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Requirement of Information Technology Transformation in Indian Telecom Industry

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Abstract

Information Technology (IT) Transformation can effectively reduce product cost, improve customer service experience, and increase enterprise competitiveness. However, the successful implementation of IT Transformation is very challenging and invites a huge effort in terms of cost, time and resources. There are a lot of factors (e.g. High implementation costs, technical complexity, lack of well-trained employees, lack of incentive mechanisms, etc.) resulting in slow pace and less investments in this domain.

Aiming at the key challenges like Customer Relationship Management (CRM) integration, Data Migration, Cost Control, Futuristic Fit, Mergers & Acquisitions, Increased System Complexity, Technology – Well-defined & estimated scope of work, Governance & Resource issues, Failure to monitor KPIs; Lack of well-defined process which are being faced by Telecom Operators; an IT Transformation framework is developed specifically in Enterprise Business Solutions domain.

IT Transformation methodology includes multiple process groups. The requirement of each process group is elaborated in this paper. Furthermore, a real time case of IT Transformation has been used to illustrate the proposed framework. This illustration also takes into account the relationships among IT system, business objectives, business processes, and business performances.

Key Words

IT Transformation, Operations Support Systems (OSS), Business Support Systems (BSS) Framework, Implementation Methodology.

INTRODUCTION

Telecommunication is the science of information transport using wire, radio, optical, or electromagnetic channels to transmit receive signals for voice or data communications using electrical means.

A typical Telecommunication Network comprises :-

- Access Network : The part of the Telecommunication Network from the Subscriber (Customer Premises Equipment) to the Switching facility.
- Switching Network : The part of a Telecom Network which connects to the Access Network and "switches" calls to the desired destination (in Access NW) as per dialed digits.....
- Backbone Network : That part of the Telecom Network which interconnects the "Switching Nodes"

TELECOM TRANSFORMATION

It is a term that describes the evolution of the telecommunications industry from a capital-intensive, technology-focused model to a user-centric service-delivery model. In order to maintain the market, the service providers are introducing new attractive services to the end-users, which require modifications to their current infrastructure (legacy infrastructure) into what is typically termed as a Next-Generation infrastructure. The process of converting or modifying the network elements, end-user services and business-processes of the service provider to achieve the competitive advantages offered by the newer technologies is known as Transformation.

Transformation Sub-Processes

The telecom transformation process is a combination of the following three sub-processes.

- Telecom Network Transformation : The Network Transformation sub-process refers to the activities adding new elements in the Core Network, Backbone network and Access network.
- End-user Services Transformation : This sub-process is aimed at ensuring that the services offered in the legacy network and availed by the end-users continue to be available during the transition phase and up to a planned future. This sub-process is also concerned with

introduction of new end-user services into the next-generation network.

- IT Systems Transformation: refers to the sub-process that involved in aligning the Operations Support System and Business Support System infrastructure with the transformed network. The typical set of activities that characterize this sub-process include:
  - — Streamlining Fulfillment, Assurance and Billing processes
  - — Rationalizing existing applications to merge, consolidate or retire systems
  - — Designing and implementing end-to-end solution

SUB-STACKS OF IT SYSTEM TRANSFORMATION

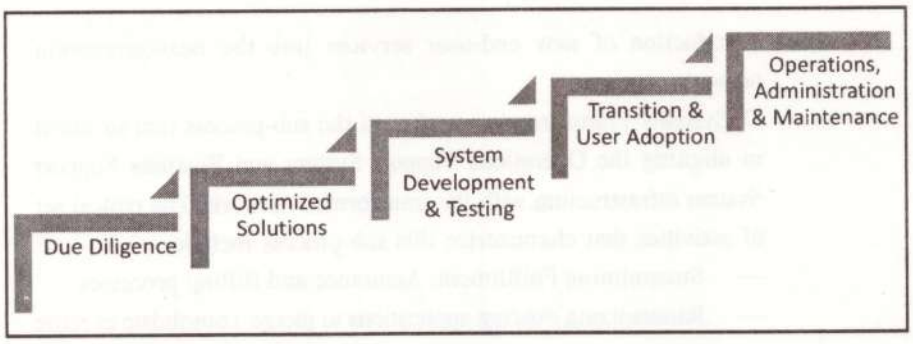
Operations Support Systems (also called Operational Support Systems or OSS) are computer systems used by telecommunications service providers. The term OSS most frequently describes "network systems" dealing with the telecom network itself, supporting processes such as maintaining network inventory, provisioning services, configuring network components, and managing faults.

