Chapter 8 FINDINGS, CONCLUSIONS & RECOMMENDATIONS

8.1 Organization of the study

The main purpose of this study is to analyze IT Transformation strategy in telecom operators, operating in Enterprise solutions space which caters high value customers and SME’s (Small and Medium Enterprises) with Voice and Data solutions.

The idea is to evaluate the existing process, systems, issues, pain points, Competitive market imperatives and propose effective Operations support systems (OSS) and Business Support Systems (BSS) framework.

Chapter 1 described the basics of Telecommunications followed by the Introduction of Telecom and IT system Transformation including IT Transformation framework. Full Time Employees from leading wire line operators like MTNL, BSNL, RCoM, TTML and Bharti have been identified and System Random Sampling has been conducted to access the actual information and developing a framework for design, development, implementation and other related aspects of a suitable IT Transformation Framework. A pilot test of the composite questionnaire was conducted.

Chapter 2 illustrated the relevant case studies which have studied with
respect to Evolution of Telecommunication, studies related to IT Transformation in another segments and IT Transformation in Telecom industries.

Chapter 3 described the Questionnaire reliability tests which have been conducted and found that critical questions are highly reliable. In order to analyze the data, both simple as well as advance statistical techniques were applied. Simple techniques included frequencies, percentages, averages, etc., while the advance techniques included Chi Square Analysis, 1 - way ANOVA and 2 way ANOVA tests have been used.

Chapter- 4, 5, 6 and 7 reflecting the results and findings of the questionnaire Survey in accordance to the said objectives and interview study on the various issues related to the requirement of IT Transformation strategy, Challenges during IT Transformation, Base line parameters of IT Transformation and Impact Analysis of leading Wire line operators like TTML, BSNL, MTNL, Bharti and RCoM have been analyzed and documented. Further the respondents indicated their opinion towards the cross functional departments. All the respondents share their recommendations for designing an effective Operations and Business support systems.
8.2 Findings of study

The salient findings of the study are enumerated as below:

1. 44.27% respondents are Full Time Employees from Public Telecom Service Providers (BSNL, MTNL) and 55.73 % respondents are Full time Employees from Private Telecom Service Providers (Bharti Airtel, Reliance Communications, Tata Teleservices Maharashtra Limited).

2. It is observed that more than 70% of the FTE’s are working on service aspects, Rest of 30% focusing on Business Development and Business Operations which are more focused towards new opportunities, upselling and Revenue enhancements.

3. 76% FTE’s having an experience more than 5 years.

4. 83% of people favour IT transformation and on similar lines 83% consider IT transformation in their company, all the operators considering the implementation of IT transformation in most of the functional areas.

5. Operational Efficiency and Increased Customer Satisfaction are considered as a main objective of IT transformation.
6. Most of the Service Assurance activities are operating manually across operators however Bill Generation activity has a highest degree of automation in all the operators.

7. 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.

8. 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.

9. 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.

10. 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.
11. TTML is leading with very less manual intervention for Billing Management however in BSNL, MTNL this is more than 60% manual effort.

12. In MTNL and BSNL, up to 50% complaints are due to Non-satisfactory services against 75% in Bharti, TTML and RCoM jointly. No. of complaints received in government operators is less as compared to private players.

13. It has been observed that most of the FTE’s are involved into non-core activities like - manual report creation, Maintenance of Data Integrity, Manual Order Management, Manual Fault Management and Manual Billing Management; which consume most of their valuable time in manual activities.

14. Most of the operators struggling with Changes and corrections on OSS and BSS system stack to cater new products, improve compliant Delivery with 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. In MTNL and BSNL least number of Changes is being required to achieve Right First Time.

15. Less manual intervention for Billing Management is observed.
16. It is noticed that order validation activity has higher degree of automation, rest all of the activities are less than moderate degree of automation which implies that most of Service Fulfillment activities like service design, service cataloging, inventory management, capacity assessment, Capture Service Order, Order fulfillment, Order completion, Failed Order Management needs to be automated with the help of IT Transformation.

17. IT Transformation will directly impacting the Human resource function w.r.t the Capabilities like skill enhancement of existing employees, Internal or External Hiring’s, resource transition and Optimization, Staff Training & Skill Transfer, competence training for staff to acquire necessary knowledge and Operations administration and maintenance skills.

18. Data integrity across OSS and BSS functions also a concern as the data flows from one system to another based upon the attributes which further creates a challenge of Data migration with full of risks and issues.

