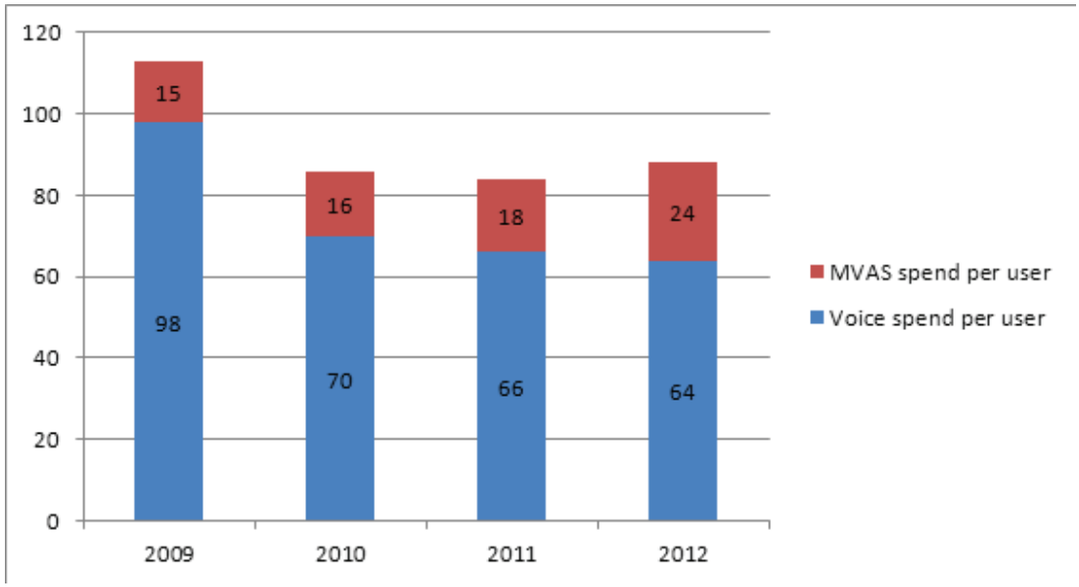
4.1. Scope for Financial Inclusion

"M-banking" is one of the promising tools of financial inclusion for the unbanked population. However in May 2012, close to 3.34 million transactions were concluded for ₹2.86 billion through mobile as against 1.28 million transactions of ₹0.91 billion in May 2011[9]. This growth rate is significantly low as compared to the number of bank accounts & vast mobile subscriber base of 930 million[10].

This can be attributed to the issues like lack of coordination between RBI & TRAI, absence of online cyber security laws & regulatory framework for m-governance,

9 Economic Times
10 Voice & Data

Figure 7: Customer usage trend



ownership of the customers, control of the transactions & appropriate revenue-sharing models(Kale, S., Bhandari, L. (2008).MobileVAS-IAMAI).

A win-win situation can be achieved if operators & banks seek for a collaborative approach taking into consideration the KYC (Know Your Customer) related security concerns, quality of service, customer experience & diversity of operators. RBI has proposed a bank-led model where it will take care of KYC & transaction volume while TRAI will deal with the interconnection issues & setting tariffs for the customers. This approach with clear demarcations seems to be successful in future.

In addition to all these, customer awareness & friendliness is very crucial for the success of any business model. Models like M-PESA in Kenya & G-CASH in Philippines were primarily successful because of this reason.

5. Conclusion

The Indian VAS industry is growing at a snail's pace. One of the primary reasons behind it is the lack of regulatory framework & licensing for the VAS players thereby leading to multifold secondary reasons like biased revenue sharing models, over-dependency on basic services, lack of innovation & multilingual content, inefficient information sharing, dependency on operators for supporting infrastructure etc. All these reasons have initiated a vicious circle of uncertainties in the telecom ecosystem leading to paralysis in growth due to which the industry is unable to replicate its growth trajectory from voice for the data services.

However there lies a huge scope for growth for the sector provided certain measures are implemented like suitable collaborative business models among the stakeholders to foster innovation, coordination among the regulators to promote services like m-banking & M2M & creating customer awareness about the services(MVAS-TRAI paper, 2010).

In a nutshell the success of this industry lies heavily on the way the inter-dependencies among the stakeholders are controlled to benefit the end customers & the economy in the long-term.

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Reactive Data to Proactive Intelligence – the Way Forward for Telcos

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Abstract

Earlier this year Wall Street valued Facebook over hundred billion dollars. Google, one of the biggest giants of Internet, earns close to ten billion dollars in a quarter year. So what makes Facebook or Google so valuable is – the data assets that these companies have compiled over years coupled with analytics providing insights in to their user's lives. Traditionally telcos have been providing services such as voice, messaging, data and other value added services to customers globally. While providing these services telcos have built a mountain of information generated by subscriber's usage. The data asset that telcos have accumulated is complete with respect of subscriber's personal information such as gender, age, location, demographics etc. Are there real opportunities for telecom operators to cash in the existing data assets?

In this paper we have represented data monetization opportunities for telcos in the 2X2 matrix, with existing and new data assets along the vertical axis and downstream and upstream customers along the horizontal axis. Quadrant formed between existing data assets and downstream customers will have opportunities such as CEM, tariff plans, cross-selling and customer micro-segmentation. Opportunities in other quadrant, formed between new data assets and upstream customers, will be offerings in sectors such as healthcare, transportation, insurance and government. This paper creates a framework for telcos to understand their current position and strategize their desired position as part of recommendation. It also touches upon the challenges of using user data and the legal policies around it.

Keywords: Business Intelligence, Data Monetization, Data Analytics

1. Introduction

With major upheaval going on in the telecom industry, one major challenge telcos face is the decline in their traditional fixed-line businesses and maturing mobile voice services. And the impending threat looming from Over The Top (OTT) players and now with outsourced networks affecting the core assets of telcos, the threat is cropping up not only from over but even from under the floors players!

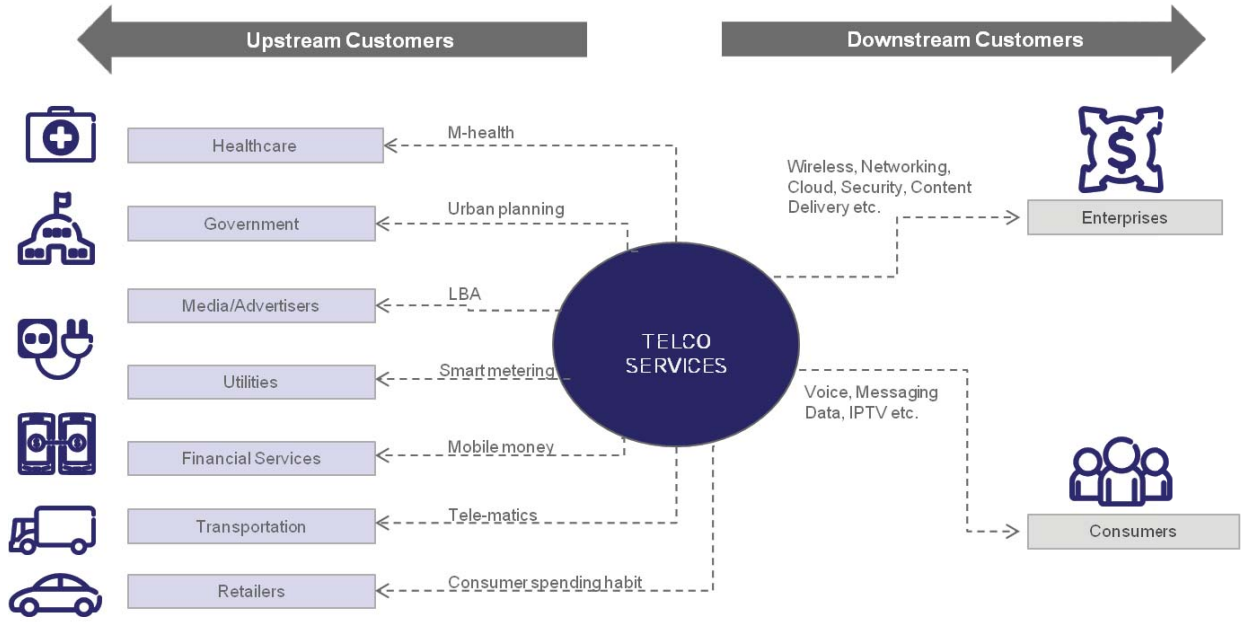
At the point at which many operators, at least in Europe and North America, are seeing the services opportunity ebb away, and ever-greater dependency on new models of data connectivity provision, they are potentially cutting off (or being cut off from) one of their real differentiators – the huge pile of data sitting in their system. The richness of the consumer data that flows through telco networks is far greater than anything Google or Facebook has.Also as per Ericsson Traffic and Market data Report, Nov 2011, mobile data traffic is projected to increase 15 times by the end of 2017. With all the talks on big data cropping up from all the corners, telcos still do not have any proper direction on how to approach this big data puzzle.

This whitepaper entails an approach which provides a four pronged strategy on monetizing the big data. Here, we list the various dimensions of customer data present with the telco in petabytes of size. Examples include:

"Personal Data, Bills & Service Data, Contacts, groups & apps data, devices data, internet data, contracts & products data, context data, content data, etc."