Business Support Systems (BSS) : are the components that an operator uses to run its business operations towards customer. BSS and OSS platforms are linked in the need to support various end to end services. Each area has its own data and service responsibilities; The role of Business Support Systems in a service provider is to cover four main areas :

- Product Management
- Customer Management
- Revenue Management
- Order Management

IT Transformation Framework

Based on the connotation of IT Transformation Framework and the condition of Indian Telecom Operator's IT systems, we propose an IT Transformation framework of OSS/BSS implementation for Indian Telecommunication operating in Enterprise Solutions using Wire Technology, which includes 5 pillars, i.e., Due Diligence, Optimized Solutions, System Development & Testing, Transition & User Adoption, Operations, Administration and Maintenance.



OBJECTIVES OF THE STUDY

1. To consider the requirement of IT transformation in Indian Telecom Industry
2. To Identify and abatement of pain points across verticals
3. To analyze the Cycle time and Right First Time improvements across functions

METHODOLOGY

1. Systematic Random Sampling method is used for data collection. A questionnaire was prepared and data was collected fromFull Time Employees (FTE's) working on Service Fulfillment, Assurance & Billing and Product Management processes across below mentioned 5 Organizations.
   a. Reliance Communications Limited
   b. Bharti Airtel Limited
   c. Bharat Sanchar Nigam Limited
   d. Mahanagar Telephone Nigam Limited
   e. Tata Teleservices (Maharashtra) Limited

   These operators are being chosen based on customer base, operating circles and business growth with the Enterprise Product range
2. 323 FTE (Full Time Employees) of fixed line operators operating from National Headquarters, Network Operations Center and Circle Offices have been interviewed; these respondents covered the complete operational support processes and business support processes including customer relationship management, billing systems etc.
3. Primary Data collected via :
   a. Face-2-Face discussions
   b. Email communication

c. Online surveys and response
d. Audio conferencing with the different level groups.

4. Secondary data collected through webinars, online reports and websites.
5. Statistical analysis using Chi square and ANOVA are being used.

ANALYSIS AND FINDINGS

After analyzing the respondents' feedback and review comments below mentioned excerpts have been defined.

1. Analysis of IT Transformation Objectives

As per the received feedback most of the respondents opted for IT Transformation in Operational Efficiency followed by Increased Customer Satisfaction, Business Agility and Cost Optimization.

Figure 1 : Transformation Objectives

- **Operational Efficiency :** Landscape of Telecom processes encompasses the full spectrum of operational activities which are supporting the Lines of Business. In order to maintain better Service Level Agreements and Key Performance Indicators, most of the respondents have been responded for operational improvements by improving Infrastructure augmentation, system integrity, Business Process Re-Engineering, reducing Re-Keying etc.
- **Increased Customer Satisfaction :** This is the most important objective emphasizing on customer satisfaction pertaining to all the Process Verticals of Telecom Business, Improvement in Customer

Business requirement gathering, mapping between Business requirements and Functional requirement specifications, On Time Delivery, new fulfillments by increasing Right First Time and Right First Billing. For Service Assurance, User-Friendly Storefronts, reducing response time, mean time to repair and Product Management by reducing Time to Market with efficient Product Management systems.

- **Cost Optimization :** The most important reason for investing in IT Transformation is the cost optimization. Mostly the operators in Indian Telecommunications are towards cost optimization via system automation and thus reducing full time employees with the help of outsourcing and out-tasking. Further system augmentation, Project Management and Managed Services functions are being planned to outsource with aggressive Service Level agreement and Loss of Pay Contractual obligations.
- **Business Agility :** IT Transformation is a contributor to achieve changes in Business Environment like: adhering new regulations, new products launches, bandwidth allocations and permissions to expand the network, bundling solutions to end user with minimum system level investments.

2. Respondent Analysis for Favouring and Considering IT Transformation

A Chi square analysis is carried out on SPSS. It depicts that p value is more than 0.05 in both the above cases and hence null hypothesis is accepted that there is no difference in opinion regarding favour and consideration of IT transformation among operators. It has been observed that on all the baseline parameters like — Operator Level, Age of the Telecom Operations, Total Experience of FTE's and Current Experience of FTE's the trend towards "Favour of IT Transformation and its Consideration" is almost uniform. In general, 83% of people favour IT transformation and on similar lines 83% consider IT transformation in their company. Different operators have their own opinion. The Chi square value is insignificant. The trend shows that MTNL and TTML are less inclined towards the IT transformation. The result shows that despite difference in the opinion of the employees in relation to IT transformation, overall it is being considered in the Operators.