19. The Governance function needs to be inclusive and integrated across the Program so that appropriate information is made available to the management team for executive decision making.
20. Benefits Management function required to ensure that IT Transformation meets its short term and long term operational improvement (reduced numbers of systems, reduced TCO, improved CE and SDK compliance) targets.

21. The complexity and scale of IT Transformation means that it will be faced with various risks, issues, assumptions and dependencies. The IT Transformation Program will impact the core processes (C2M, L2C and T2R), systems, operations and resources across Operators, resulting in unprecedented levels of change.

22. As per the systems blueprint, IT Transformation will potentially impact on a number of target audience groups within Operators and Customer Experience. One of the most important measures in evaluating the IT Transformation Program success is the end-user adoption of the new systems and processes introduced by the Program.

23. Solutions to adhere the 70:20:10 principles including maximize re-use of existing solutions and deploying COTS out of the box where general market availability and lead-times for deployment are not prohibitive.
24. Technical Base line parameters include number of changes and corrections on Operator’s IT Systems to enhance RFT, Data Integrity across Data Bases, customer validation at different storefronts and automation in Service Fulfillment and assurance activities.

25. It is observed that most of the Operators respond high to very high effect of efficiency of As Is Capture. Therefore it is imperative that all the Operators agreed to the fact that best capture of As Is process not only help in capturing Business As Usual however this is an important Base line for the IT Transformation strategy.

26. It has been observed that Average FTE's and number of Operational Support systems deployed in Account Management & Sales are almost in proportional with Service Delivery. Average number of BSS systems and Average Cycle time are very high in Service Delivery function which needs rationalization and optimization respectively. Moreover Customer Satisfaction score is marginally less than Satisfactory Level across all the functions.

27. It is observed that Average No of FTE's are more in Service Assurance function followed by Revenue assurance and retention and Billing. Average no of OSS systems are uniform in T2R function however
Business Support systems are more in Service assurance and Revenue assurance inviting system rationalization. Average Cycle Time is high in Service assurance however moderate in other functions. Moreover Customer Satisfaction score is marginally less than Satisfactory Level across all the functions.

28. In most of the Sales and Marketing functions like Product Marketing, New Launches, Marketing Strategies, It has been observed that Average No of FTE's are on higher side as compared with New Launches and Marketing strategies teams. Numbers of OSS and BSS systems are uniform across functions however Cycle time is on higher side for Product Marketing. Customer Satisfaction score is marginally less than Satisfactory Level across all sub functions.

29. 77% of respondents provide a feedback that the Customer validation repeated at every step if subscribers call at customer care/billing helpdesk/technical helpdesk; however 23% of respondents provide a feedback that there is no Customer validation repeated at every step if he/she calls at customer care/billing helpdesk/technical helpdesk it is response in successive follow ups.
30. Up to 60% of revenue is lost because of missed SLAs, Ongoing disputes on SLAs and Revenue Leakage issues among all operators.

31. It is observed that Right First Time is low in most of the sub process functions of Lead to Cash journey, however Billing function is leading with 30.66% as Right First Time followed by Account Management with 29.25% and Service Delivery with 27.61%.

32. It is observed that Right First Time is low in most of the sub process functions of Trouble To Repair journey; however Revenue Assurance is leading with 31.14% as Right First Time followed by Service Assurance with 31.00% and Billing with 24.70%.

33. Average Number of Service Requests per day has been captured and it has been inferred that approximately 79 Service Requests have been received by Service Assurance teams during a day.

34. Current response reflects that on an average time taken to close a Service Request is Five (5) days. This Mean Time To Provision (MTTP) is on the higher side.
35. More than 67 faults have been conceded by the Service Assurance teams in a day which need to be exponentially reduced. On an average it takes 2.91 days to close the received fault.

36. Existing Average number of Services across circles provided by an Operators are close to 6 in numbers.

37. More number of complaints lead to dissatisfaction among existing customers and cascaded to new users. It has been observed that on an average more than 37% complaints are received on account of failure or non-satisfactory services. It is observed that in public sector, up to 50% complaints are for the said issue against 75% of complaints in private sector.

38. Structured Questions on IVR as a part of Trouble to Resolve Process are not so effective which impacts the customer experience. Current feedback is 2.90 which is below than an average level.

8.3 **Objective wise conclusion:**

On the basis of survey questionnaire data analysis, findings of interview study and descriptive analysis of variables, the conclusions were drawn
objective wise.