With the four pronged data monetization strategy detailed in this whitepaper, we segregate the data as existing dataset and new datasets. Existing datasets are formed from the traditional services. New datasets are still not huge in size and are created from new services such as

Figure1



This Figure illustrates various services offered by Telco to its (upstream & downstream) customers
See Rochet and Tirole [2] on the further examples on two sided markets

M2M, mobile payments, m-commerce, etc. These data sets are then intersected with downstream as well as upstream customers and the four pronged approach (2X2 matrix) is created.

More details on upstream and downstream customers are shown in the below picture.

The 2X2 matrix formed out of the existing and new data assets intersected with upstream and downstream customers is shown below.

With the help of this 2X2 matrix (four pronged approach),telcos can deal with the big data scenario with more systematic approach. Each quadrant of this matrix is explained in detail in further sections with potential opportunities listed with each quadrant. Along with the approaches to using big data more systematically, this whitepaper also underlines the legal aspects of customer data use. The last section provides the recommendations of various monetization strategies and the way forward.

Quadrant I (New Data Assets, Upstream customers)

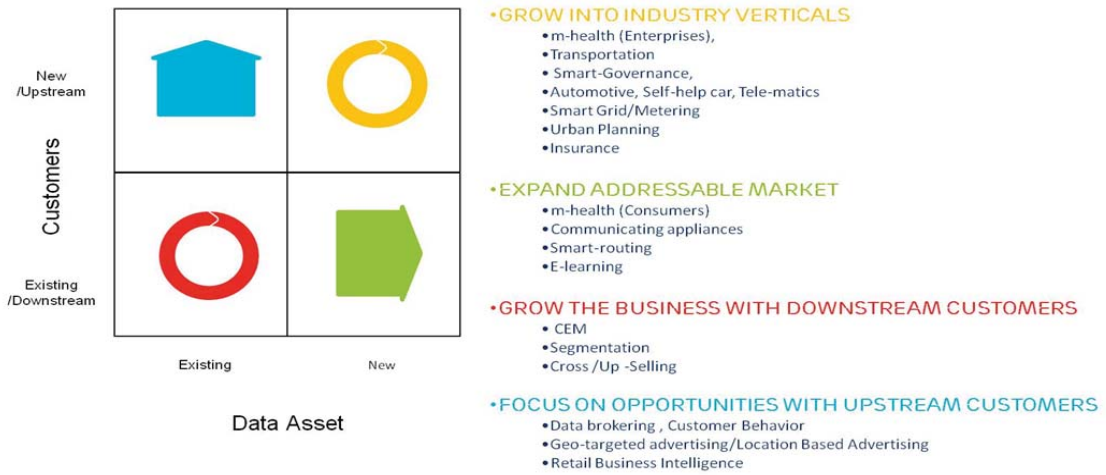
Harbor Research study estimated that 15 billion connected devices will move 35 trillion gigabytes of data at a cost of $3 trillion annually – all by 2015. Developments in M2M, mobile payments, m-commerce and other such services will drive the creation of data in the coming years. Growing into industry verticals is a strategic step for telcos to monetize the newly created data asset. The monetization opportunities in this quadrant arising out of new data asset will be primarily focused towards upstream customers in different industries. An illustration of this is shown in figure4 below.

As shown in the above figure 4, we have new data assets getting created from services like Smart Metering, Smart Grid, Automotive, Smart Homes, M-commerce, M-payments, M-health and many more. These data assets when churned using analytics can provide useful insights.

For example, someof the offerings to industry verticalsare:

1. **Carbon Credits:** Organizations are striving to earn carbon credits with go green initiatives. With smart metering data, telcos can provide intelligent analytical reports on electricity utilization by the organization and how can they improve the wastage.
2. **Less Energy consuming appliances:** Appliances manufacturers can provide with real time usage examples for appliances using lesser energy based

Figure2



This figure illustrates 2X2 matrix with the existing and new data assets intersected with upstream and downstream customers (Developed by author for illustration purposes)

on the smart metering data analytics provided by Telcos.

3. **Urban Planning and Billboard Strategy:** Using telematics in automotives, intelligent analytical reports can provide information about highly commuted area in the city. These reports can be sold to government for road/commute planning. Government can also use this report to understand how fast a city is developing in terms of traffic. A city level planning can also be initiated based on such reports. Also, it can be sold to advertisers who based on the traffic and the segment can place the billboards accordingly.
4. **Insurance company pricing strategy:** With car telematics, telcos can track driving habits of commuters and can sell that data to insurance companies to plan the pricing strategy for individuals. Progressive, a US based car insurance company, provides personalized rate to its customers by tracking their driving habits.
5. **Cars performance:** Also with car telematics, based on the number of repairs required for the cars, the manufacturers can highlight as a real time example of their cars performing well.
6. **Consumer Spending Habits:**The data available to telcos using mobile money and mobile payments can reveal significant insights in to consumer spending habits. Such information can be used by various upstream customers starting from retailers to manufactures and advertisers. Google, the internet giant, also launched its wallet service to track consumer spending habits.
7. **Epidemic alert/Disease Pattern:** Based on the m-health data, telcos can sell intelligent reports to government to provide with various disease patterns existing in the city. Any new epidemic occurrence can be handled efficiently if the details are known in advance. Such data can also help medical researchers todelve deeper into the disease patterns emerging in the country.

And many such opportunities exist that can be monetizedwith the new data assets getting created in the telcodatabases.Some of the operators are already trying to achieve this kind of data monetization. Such examples include:

1. AT&T knows the location of a phone to within a mile radius at the time each CDR was generated, making it possible to determine the distance traveled from home by each cell phone every day. The group found that, on average, people living in Manhattan travel 2.5 miles most days, compared to five miles in Los Angeles. “But we also found that

Figure 3

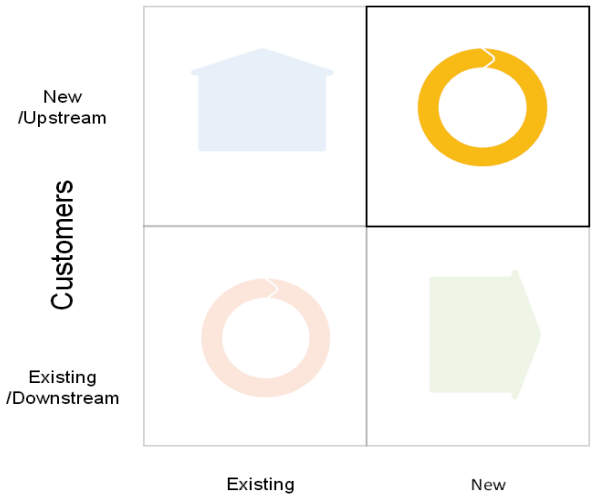
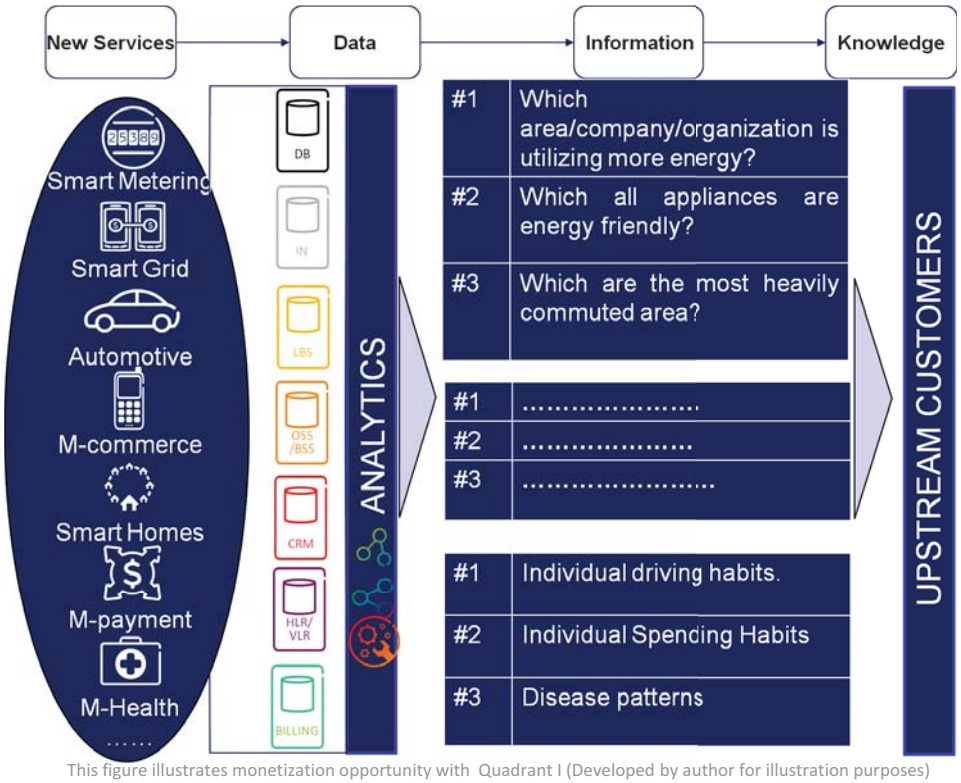
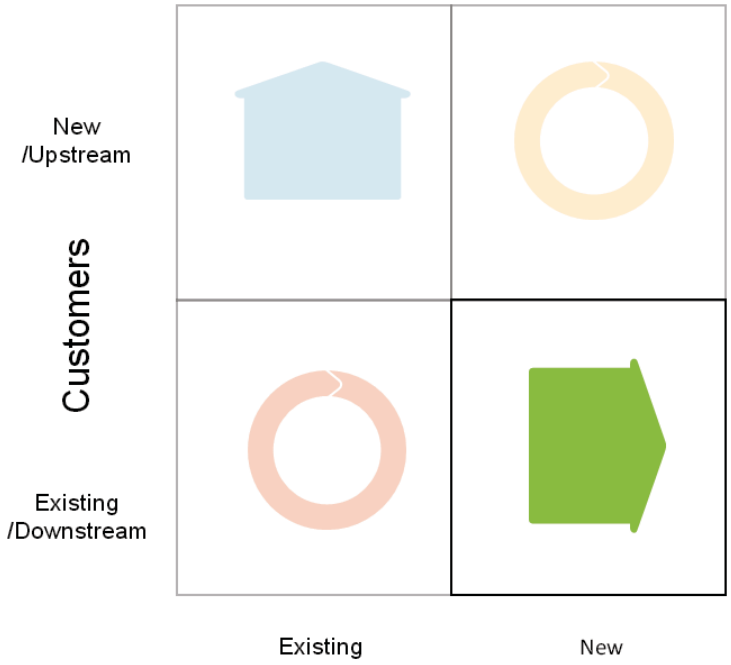