Table 1

Favouring and Considering IT Transformation

		Favour of IT Transformation				Considering IT Transformation			
		No		Yes		No		Yes	
		Count	%	Count	%	Count	%	Count	%
Operator	Bharti Airtel	11	20%	59	22%	11	19%	59	22%
	BSNL	16	29%	74	28%	16	28%	74	28%
	MTNL	10	18%	43	16%	10	18%	43	16%
	Reliance	11	20%	57	21%	12	21%	56	21%
	TTML	8	14%	34	13%	8	14%	34	13%
Co.Age	6-10 yrs.	6	11%	29	11%	6	11%	29	11%
	11-20 yrs.	24	43%	121	45%	25	44%	120	45%
	Above 20 yrs.	26	46%	117	44%	26	46%	117	44%
Tot.Exp	Up to 10 yrs.	24	43%	110	41%	25	44%	109	41%
	10-20 yrs.	16	29%	103	39%	20	35%	99	37%
	20 yrs. or above	16	29%	54	20%	12	21%	58	22%
Cur.Exp	Up to 5 yrs.	40	71%	160	60%	38	67%	162	61%
	5-10 yrs.	13	23%	94	35%	16	28%	91	34%
	10 yrs. or above	3	5%	13	5%	3	5%	13	5%

3. Automation of Service Assurance Activities

Being service industry, degree of automation in the Service Assurance activities plays an important role. Various service assurance activities like Fault Monitoring, Processing Fault Notifications, Root Cause Analysis, Fault Reporting, Bill Data Collection, Bill Data Processing, Bill Generation, Bill Collection have been identified.

Hypothesis : There is no significant difference in degree of automation of various service assurance activities. ANOVA is calculated and the results are as follows.

Table 2

Summary

Groups	Count	Sum	Average	Variance
Fault Monitoring	323	938	2.904025	0.96281
Processing Fault Notifications	323	864	2.674923	0.555487
Root Cause Analysis	323	796	2.464396	0.622176
Fault Reporting	323	868	2.687307	0.575832
Bill Data Collection	323	919	2.845201	1.000808
Bill Data Processing	323	975	3.018576	0.894064
Bill Generation	323	1169	3.619195	1.21168
Bill Collection	323	945	2.925697	0.578313

Table 3

ANOVA

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	264.9149	7	37.84498	47.29758	1.85E-63	2.013131
Within Groups	2061.176	2576	0.800146			
Total	2326.091	2583				

According to ANOVA Table, hypothesis is not accepted at 5% significance level implying that degree of automation varies in different service assurance activities. This indicates that different activities have different level of degree of automation. The data was obtained on five point Likert scale where higher score i.e. 5 meant higher degree of automation. So by observing mean values it can be inferred that Bill Generation activity has higher degree of automation and rest of all the activities need to follow IT transformation with automation as an objective.

4. Pain Points in the Current Line of Operations & Systems

Full Time Employees carried out various pain points in the current line of operations like manual report creation, maintenance of data, manual order, fault and billing management. Chi square test is applied to analyze the follows :

Hypothesis : There is no difference among operators in identified employee's pain points.

The calculated value of p is less than 0.05. Hence the hypothesis is

rejected that there is no difference among operators. There is a difference in the pain points among operators which is as follows :-

- More than 50% employees in BSNL and MTNL are putting 60-80 % efforts in manual report creation. However, in TTML, Bharti and RCoM manual reporting effort is less than 50 % for most of the employees.
- MTNL and BSNL employees are spending most of the time in Maintenance of Data Integrity. However, in rest of the operators it is at moderate level.
- More than 55% employees in BSNL and MTNL are dedicating 80-100 % efforts in Manual Order Management. However, in TTML, Bharti and RCoM this effort is less than 50 % for most of the employees.
- More than 70% employees in BSNL and MTNL are dedicating 60-100 % efforts in Manual Fault Management. However, in TTML, Bharti and RCoM this effort is less.
- TTML is leading with very less manual intervention for Billing Management. However, in BSNL, MTNL this is more than 60% manual effort.

5. Changes Required to Improve RFT (Right First Time)

A null hypothesis that there is no difference in the corrections needs to be done among operators is tested. Chi square test is applied and it is analyzed thatthere is no difference in the corrections needs to be done among operators is rejected at 5% level of significance. It is observed that TTML needs highest changes in the systems to achieve compliant Delivery with Right First Time, moderate in Bharti and Reliance. However, in MTNL and BSNL there are least number of changes are being required to achieve Right First Time.

6. Customer Complaints due to Failure or Non-satisfactory Services

A significant difference is observed in the number of complaints due to failure of services. In public sector, up to 50% complaints are for the said issue against 75% of complaints in private sector. No. of complaints received in government operators is less as compared to private players. Here we cannot ignore the products and the customer base for analysis.

7. Automation in the Service Fulfillment Activities

Being service industry, degree of automation in the Service Fulfillment

activities plays an important role. Various service fulfillment activities like Service Design, Service Cataloging, Inventory Management, Network Configuration, Capacity Assessment, Capture Service Order Request, Order Validation, Order Analysis, Order Fulfilment, Order Completion, Failed Order Management have been identified. Response has been captured for the degree of automation in Service Fulfillment activities on a scale of "1 to 5".