8.3.1 Requirement of IT Transformation

- Consideration of Transformation across Telecom verticals:
  
  o IT transformation has been considering in all of the Operators. Operational Efficiency and Increased Customer Satisfaction are the main objective Vis a Vis Cost optimization and Business Agility are of less priority.

- Automation in the Service Fulfillment activities:
  
  o 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.
  
  o Reliance has higher degree of automation followed by TTML and Bharti in Order fulfillment activity in relation to other companies.
  
  o Bharti and TTML have higher degree of automation in Order completion and Failed Order Management activities in relation to other companies.
  
  o 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.
This is concluded that order validation activity has higher degree of automation across operators, rest all of the activities are less than moderate degree of automation.

- **Automation of Service Assurance activities:**
  - TTML have higher degree of automation in Fault monitoring, Bill data collection, Bill data processing activities than other Operators.
  - BSNL have higher degree of automation in collection activity in relation to other companies.

  This is concluded that Bill Generation activity has a highest degree of automation in all the operators than the rest of the Service Assurance activities like Fault Monitoring, Processing Fault notifications, Root Cause Analysis, Fault Reporting, Bill Data Collection, Bill Data Processing and Bill collection

- **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; public operators are putting extreme manual efforts as compared to private players like TTML, Bharti and RCoM.
• **Changes Required to Improve RFT (Right First Time)**
  o TTML needs highest changes in the systems to achieve compliant Delivery with Right First Time, which is moderate in Bharti and RCoM. In MTNL and BSNL, there are less Changes 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**
  o 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 compared to MTNL and BSNL.

**8.3.2 Challenges faced by Telco’s during IT Transformation**

• **Impact on Human resource function**
  - IT Transformation impacting the Human resource function w.r.t the Capabilities like skill enhancement of existing employees, Internal or External Hiring’s, resource transition and Optimization, Staff Training & Skill Transfer, competence training for staff to acquire necessary knowledge and Operations administration and maintenance skills.
**Data integrity**

- Average level of integrity is different for customer, commercial and inventory data and lowers than the moderate level. Commercial Data is scattered across the Operation Support Systems and Business Support Systems with Mean value of integrity is 2.70, Customer Data is also following the same trend with a Mean Value is 2.61 and Inventory data having a Mean value is 2.52.

- It is inferred that in Bharti and TTML, the level of Customer data integration is from moderate to high level. However in BSNL and MTNL, it is from lowest to moderate. RCoM shows low to moderate response.

- It is observed that in Bharti and TTML, the level of Commercial Data integration is from low to high level. However in rest of operators, it is from low to moderate.

- It is concluded that in Bharti and TTML, the level of Inventory Data integration is from low to high level. In BSNL and MTNL, it is from lowest to moderate level. In Reliance, it is low to moderate level.

**Data Migration**

- Data migration across OSS and BSS functions also a concern as the data flows from one system to another based upon the attributes which further creates a challenge of Data migration with full of risks and issues.
Governance

- The Governance function needs to be inclusive and integrated across the program so that appropriate information is made available to the management team for executive decision making. The scope and complexity of the IT Transformation program means that it requires very close coordination and management.

Managing Change and User Adoption

- The complexity and scale of IT Transformation means that it will be faced with various risks, issues, assumptions and dependencies. The IT Transformation program will impact on the core processes (C2M, L2C and T2R), systems, operations and resources across Operators, resulting in unprecedented levels of change.

8.3.3 Base Line Parameters for IT Transformation Strategy:

- Composition of Base line parameters:

  - Base line parameters for IT Transformation comprises of Business, Technical, Process parameters, Engagement & alignment with other programs and dependencies.

  - Business teams are engaged in validating the “To-Be” processes and providing details on specific business issues and requirements.
• Solutions to adhere the 70:20:10 principles including maximize re-use of existing solutions and deploying COTS out of the box where general market availability and lead-times for deployment are not prohibitive.
• Architecture to focus on demonstrating improvements on business parameters such as Full time employees, number of OSS, BSS, customer experience, cycle time and right first time.
• Technical Base line parameters include number of changes and corrections on Operators’ IT Systems to enhance RFT, Data Integrity across Data Bases, customer validation at different storefronts and automation is Service Fulfillment and assurance activities.

▪ As Is Effect:

• It is observed that most of the Operators respond high to very high effect of efficiency of As Is Capture. Therefore it is imperative that all the Operators agreed to the fact that best capture of As Is process not only help in capturing Business As Usual however this is an important Base line for the IT Transformation strategy.
• With efficiently captured operating model, the pain points across people, processes and systems can be addressed with a better approach. This will help management to put the proportionate focus for IT Transformation requirements across lines of business or departments.