Figure 4



This figure illustrates monetization opportunity with Quadrant I (Developed by author for illustration purposes)

Figure 5



when you look at the longest trips people make, people that live in New York go significantly further, 69 miles on a weekday compared to 29 in Los Angeles. This information can be used with city planners, who would usually have to resort to expensive and limited surveys to gather such information. "This kind of data can help them decide how to invest resources, for example if they want to know where to build a new train or subway station," he says. The AT&T work was presented at a recent workshop in Cambridge, MA, earlier this month as part of the NetSci conference on network science.

2. Expand Addressable Market

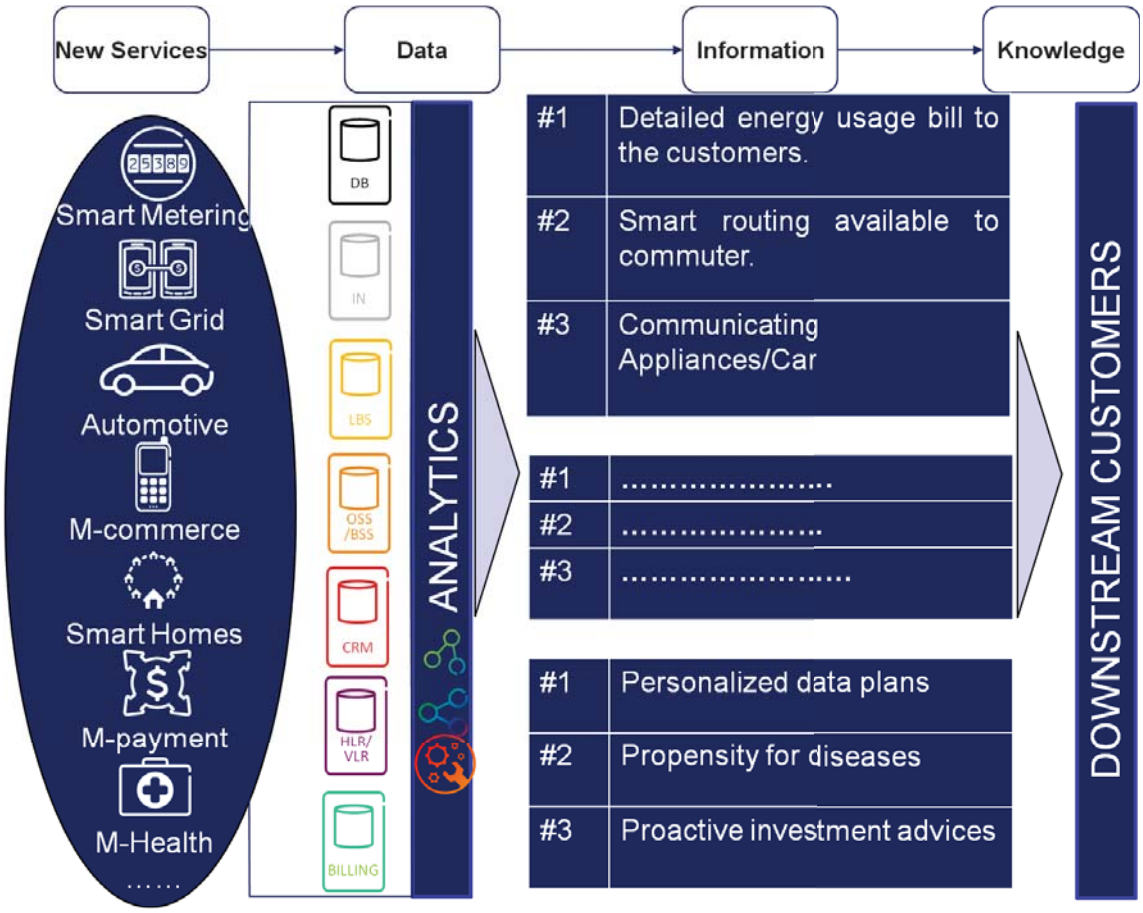
As mentioned in the section above those recent developments in M2M, Mobile payments, m-commerce and other such services will create petabytes of new data. Providing new offerings to downstream consumers is a strategic step for telcos to monetize the newly created data asset. The monetization opportunities in this quadrant arising out of new data asset will be targeted towards reaching downstream customers with new offerings. An illustration of this is shown in figure6 below.

Figure 6As shown in the above figure 6, we have new data assets getting created from services like Smart Metering, Smart Grid, Automotive, Smart Homes, M-commerce, M-payments, M-health and many more. These data assets when churned using analytics can provide useful insights.

For example, some of the new offerings focused towards downstream customers are:

8. **Personalized Energy Bills:** As telcos will have the data for individual houses from the smart metering devices, telcos can sell that data to provide with detailed personalized bill to customers providing details around what time of the day more energy is being used and if required even details about which appliances are consuming more energy.
9. **Smart routing applications for commuters:** In other words, imagine receiving up-to-the-minute (even second) information about accidents, sched-

Figure 6



uled roadwork, and congested areas and then changing your "route" to optimize travel time. From a road warrior standpoint, this is great news as we all benefit from less travel time and perhaps a smaller gas bill. But when you look at this on a global scale the benefits are mind boggling. According to McKinsey:

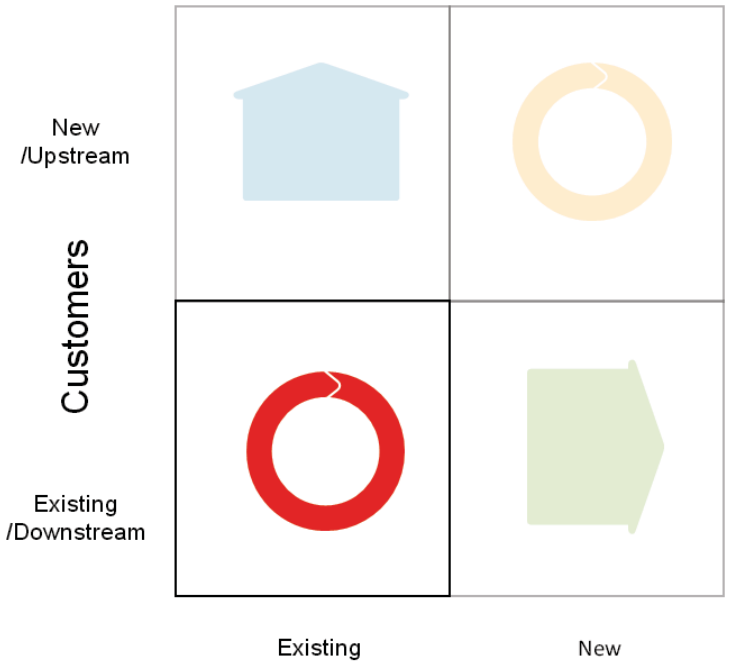
"*All told, we estimate the potential global value of smart routing in the form of time and fuel savings will be about $500 billion in 2020. This is the equivalent of saving drivers 20 billion hours on the road, or 10 to 15 hours every year for each traveler, and about $150 billion on fuel consumption. These savings translate into an estimated reduction in carbon dioxide emissions of 380 million tonnes, or more than 5 percent a year.*"

10. **Communicating Appliances /Cars:** Cars or appliances can provide real time update about the health of their engine. Customers can get real time updates of such M2M devices on their mobile phones using M2M apps.
11. **Predictive health alerts:** Based on the disease/ health patterns coming out of M-health data, Telcos can provide customers with health alerts about an individual. If the previous history shows that an in case of such epidemic alert in future.

3. Grow the Business with Downstream Customers

The data asset existing with a telco includes subscriber's personal data, tariff plan, call usage details, data usage, websites browsed, services used, handset data, location etc. Based on the existing data sets the opportunities arising out of this quadrant primarily comprise of Customer

Figure 7



experience management, User profiling, Segmentation and Marketing. An illustration of these opportunities is shown in figure 8 below.

