

Benefits of Outsourcing the ICT Infrastructure

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Abstract

Over the years the Telecom Industry in the country has shown a lot of progress in terms of infrastructure development coupled with the availability of telecom services. This has however led to the cut throat competition among various operators thus leading to reduced tariffs to the customers. The profit margins have seen a reduction thus leading the operators to think of other avenues by adopting new models while keeping the quality of service intact.

The outsourcing of the network and the resources is one such model which has shown promising benefits which includes lower costs, less risk, higher levels of customer support and engagement, predictable expenses, access to the emerging technologies, benefiting from a highly skilled workforce, adaptability, focus on the core business while reducing capital costs.

A lot of research has been done on outsourcing in terms of reasons of outsourcing and its benefits. However this study is an attempt to analyze the effects of the outsourcing on an organizations performance (Telecommunication Sector) considering the

variables (1) Cost Reduction (2) Organizational Performance (3) Flexibility (4) Employee Performance (5) Access to Specialized Skills & Technology and the (6) Outsourcing Risks.

1. Introduction

1.1 Network Types

Basically all the networks fall under these two broad categories:

- (a) Land Line Network
- (b) Wireless Networks

The landline network includes the legacy Public Switched telephone Network (PSTN), Coaxial Network, IP TV, Digital Subscriber Line (DSL), Integrated Services Digital Network (ISDN) and finally the high speed Optical fiber Network, Fiber in the loop (FITL) which is further categorized into Fiber in the Curb (FTTC), Fiber to the Building (FTTB) and Fiber to the Home (FTTH).

On the wireless side, we have Digital Radios, Mobile Communication, Spread Spectrum, Microwave and Free Space Optics. In short, the networks which include the physical wires are called the guided medium networks and the unguided medium networks are the ones where the propagation of data/voice is through the air interfaces/frequencies.

Recent diffraction in the networks has also added the Next Generation Networks which have in turn resulted in the requirement of less human resources, lesser costs and more

efficient setup as compared to the legacy networks.

Following are some of the networks architectures in place.

- **Public Switched telephone Network (PSTN)**

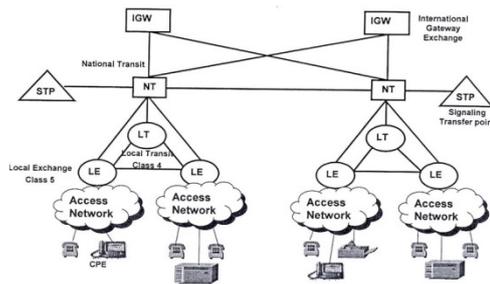


Figure 1: A Typical Network architecture of PSTN showing different access points.

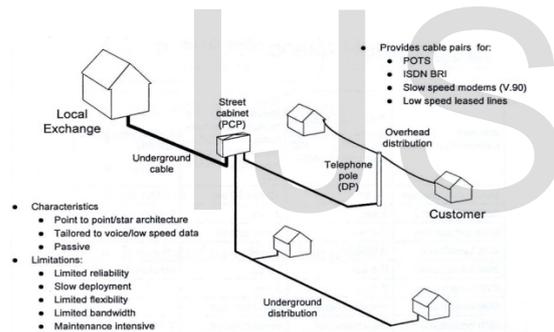


Figure 2: A network access scenario from the customer premises to the local exchange.

- **Digital Subscriber Line (DSL)**

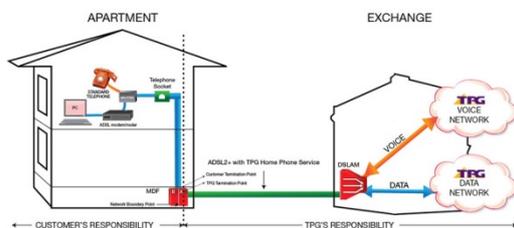


Figure 3: DSL network architecture.