▪ Shorten Time to Response:
Shorten the time to close a Service Request better for the Operator’s business therefore Service Request Closure Time is the process Base line parameter on which decision of IT Transformation can be taken.

- **Service Level agreements**

  - Service Level agreements depends upon the contact between the operator and customer, therefore faults due to network failure or service failure will impact the ongoing agreements and hence resulting into revenue losses. After the Root Cause Analysis of these faults it has been identified that most of faults across criticality e.g Critical, Major and Minor are due to internal systems of the operators and taking a long journey to fix the faults within the agreed SLA.

- **Customer Complaints**

  - The quantification of Non-satisfactory performance of Operators Products and Services is done with the help of complaints due to failure or non-satisfactory services. Therefore it has been treated as Process Base line parameter with the help of which Operators can decide the viability and level of IT Transformation addressing and mitigating customer pain.

- **Effective Operating Models**

  - Operating models will be aligned for business engagement. IT Transformation Program will engage with operating teams to establish a
group of SMEs that will support various activities throughout the life of the Program; where appropriate it will build on and align its activities to these Programs.

- It is crucial to manage and align the operational areas to ensure the successful delivery of the Program. These include Demand Management, Transition Management and Alignment with other Programs.

- The IT Transformation implementation framework for Program alignment activities will depend on the degree of alignment ("low touch", "IT Transformation had driven" or "full alignment") that is to be performed with the non-IT Transformation Program.

- Every operator operating in a different model and encompasses with unique dependencies which influences the Level of IT Transformation in that function.

8.3.4 Impact Analysis of IT Transformation

- Improved Operations & Systems

- It is concluded that with the mitigation of manual activities, work can be managed with less no's of Full Time Employees and also FTE’s can concentrate on their core functions.

- Less maintenance cost to partners and vendors managing the OSS and BSS Stack.
• Deployed Systems will support Scalable Business Model, hence very less system augmentation requirements.

• New Business, Product requirements will be catered without Change Management.

  ▪ Revenue growth with the improved SLA’s

During Operations and maintenance, up to 60% revenue is lost due to missed SLAs, Ongoing disputes on SLAs and Revenue Leakage. The results show that in TTML, up to 40% of loss is due to ongoing disputes and in RCoM it ranges from 20% to 60%. Except RCoM, 40% Revenue leakage loss is calculated among operators.

  ▪ Revenue realization with Right First Time

It is observed that Right First Time is low in most of the sub process functions of Lead to Cash journey, however Billing function is leading with 30.66% as Right First Time followed by Account Management with 29.25% and Service Delivery with 27.61%. However Revenue Assurance is leading with 31.14% as Right First Time followed by Service Assurance with 31.00% and Billing with 24.70%.

  ▪ Upselling

It has been inferred that approximately 79 Service Requests have been received by Service Assurance teams during a day and on an average time taken to close a Service Request is Five (5) days. Moreover 67 faults
have been conceded by the Service Assurance teams on daily basis with 2.91 days to close the received fault.

- **Customer Validation**

  77% of respondents provide a feedback that Customer validation repeated at every step if he/she calls at customer care/billing helpdesk/technical helpdesk; however 23% of respondents provide a feedback that there is no Customer validation repeated at every step if he/she calls at customer care/billing helpdesk/technical helpdesk it is responded in successive follow ups.

- **Customer complaints**

  It is observed that in public sector, up to 50% complaints are for the said issue against 75% of complaints in private sector. Since No. of complains received in government s is less as compared to private players.

- **End User Experience**

  IT is imperative that Structured Questions on IVR as a part of Trouble to Resolve Process are not so effective which impacts the customer experience. Current feedback is 2.90 which are below an average level.
8.4 OBJECTIVE WISE RECOMMENDATIONS:

On the basis of survey questionnaire data analysis, findings of interview study and descriptive analysis of variables, the Recommendations were drawn objective wise.

8.4.1 Recommendations for the Requirement of IT Transformation.

- All operators should do the Due diligence and work out the Cost Benefit analysis in their respective departments to identify and prioritize the areas for IT Transformation requirement.

- IT Transformation will help in automating the 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.

- IT Transformation will help in automating the 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.
8.4.2 Recommendations for the Impact Analysis of IT Transformation

Operators should focus on FTE’s skill development so that the performance in core functions can be improved in correlation with Operator and Employee satisfaction.