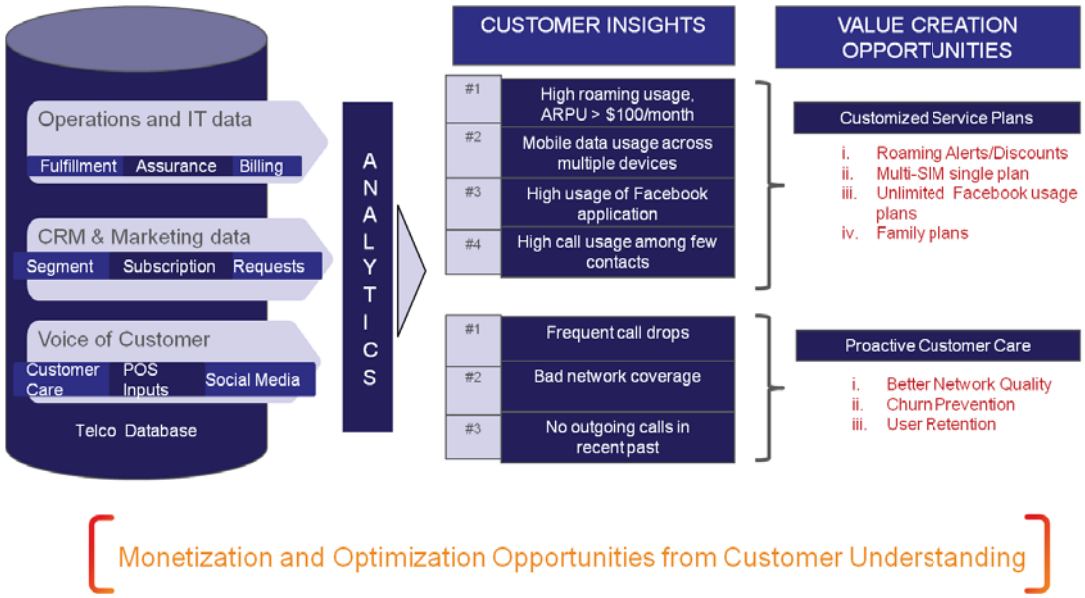
The above figure showcases integration of data from CRM, IT & operations with Voice of Customer to gain customer insights. Customer insights gained by analyzing the aggregated data from various sources can help the telco to identify value creation opportunities such as:

1. **Customized service plans**: There could be customer segments that wouldn't understand their data usage needs, and would prefer paying for applications such as Facebook rather than paying for fixed volume of data so Telcos can offer unlimited application usage plans to such customers. European Operators have started offering multi-SIM single plan propositions for mobile data shared across two different device or even two different users.
2. **Proactive customer care**: With a proactive customer care CSPs can increase their ROI by taking proactive action on KPIs related to network quality, user retention and churn prevention. These KPIs are important focus areas of CSPs owing to subscriber acquisition cost, customer loyalty, customer LTV etc. According to a report published by Analysys Mason, CSPs are increasingly moving towards customer self-service because it has proven to reduce customer care costs by 20% and increase ARPU by 18%.

Some of the operators are already trying to achieve this kind of data monetization. Such examples include:

1. Vodafone Italy offers second stick to share data allowance with primary stick. TelefonicaMovistar offers plans based on speed, data, time and application to target different customers segments.
2. Operators such as Mobily Saudi Arabia, Virgin Mobile Chile, 3 Hong Kong, Digi Malaysia and Reliance Communications (RCOM) India have launched a mobile broadband (MBB) offering whereby subscribers are allowed unlimited WhatsApp usage and have a fixed-size data bucket for the rest of their applications.

Figure8



However, data monetization has raised various issues for sharing customer data without their consent. One such example is of Carrier IQ:

1. Last year a controversy came to lime light when it was exposed that CSPs in US are using the data provided by a company named Carrier IQ, a company that secretly collated data from devices. The CSPs had pre-installed an IQ agent on the devices sold to customers, the IQ agent secretly collected phone usage information such as application issues, battery performance, calls dropped etc from handsets. The CSPs were accused of using the information to target offers. Now, the Verizon and AT&T are seeking permissions from consumers for using the data, which may just be the critical difference in the eyes of the consumer.

4. Focus on Opportunities with Upstream Customers

Traditionally the business model telcos have adopted is to charge consumers in return of services provided. However, with the dawn of internet more and more businesses have moved away from being paid directly for services. Companies such as Google, Yahoo have developed newer business models where instead of charging consumers for their products and services have found innovative ways of earning money. With newer business models the telcos can use existing data assets to expand its customer base focusing on upstream customers and develop newer ways of earning money.

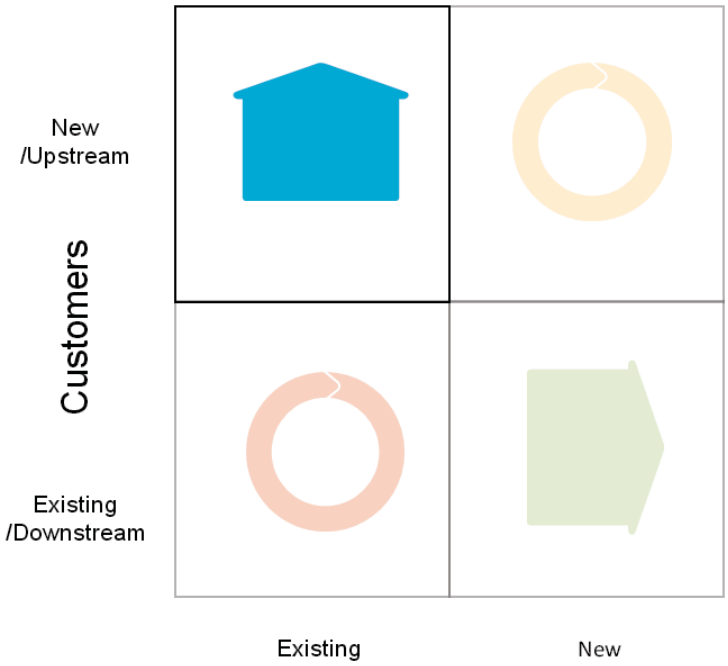
The opportunities arising out of this quadrant will consist of Location based advertising (LBA) and Data brokering. These opportunities are detailed as follows:

4.1. Location Based Advertising and Marketing

Among various other channels in marketing media, mobile channel is set to increase owing to increasing smart phone adoption and mobile internet growth. Berg Insight estimates that the real-time mobile LBA will grow at a compound annual growth rate of 90.9 percent, the real-time LBA market is forecasted to be worth € 4.9 billion in 2016, corresponding to 28.3 percent of all mobile advertising and marketing. This means that location-based advertising and marketing will represent more than 4 percent of digital advertising, or 1 percent of the total global ad spend for all media

The location of the mobile user when coupled with other marketing variables such as behavior and demographics can reveal important insights. These insights can be of utmost importance for businesses and brands looking to target the right audience. An illustration of this concept is shown in the below figure.

Figure 9



The customer's real-time location can be appropriate targeting variable for business such as restaurant, brands or a movie-theater. Products and services offered by such local businesses are more likely to be purchased on impulse at a location closer to customer's real-time location.

However, customer's residence location can be the most appropriate targeting variable for local businesses such as gym chain, a car servicing center or a hairdresser. Products and services offered by such local businesses are more likely to be purchased at a location closer to customer's residence.

4.2. Data Brokering

Telcos can also broker the consumer's personal data, interests and behavior to companies willing to target the right audience. Doing so will require shift from traditional business model of charging for services to newer business models such as free services or discounts in return for consumer's personal information. An illustration of this concept is provided in the diagram below:

Advertising spending on smart phones and tablets has more than doubled to $650 million annually over the last five years, according to EndiMaran, senior VP at Nielsen techn and telecom advertiser solutions.

Almost sixty percent of advertising expenditure on smart phones went to TV from 2011 to the second quarter of 2012, according to Michael Winter, managing director for digital strategy at media buying firm PhD Network. Around one-third went to print and only 9 percent went to the Web. The above illustration showcases the use case where Telcos can mine insights on Customer Buying pattern, refer illustration 11 above, and earn a chunk of the marketing spend by OEMs.

Some of the operators are already trying to achieve this kind of data monetization. Such examples include:

1. O2 Media's You Are Here campaign for Fitness First, gym and health club chain, enhanced Fitness First's top line by almost £400,000. Fitness First targeted O2 customers with location-based messages offering a free two-day pass and details of the nearest club. The campaign resulted in over

Figure10

one thousand recipients signing up as new members of Fitness First.

2. In 2011,Zain Kuwait launched its AdZone service, this service enables advertisers to send and receive ads on their smart phones with relevance to their location. Earlier this year, SingTel bought Amobee, a mobile advertisement company, to diversify its strategy and foray in to mobile marketing.

4.3. Data and its Challenges

Over the past two decades, mobile operators have been sitting on the pile of detailed information about their users including their identity, location, preferences and what not. A recent change to the laws requiring user consent for cookies speaks a lot about the changing awareness in users about their control over their own data.