Hypothesis : There is no significant difference in degree of automation of various service fulfillment activities.

Table 4
Summary

Service Fulfillment Activities	Mean Values
Service Design	1.94
Service Cataloging	2.05
Inventory Management	2.36
Network Configuration	2.61
Capacity Assessment	2.05
Capture Service Order Request	2.27
Order Validation	2.77
Order Analysis	2.37
Order Fulfillment	2.38
Order Completion	2.42
Failed Order Management	1.89

Table 5
ANOVA

Source of Variation	SS	MS	F	F crit
Between Groups	247.52	24.75	16.77	1.83
Within Groups	5226.92	1.47		

According to ANOVA Table, hypothesis is not accepted at 5% significance level implying that degree of automation varies in different service fulfillment activities. This indicates that different activities have different level of degree of automation. So, by observing mean values it can be inferred that

Order Validation activity has higher degree of automation, rest of all the activities have less than moderate degree of automation which implies that most of Service Fulfillment activities need to be automated with the help of IT Transformation.

CONCLUSION

Consideration of IT Transformation across Telecom Verticals

- The result shows that despite difference in the opinion of the employees in relation to IT transformation, IT transformation is being considered in the companies. Operational Efficiency and Increased Customer Satisfaction are considered as a main objective of IT transformation.

Automation in the Service Fulfillment Activities

- It can be inferred that order validation activity has higher degree of automation, rest of all the activities have less than moderate degree of automation. It has been inferred that Bharti and TTML have higher degree of automation in service design, service cataloging activity. However, in MTNL and BSNL Service Design activities are manual.
- Bharti, TTML and Reliance have higher degree of automation in Inventory Management, Capacity Assessment and Capture Service Order and Order Validation Request activity in comparison with MTNL and BSNL
- Reliance has higher degree of automation followed by TTML and Bharti in Order Fulfillment activity in relation to other companies.
- Bharti and TTML have higher degree of automation in Order Completion and Failed Order Management activities in relation to other companies.

Automation of Service Assurance Activities

- Bill Generation activity has a higher degree of automation in all the operators than the rest of the Service Assurance activities.
- TTML have higher degree of automation in Fault Monitoring, Bill Data Collection, Bill Data Processing activities than other operators.

- BSNL has higher degree of automation in collection activity in relation to other companies.

Pain Points in the Current Line of Operations & Systems

- In most of the activities like Manual Report Creation, Maintenance of Data Integrity, Manual Order Management, Manual Fault Management and Manual Billing Management; MTNL and BSNL are investing maximum manual efforts as compared to other operators like TTML, Bharti and RCoM.

Changes Required to Improve RFT (Right First Time)

- It is observed that TTML needs highest changes in the systems to achieve compliant delivery with Right First Time, moderate in Bharti and Reliance. However, in MTNL and BSNL, there are least number of changes being required to achieve Right First Time. This can be due to standard product portfolio of BSNL and MTNL and less bundling solutions.

Customer Complaints Due to Failure or Non-satisfactory Services

- A significant difference is observed in the number of complaints due to failure of services. RcoM, Bharti and TTML responded with more customer complaints due to failure or non-satisfactory services. However, in MTNL and BSNL percentage of complaints are less in comparison.

RECOMMENDATIONS

- All operators should do the due diligence and work out the cost benefit analysis in their respective departments to prioritize the areas for IT Transformation requirement.
- IT Transformation will help in automating most of the Service Fulfillment activities across operators which are manual. MTNL and BSNL should focus on automating Service Design Activities, Inventory Management, Capacity Assessment and Capture Service Order and Order Validation Request.
- TTML and Bharti need to prioritize the automation in Order Fulfillment activity in relation to other companies.
- IT Transformation will help in automating most of the Service Assurance activities across operators which are manual. Except Bill Generation, rest of the Service Assurance activities need to be considered for IT Transformation

based upon Operator's priority.

- Most of the operators except TTML should prioritize the automation of Fault Monitoring activities, Bill Data Collection and Bill Data Processing. Except BSNL, all the operators have been recommended for more focus on automation in collection activities.
- In order to overcome various pain points like Manual Report Creation, Maintenance of Data Integrity, Manual Order and Fault Management; FTE's are required to focus on Business Development, Trainings & Learnings, Skill Enhancement etc. This has been recommended that operations and system pain points can be mitigated with considering IT Transformation so that FTE's can work on their core segments.
- IT Transformation will build-up efficient system augmentation with less number of changes on OSS and BSS stack. This is to implement new functions, enhanced products & services.
- The implementation of IT Transformation across service assurance function will certainly help the operators with improved service level agreements and Key performance indicators. Moreover, with Integrated Incident Management, Trouble Ticketing and Troubleshooting systems, the KCI's (Keep Customer Informed) process will be efficient enough to handle customers with fewer complaints.

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