- Operators should carry on Continual monitoring and controlling of TCO (Total cost of ownership) for OSS and BSS functions.
- With IT Transformation Fault management process will be more efficient and hence increases the System and Service Uptime triggering revenue growth with minimal penalties.
- After incorporating IT Transformation, the SLA and KPI’s can be measure transparently and less SLA conflicts resulting into less payment holdings and improvement in Revenue booking and realization.

- All operators should focus on Right First Time (RFT) improvements across functions to secure One Time deployment fees (activation fee) & earliest Billing Trigger. Moreover improvement in System and Service Uptime will earn the Bonus points and increased revenue share from customers.
- It is imperative that with the implementation of IT Transformation there would be increase in Service Requests mainly due to Fast Time to Market, Product Bundling’s, and Upselling with the existing customer.

- Operators should focus on Single time Validation with Common Customer Interface irrespective of the queries, Compliant and requests. Structured questions will result in efficient basic troubleshooting and improve the customer experience in Fault handling and resolution.

8.4.3 Recommendations for the Challenges faced by Telco’s during IT Transformation

- Operators should focus on FTE’s skill development so that the performance in core functions can be improved in correlation with Operator and Employee satisfaction.

- Operators should carry on Continual monitoring and controlling of Benefits management which are in scope of IT Transformation.

- Transition and Transformation programs needs to be aligned to ensure that there is minimal impact on Business As usual due to Data integrity and migration issues.
- A central Transformation Program Management Office will be established to facilitate various functions, track progress and ensure regular reporting. Identification and abatement of Risk analysis should be a mandate within each work package of the IT Transformation Program.

- Benefits Management function required to ensure that IT Transformation meets its short term and long term operational improvement (reduced numbers of systems, reduced TCO, improved CE and SDK compliance) targets.

- One of the most important measures in evaluating the IT Transformation program success is the end-user adoption of the new systems and processes introduced by the program.

### 8.4.4 Recommendations for the Base line Parameters for IT Transformation Strategy

- During IT Transformation initiation stage, Operators should focus on aligning Business parameters with Technical cost effective solutions and achievable process functions.
- IT Transformation programs need to be aligned with other Programs within operators to ensure that there is minimal impact on Business As usual due to Data integrity and migration issues.

- Reusability of existing systems needs to be taken care on priority and strong business cases needs to be worked out for new procurements with Cost Benefit Analysis.

- Key Responsibility Areas of FTE’s need to be clearly identified and measure w.r.t the core Business functions like Service Delivery Team members should be responsible for achieving Right First Time and Service Assurance Team members should be accountable for more Uptime with less SLA penalties.

- All operators should focus on Right First Time (RFT) improvements across functions to secure One Time deployment fees (activation fee) & earliest Billing Trigger. Moreover improvement in System and Service Uptime will earn the Bonus points and increased revenue share from customers.
8.5 Future scope of research

In order to achieve the goals of reduction in Operational expenses, improved customer satisfaction, reduced Cycle time and improve Right First Time and quick time to market, IT Transformation strategy is mandatory for operators which will help to enhance the Business with minimum incurred costs. This will help operators to consolidate the Operations and Business support systems and move from Be spoke approach towards the Transformed stack which will support Product and Service roadmaps too.

Lists of recommendations have been made as the result of the present study of the Indian Telecom Operators working in Enterprise space and the opinion survey conducted. These recommendations will be helpful to the Telecom Operators in other segments for undertaking the IT Transformation projects. The Operators which are already making use of the information technology Transformation strategy in selected operations may also get benefited by the following recommendations. The future studies may be focused on the following areas:

- Cost and Benefit Analysis of IT Transformation in Indian Telecom operators:
  - Further research can be conducted on evaluating the costing analysis of IT Transformation across Lines of Business and also
the projections of revenue enhancement can be worked upon. This can be followed with the Work Breakdown structure approach and each work package can be independently evaluated for Cost Benefits.

- **IT Transformation for Mobility considering VAS solutions**
  - Implication of SMAC (Social, Media, Analytics and Cloud) can be studied to improve the Revenue Sharing for Mobile VAS solutions
  - Multivendor Managed Services (MVMS) can be studied to optimize the Operational fee

- **Comprehensive & sponsored study with complete census of one operator** can be undertaken. Survey feedback should be mandatory for the entire employee working in Enterprise Business Solutions. This is to analyze the real time need and impact of IT Transformation w.r.t each department.