Figure11

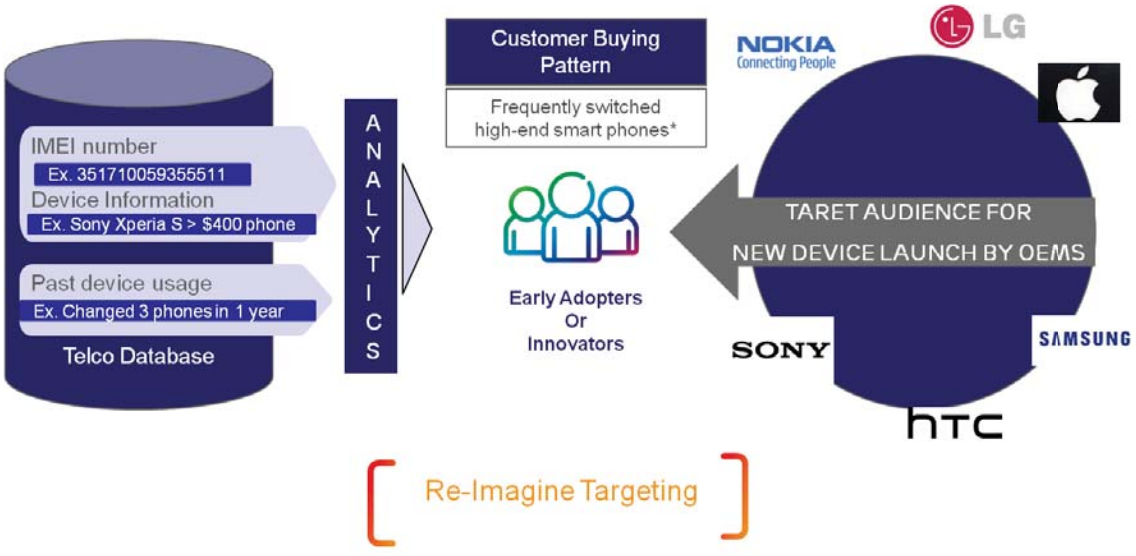
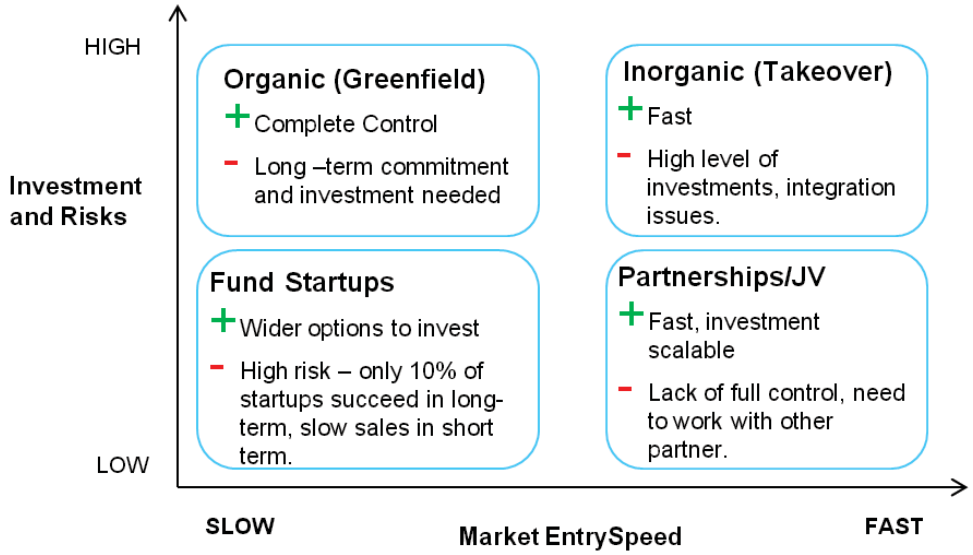
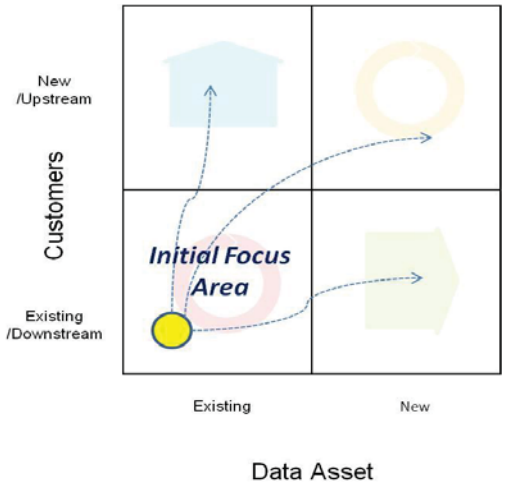


Figure12



Therefore, controlled usage of customer data that is abiding to the security laws of a country has become must. Similar maturing in attitudes in the mobile world also seems to be emerging.

Figure 13



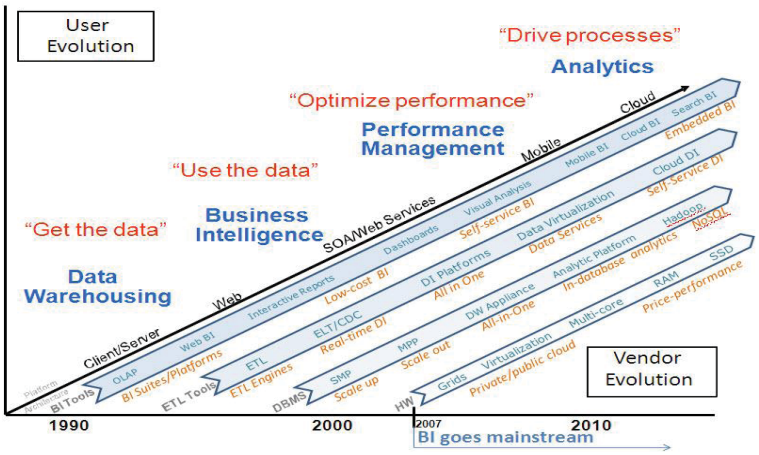
The Telco2.0 report goes on to say: "There are differing legal frameworks and approaches globally...and little commonality of approach, although there is increasing commonality in legal outcomes with rights of individuals' privacy winning over rights of commercial organizations keeping data."

Therefore, it means that the administrative burden on CSPs to comply with the legal aspects of data is going to increase.

End user data can be managed and used by operators if they can get the educated consent of the end users. However in practice, the consent depends on various factors including type of data, apparent value in return and risk associated with the handling of information. Moreover there are legal laws emerging in different countries on handling such data. For example post the terrorist attacks in London in 2005, EU reevaluated its position and made it mandatory to hold the transactional data for legal purposes. EU directed that personal data to be retained for between six months and two years (Directive 2006/24/EC).

Therefore, rather than a blanket agreementCSPs need to adopt a more comprehensive and transparent data handling systems that even makes end users secure about the control over their personal information.Better transparency is fundamental to safeguard end users against potential abuses. It essentially means that people will be able to see what information is held about them, who has access to it and under what circumstances and be able to withdraw or adjust itand the way it is used.

Figure 14



5. Recommendations

Telcos have long been sitting on this pile of data with no proper direction on how to use and where to start. This whitepaper gives a heads up to the telcoson the four pronged data monetization opportunities.Further telcos should analyze each opportunity based on its market attractiveness and relevance to telcos business. Once the telcos have the direction it is equally important to understand the monetization strategy for each quadrant.

Based on the type of data monetization opportunity telcos decide to explore, they will have to choose either one or combination of the strategies listed above such as organic approach, funding startups, inorganic growth or fostering partnerships.The choice of strategy will be based on three dimensions namely investment required, risk appetite, and market entry speed (as shownin the figure 12).

To start withtelcos can move with first quadrant where existing data can be utilized for different monetization options for existing customers as shown in the figure 13.However there are many challenges such as segregated data bases across diverse legacy systems, data analytics and data management capabilities requirements. This makes it challenging for telcos to even use their existing data sets. However in order to achieve a unified understanding of existing structured data, organizations need to answer these key questions:

1. What are the *original data sources*?
2. What *granularity* does the information have?
3. Where is the delivered information *stored* into?
4. Is the data *integrated*?
5. Are there Data *silos*?

And in the process of answering these questions, organizations will have to get the alignment of data sources, data stores, analytics services and delivery services in place which will in turn help in creating/ transforming their BI capabilities with or without big data capabilities as shown in the above figure.

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Authors Profile

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Saurav has close to 8 years of experiences working with Sony Ericsson and ST Microelectronics (now ST-Ericsson) and HCL Technologies. He has specialized in smart phone technologies and has worked across various stages of PLC working with Operators, Vendors and OEMs. He is currently working as a Lead Consultant with Ericsson and has completed his MBA from IIM Lucknow and Computer Engineering from DCE, Delhi.

The Art of Business Transformation

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Abstract

The paper analyzes the end-to-end process of Telecom Business Transformation (which can be applied to other Industries as well). Today majority of the Telcos around the globe are engaged in a business transformation in some form or the other. A business transformation is required to keep pace with the internal and/or the external factors within the Telco. An internal factor maybe defined as an initiative which is driven from within the organization, example "Sustenance like keeping pace with the subscriber growth". While on the other hand, an external factor may also drive an organization to initiate a business transformation like the readiness for Mobile Number Portability.

Business Transformations are critical to the success of an organization in near as well as long term. The same is required to provide the necessary fillip to an organization and the competitive advantage in the market place. Therefore, getting a business transformation "first time right" is crucial and the paper analyzes all aspects that essentially contribute to the success of a transformation program: Definition of Business Case, Resource deployment, Planning & Budgeting, Partner & Product Selection, Stakeholder Management, Performance Management, Change Management and overall Program Management.

The paper aims at assimilating the knowledge garnered during the implementation of large scale telecom business transformations within and outside the country. And present the key challenges faced by various Telcos in an anecdote manner and introspects the proactive resolution that would have helped in the transformation journey.

Keywords: Business Transformation, Telecom Business.

1. Overview

Darwinism finds true relevance in the way business is being driven today. Every industry welcomes its' new entrants; however the *struggle for existence* sooner or later come into play. And in the long run, the outcome of the game is determined by the commonly known principle viz. the *survival of the fittest*. With competition comes: efficiency and optimization, speed and growth, necessity and innovation. Change is the only constant: It is a means of ensuring that the companies stay put on to the game.

Table 1: Approach & Methodology and Definition

Approach & Methodology: To articulate the transformation journey and analyze the critical aspects and success factors; view-points have been assimilated from individuals working across national or international Telcos, System Integrators and Consulting organizations.
Definition of Business transformation: It refers to the making of revolutionary changes to an organization's setup to achieve desired objectives. Transformation has also been referred to as organizational reorientation. Transformational goals shape an organization into something "radically different".

Business Transformation is an approach that attempts to align an organization's activities relating to people, process and technology more closely with its business strategy and vision. This fundamental change aims to meet long-term objectives.

1.1. Business Transformation: Defining the Radical Change

Business Transformation is one such driver that provides the necessary fillip to an organization or the competitive advantage in the market place. The most unique facet of the Telecommunication industry is the fact that it requires continuous investment over the years brought about by changes in regulatory policies, introduction of newer technologies, internal restructuring or market consolidation, reengineering and business transformations.

The art of Business Transformation holds strong semblance with the art of war. Today, Telcos around the globe, in some form or the other, are engaged in a business transformation initiative. Primarily, two factors are instrumental for the initiation of Business Transformation engagement:

Table 2: Key Note Example for Business Transformation

Key Note Example: Bharti Airtel forayed into a Business Transformation engagement in 2004 with an IT outsourcing deal with IBM. At that time, it had 6 million subscribers in India and by 2012 it had become the 3rd largest Telco worldwide with 261 million subscribers and operations in 20 countries across South Asia, Africa and Channel Islands. Other Indian Telco who have followed a similar Business Transformation approach includes IDEA Cellular and Vodafone India.

2. Intrinsic Factors

An intrinsic factor can be defined as an initiative which is driven from within the organization. Typically, an enterprise would have some degree of control over these factors and acceptance of this transformation would be dictated by the cost-benefit analysis. Some examples or characteristics to illustrate this factor are mentioned here under:

3. Extrinsic Factors

In the case of External factors the degree of control maybe limited. At times the requirement maybe "untimely" and/or "immediate" thus making the planning cycle really short. Some examples or characteristics to illustrate this factor are mentioned here under:

Table 3: Example of Intrinsic Factors

Characteristic	*Example*
Growth	BSS Transformation to keep pace with the burgeoning subscriber base.
Consolidation	IT Transformation to unify and standardize operations post in-organic growth (merger or acquisition)
Optimization	Cost optimization to streamline Opex spending
Differentiation	Customer Experience Transformation across Branded Retail Outlets

Table 4: Example of Extrinsic Factors

Characteristic	*Example*
Regulatory	Introduction of Mobile Number Portability
Competition	Replicating new product or services (launched by competition) that requires radical change in IT or Network infrastructure setup
Collaboration	Tie-up and alliances with third party (or non-Telco firm) for joint go-to-market play

Figure 1: Binding Needs of Business Transformation

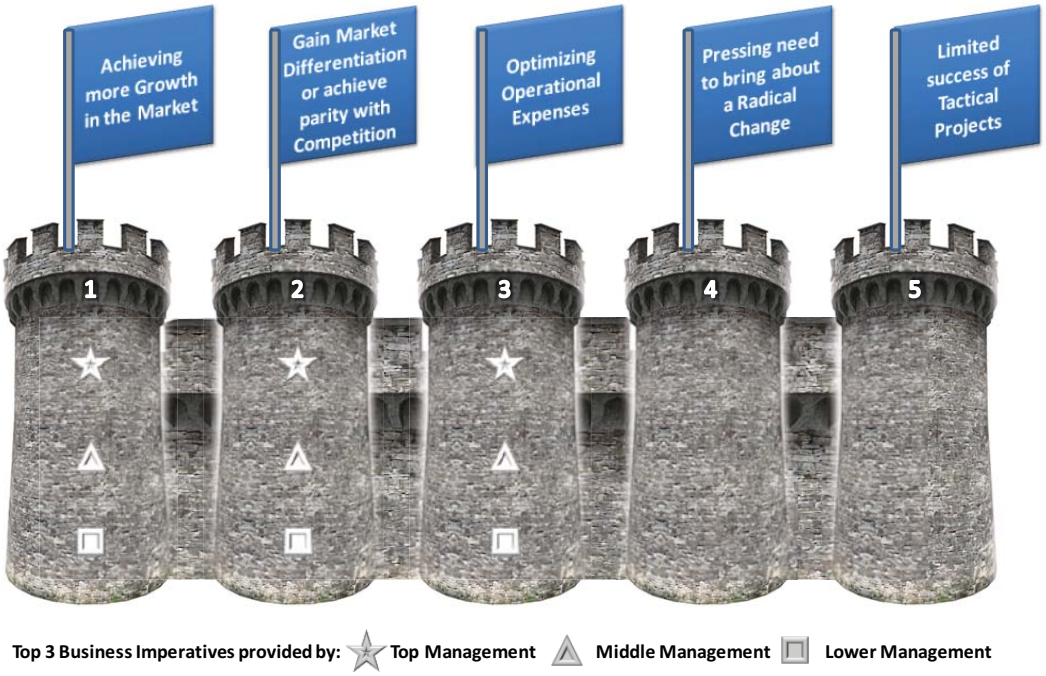


Figure 2: Arrowhead Business Transformation Model

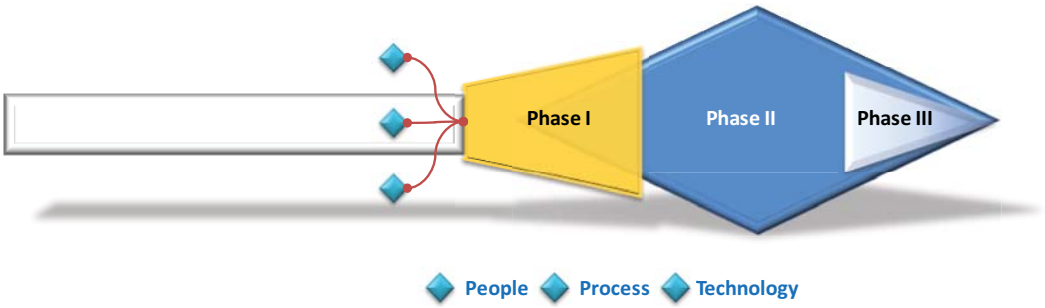


Table 5: Corporate View-point (Critical Business Transformation Lifecycle Phase)

Corporate View-point

Most critical (which would have maximum impact on the end outcome) Business Transformation Lifecycle Phases as defined by management:

- Top Management: Implementation & Rollout Phase
- Middle Management: Rollout Phase (next: Implementation phase)
- Lower Management: Initiation & Implementation Phase

3.1. Strategic Business Imperatives: Understanding the Binding Need

It is interesting to note that individuals across the board (Top, middle as well as lower management) hold following reasons as the top 3 reasons to undertake a Business Transformation:

- Achieving more Growth in the Market
- Gain Market Differentiation or achieve parity with competition
- Optimizing Operational Expenses

3.2. Transformational Roadmap: A Critical Journey for the Organization

Embarking on a Business Transformation is critical for any organization whether big or small. The journey sprawls through various stages before reaching the end objective. It is explained through the Arrowhead Business Transformation Model as illustrated below:

The Shaft viz. the primary structural element of the arrow; to which the arrowhead is attached; represents the pre-transformation journey that an organization has undertaken before making a strategic decision to look forward to a transformational initiative.

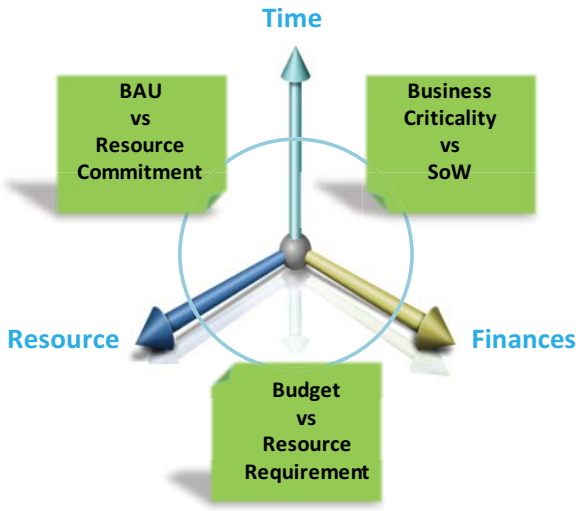
The business transformation roadmap may be characterized into 3 distinct phases:

Initiation Phase ("What starts well ends well")

The initiation phase is pivotal to the success of any transformation. As depicted in the model it holds the arrow head to the shaft and impacts three critical organizational domains: People, Process and Technology. It defines the scope and objective of the Transformation; that most often transcends from the Organization's Vision & Strategy or external market factors.

Large scale Business Transformations warrants a significant investment across three areas: Time, Resource and Finances. The degree of commitment varies based on the nature and scope of the engagement.

Figure 3: Time, Finances vs. Resource Trade-off



A. Business Case Development is therefore the key step in the initiation phase which balances the trade-offs across time, resource and financial commitments:

i. Business Criticality (*How soon the organization wants the project to be delivered*) and Scope of Work (*How vast is the scope of the project*) define the time & financial commitment

ii. Budget (*Is the budget already allocated or fresh approval would be required)* and Resource Requirement (*How much manpower and/or additional resources the project demands*) defines the financial and resource commitment

iii. Business As Usual (*Can the organization afford to expense time at the cost of existing business activities)* and Resource Commitment *(Can the organization let go their prime resources for the transformation)* defines the resource and time commitment

The primary question that any business case demands is to selfishly ask "What's in it for me (organization)?" It's a justification or a reassurance that the said transformation is the only means of delivering the stated objectives and/or bringing about the radical change. In case of heavy duty Business Transformations, the business case requires the endorsement of the Board or Promoters.

B. Partner (or Product) Short-listing and Finalization is another process that has to be undertaken within this phase to support the business transformation. Type of partner(s) includes System Integrators (in case of IT/Network/Technology enabled Transformation), Product Vendor (example: Common off the Shelf products) and/or Consulting organizations (to support Program Management or fulfill the role of Subject Matter Expert). Usually Telcos prefer partners who can provide a bouquet of services and can act as a single point of contact for the execution of the business transformation. Such partners may form a consortium (ally of partners) to front-end or bid for such an engagement. Telcos invite participation by floating Request for Proposal (RFP) and short-list the eligible partners. The short-listed partners are then scrutinize along qualitative (delivery team credentials or product implementation references), quantitative (including commercials) and technical parameters before selecting the preferred partner.

C. Pre-Transformation Planning is crucial for the seamless transition from the initiation to the implementation phase. It helps equip the organization to better manage the transformation journey. Resource identification and allocation are one on the key considerations. Nominated change agents or resources must go through proper orientation so as to better articulate the project objectives in day-to-day activities. While, the transformation goal defines "where the organization wants To-Be"; it becomes all the more important to understand "its' current As-Is state". Know-how of current scheme of things is best described through documentary evidence like staff manuals, organograms, process & policy documents, system architecture document, or system manuals. Having a complete visibility of As-Is documentation is highly recommended before kick-starting the transformation. Planning also encompassed preliminary activities like High level Project Planning, Approach & Methodology, Project phasing (in case of larger scope), logistics and document management.

Implementation Phase (*"The rubber meets the road"*)

Implementation phase is where the actual action kicks-off. This phase is therefore, depicted as the sizeable portion within the Arrowhead Model.

A. Business Requirement Elicitation & Finalization is the *heart and soul* of any Business Transformation. The foremost step is the under-

Table 6: Corporate View-point (Initiation Phase)

Corporate View-point

Key Challenges faced during "Initiation Phase" (in order of priority):

1. Partner / Product Selection
2. Pre-preparation (Project Team Formation, Inter dependency Assessment, AS-IS Documentation)
3. Definition & Approval of Business Case
4. RFP or Preliminary Scope Definition
5. Commercial Negotiation

standing or the articulation of the As-Is blueprint. Key consideration from a program management perspective is the identification of key participants for the business requirement elicitation. Adequate representation should be ensured across end-users, middle management and top management. This would ascertain optimal output as participants across these groups would have different level of envisioning of the To-Be or the end-state. The volume of requirements would reduce as one would move from the end-user to the top management.

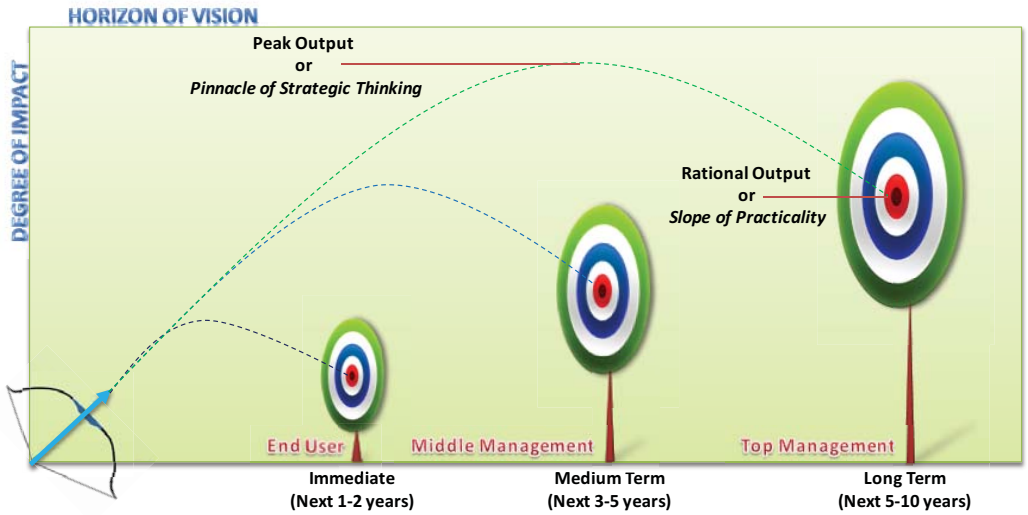
In general, the end-user requirements are operational while the management requirements are of strategic orientation. The horizon of vision vs. the degree of impact is depicted through the Bow-Arrow & Target Model:

The end-user perspective is usually short-term and relates to their routine area of work experience. Typically, their first priority is to ascertain the sanctity of Business as usual (BAU), followed by depiction of contemporary pain areas or challenges. While, the middle management aims at medium term business requirements considering the emerging business dynamics for the next 3-5 years. Top Management holds the highest level of vision (next 5-10 years) considering close coherence with organization's vision, business goals, larger understanding of business environment and market game-changers. Peak output or *pinnacle of strategic thinking* is derives based on the joint-discussion or brainstorming session which defines the Larger set of business requirements. However, accommodating and implementing all the business requirements may not be prudent or practical; hence the requirement should be restricted or qualified with a rational outlook. The qualified set of business requirements is represented as Rational Output or *Slope of Practicality*. The Bow-Arrow & Target Model therefore aptly illustrates the trade-off between total vs. "must-have" business requirements. In case of technology centric business transformations like OSS/BSS Transformation, the business requirement finalization goes through a "Fit-Gap" analysis to understand the optimal set of business requirements that maybe fulfilled through the selected technology solution. The best practice is to adopt or re-align business processes in-line with standard technology packages or Common off the Shelf (COTS) product; while retaining strategic or operational enhancements (process or functionality). This activity is concluded with a milestone known as Business Sign-off.

B. Design & Build follows post the business sign-off. Design stage encompasses definition of solution tailored to the business requirements. In case of technology centric business transformations, design is a decisive stage within the project life-cycle; where actual translation or mapping of business requirements into technical solution is performed. The quality of design determines the ease of build or implementation which is carried out in a Development Instance.

C. Testing is the quality check-point or gating process in technology centric business transformations, where business users jointly check if there is parity between their defined business requirement and the delivered product. A Testing Instance of the system or application is released to the business users only after thorough internal testing (unit testing, system integration testing, performance / stress testing, etc) is done by technology experts

Figure 4: Bow-Arrow & Target Model



and commonly referred to as Business or User Acceptance Testing (B/UAT). It's worthwhile to note that while all defects encountered during the testing may not be reconciled; and hence an acceptance criterion (threshold value based on priority and severity) is defined to provide a go-ahead even with minimal (unresolved) defects.

D. Training equips the end-users with the understanding of the To-Be business processes and/or system functionalities. For example, a CRM Transformation would introduce an advanced front-end tool, and the Call Center representative need to be made aware with the process and system flow or functionalities before the system is made live. A training need analysis (TNA) is performed to ascertain the width and breadth of the training i.e. "Target Audience: *who needs to be trained*" and "Scope: *what all training needs to be imparted*". Training mitigates the "fear of unknown" and is one of the vital aspects of change management. The key theme being: "Preparing the organization for the change". In scenarios where the number of end-users is sizeable (like in the case of Call Centers) a select set of individuals are trained and it is referred to as "Train-the-Trainers" session. These skilled trainers in turn would go and train a larger set of individuals (typically in defined batches) and it is referred to as "End User Training" session.

E. Managing Business As Usual (BAU) while the business transformation is in progress is like the *Sword of Damocles*. The Transformation team is often pressurized by the Operational team(s) to include additional or contemporary business requirements post the sign-off of the business requirements. The level of intensity of such requests becomes manifold with the duration (or unplanned extension) of the business transformation. Needless to mention, that some of these requests maybe genuine, impact the market competitiveness of the operator or even critical from the regulatory perspective. It is equally true that keeping the signed-off business requirement open during the implementation phase might make equate it to a "Pandora's box". Adequate discretion should be applied to accommodate (as well as reject) such request and should be formalized through the Change Request (CR) Process and ratified by the designated authority or Steering Committee (body of key project stakeholders) members.

Rollout Phase *(All's well that ends well)*

It is in the Rollout phase that the business objectives are destined to see the light of the day. Hype and hoopla surrounds the transformation team as *the moment of truth* approaches. Rollout phase is the thin line between success and failure and all efforts should be exercises for one last time to bring adequate closure to the business transformation.

Table 7: Corporate View-point (Implementation Phase)

Corporate View-point

Key Challenges faced during "Implementation Phase" (in order of priority):

1	Requirement Gathering
2	Implementation & Integration
3	User Acceptance Testing
4	Requirement Finalization & Signoff
5	Handling Business As Usual (BAU) Requirements

Table 8: Corporate View-point (Roll-out Phase)

CORPORATE VIEW-POINT

Key Challenges faced during "Roll-out Phase" (in order of priority):

1	Stakeholder Commitment & Support
2	Training
3	Operations Hand-over
4	Integration / Dependency Management
5	Cut-off Management

A. Migration is one of the daunting tasks in case of technology centric business transformation where data transfer has to be facilitated between old and new systems (usually referred to as the Production Instance). This activity derives further complexity if data cleansing is also required prior to the migration. The key consideration in case of telecom operators is the fact that the volume of subscriber, product & transactional data is astronomically high. This is one of the opportune stages to optimize, cleanse and transfer the required data into the new system. One of the key challenges here is the strategy for ensuring limited or no impact on business as usual like customer billing or service availability. Migration is no less than a bypass surgery where the change has to happen while the system is live & running.

B. War room is one of the best practice approaches that are being adopted by leading telecom operators. While, the training is one of the key aspects that ensures success at the front-end (or user level); the war room prepares the organization for the battle at the back-end (or technology or process level). Select individuals are nominated and deployed in a dedicated setup facility to handle any challenges, defects, fallouts or escalations on a 24x7 basis. The war room maybe referenced as an Intensive Care Unit which is required till the system reaches the stabilization point or normal functioning resumes.

C. Go-live is the moment when the business transformation kicks-off or reaches the execution stage. In case of technology centric transformation it is the moment when the transition or change of tracks from old to new system happens. This is also referred to as the "cut off" process; and may also involve the integration with host of surround applications or systems.

Table 9: Guerrila War vs. Business Transformation

Stage	*Guerrilla War*	*Business Transformation*
I	**Organization:** • It involves the organization, consolidation and preservation of base areas usually in difficult and isolated terrain. • It includes socializing with the rural locals, winning their trust and recruiting them.	**Initiation:** • It involves building of the business case and presenting it to the key stakeholders and seeking their approval. • Key business resources are short-listed for inclusion in the business transformation.
II	**Progressive Expansion:** • Attacks are planned for heightened effect - primary to grab attention • Engaging in initial act of violence demonstrates to the people that the revolution is real and that the *Guerilla agents* mean business. • People become hopeful that a change maybe forth-coming	**Implementation:** • Project kick-off event is organized to beat the trumpet that the Program has started • *Change Agents* provide timely & periodic communication to the stakeholders / employees and maintain the buzz • Employees are forward-looking towards the transformation outcome.
III	**Decision or Destruction** • Adequate weaponry & soldiers are accumulated to gear up for the battle • Over time, more and more people join hands in the combat operations • Ultimately a regular military force emerges that can engage any institution on the field of battle	**Roll-out:** • Adequate preparations are made to ensure the go-live is successful (war room, pilot, etc) • Additional support is garnered from outside transformation team to support rollout • Transformational Change is initiated with the go-live

The rollout phase maybe referenced as launch of artificial satellite i.e. the duration starting with the positioning of a rocket at the launch station to the deployment of an onboard satellite on the right orbit in the outer space. The success of a rollout is defined only when the stabilization point has been realized. Post go-live there may be several occasions when things might go from bad to worse, and adequate mitigation steps has to be enforced to perform a course correction. When enemy at war holds the high ground, there is no bravado in rushing the horses to the death pit. Similarly, when things go out of control, then sound judgment must be applied to roll-back the system or business processes and reduce the business impact or risk. Needless to mention, it provides the fall back plan to introspect, re-plan and re-launch with greater vigor and preparation.

Few portfolios that transcend across multiple business transformation phases are as follows:

A. Program Management ensures planning and progress monitoring of the business transformation. Planning would encompass scope, timeline and resource requirements to facilitate the transformation; while periodic monitoring would ensure whether the program is being executed as per the defined objectives and within the pre-defined plan. Program Management performs the health-check of the program on periodic basis, highlights key dependencies or road-blocks and introduces risk mitigation measures from time to time. It also highlights key decisions or escalations that require the attention of the Steering Committee.

B. Change Management has emerged as a strategic tool that emphasizes the importance of "people aspect" within any business transformation. Hitherto this emphasis has been myopically being shown to the "impacted people"; however change management is a wider term and encompasses even individual who "can impact & influence" within the organization. Identification and alignment of such individuals with the overall objectives of the business transformation is crucial; so that they can in turn apply their sphere of influence to their team members. Training (explained earlier) is one of the facets of change management which mitigates the fear of unknown and equips the end-users for seamless transition. Communication Management is a potent tool to motivate and inform a team or

the entire workforce of an approaching "change" within the organization. Timely communication keeps them abreast about the transformation progress and generates the right buzz within the organization.

3.3. Guerrilla War vs. Business Transformation: An Uncanny Yet Pertinent Semblance

As mentioned earlier, Business transformation is like war. The art of guerrilla war throws key insights on how to win a battle and the stages thereof:

3.4. Critical Success Factors: Getting it First Time Right

Business Transformations are not like everyday projects; usually it is a "make or break" situation for the enterprise. Utmost priority should be given to such initiatives and some of the key considerations are as follows:

- **Strategy**: Business transformations should be planned with a 5-10 years horizon considering the time, energy, resource and above all the cost factor. In a complex transformation, while there can be multiple tracks however a single program plan should be defined and be available to all track leads or program managers. They should synchronize their micro activities to ensure timely catch-up with the overall project plan and milestones.
- **Warrior:** Business stakeholders should put form the best resources forward even if it is at the cost of Business As Usual (BAU). Only skilled warriors should go to the war and contribute to its success.
- **Torchbearer:** Key business leader should be made the Transformation Sponsor (especially in the case of technology led Business Transformations). The same would ensure the right commitment, direction and action towards the initiative.
- **Blessing of the Council:** Business Sponsor and other key stakeholders should be committed towards the transformation and provide necessary support and push as and when needed (and avoid political motives)
- **Single vs. Multiple Battles:** It's always easier to handle one business transformation rather than having inter-dependent and concurrent business transformations
- **Fact vs. Fiction:** Business Transformation objectives and timelines should be realistic and achievable.
- **Grounding:** Adequate preparation should be done prior to execution. Some of the tools being utilized by Telcos in this aspect includes:
- **Pilot (or soft launch)** launch with a small focus group or select geography prior to the big-bang launch.
- **Dry Run** in case of technology oriented transformation to ascertain a complete sanity check prior to the go-live.
- **Business Simulations** is extensively emerging as a strategic tool to gauge the degree of impact on end customer, trade partners, internal or outsourced employees and/or execution of the defined business processes. It encapsulates an end-to-end testing of a business (or system) process rather than a piecemeal approach adopted during UAT.

Table 10: Corporate View-point (Critical Success Factors)

Corporate View-point

Critical Success Factors for any Business Transformation Program (in order of priority):

- Effective Change Management (at all Levels)
- Alignment with Organization's Vision & Strategy
- Stakeholder Commitment
- Early Identification & Mitigation of Inter-dependencies
- Realistic Timelines and SMART Goals

- **Escape route:** Alternatives or fall back options should always be planned in the event things go out of control especially in case of multiple project dependencies or budgetary considerations.

4. Conclusion

Business Transformation is a critical battle an organization undertakes to bring about a radical change as dictated by the pressing internal or external business parameters. The overall Transformation journey goes through several activities before the business goal or objective can be achieved. And, several factors would be instrumental in scripting the success of a business transformation. Alignment of business stakeholders and key resources with the overall objectives is one of the most essential elements that need to be considered before undertaking a business transformation journey.

Management's biggest predicament may be centered on the art of optimizing and balancing it's time, resources and finances to support the business transformation. Commercial negotiations might be critical; organizations give more priority on Partner (or Product) selection during the "initiation phase" of a business transformation.

Once the management decisions are in place; much of the effort goes in getting the best resources or visionaries who would collaborate to define the overall construct of the transformation. Requirement elicitation, therefore, becomes the most critical activity within the "*implementation phase*".

The final leg of the business transformation is the "*Rollout phase*" which is a thin line between success and failure. Best efforts should be exercises for one last time to bring the required closure to the business transformation.

The two most strategic tools that organizations across the globe have been leveraging to ensure a seamless business transformation are: Program and Change Management. While, the former is very critical from the perspective of risk and issue mitigation and the smooth running of the transformation; the latter concentrates on rightfully addressing the impact of business transformation on the people. Like any military battle; it's the end outcome that decides the fate of the people and the kingdom; similarly the success of the business transformation dictates the success of an enterprise.

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Telecom Business Review

Volume 6 Issue 1 September 2013

ISSN: 0973-9114

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Journal is available online at www.publishingindia.com

Telecom Business Review

(Annual Journal)

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Telecom Business Review

A Journal of SITM (TBR) is an annual journal of Symbiosis Institute Of telecom Management. TBR is a referred journal with a process of double blind review

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ISSN 0973-9114

9 770973 911009 4

Symbiosis Institute of Telecom Management

(Constituent of Symbiosis International University (SIU). Established under Section 3 of the UGC Act 1956, by notification No. F 9-12/2001-U 3 of the Government of India)

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