- **IP TV**

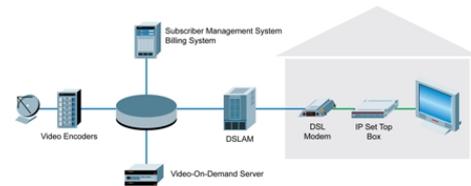


Figure 4: IP TV network

- **Optical Fiber Network**

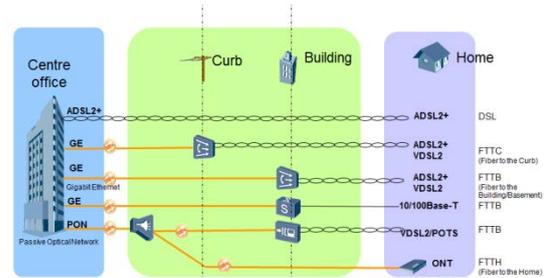


Figure 5: FITL, FTTC, FTTB & FTTH

- **Next Generation Network**

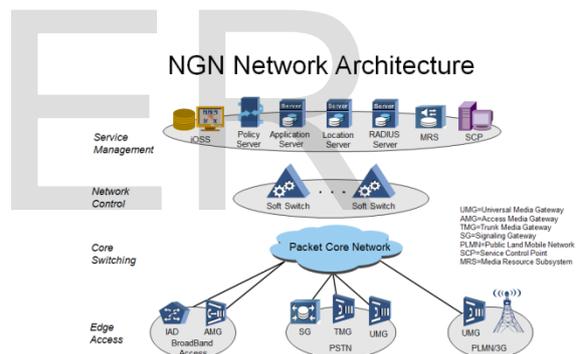


Figure 6: Next generation Network (NGN)

The evolution and the deployment of Next Generation Networks have changed the overall telecom networks dimensions. The cost reductions, enhanced quality of service and easy manageability are some of the features of these networks.

And finally on the wireless side we have the main cellular networks having the following typical infrastructure:

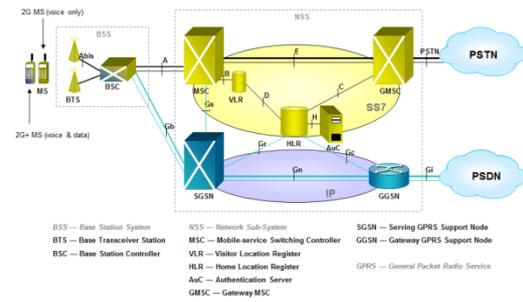


Figure 7: A typical Mobile Network including the Data Access patching.

1.2 Telecom Market Analysis

Over the years the Telecom Sector in the Country has shown remarkable progress, may it be wire line networks or the wireless communications. The Tele density in terms of percentages for the fixed local Loop, Cellular Mobile and Wireless local Loop has shown phenomenal increase reaching 75.21% by 2013 (Figure 8).

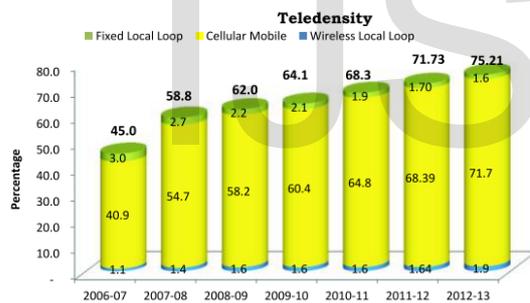


Figure 8: Tele density (Fixed Local Loop, Cellular Mobile & Wireless local Loop)

This has translated into increase in Telecom revenues reaching 440.20 Billion Rupees (Figure 9).

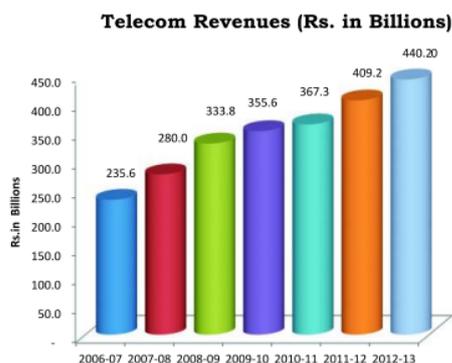


Figure 9: Telecom Revenues

It is not out of place to point out here that the telecom sectors contribution to the national exchequer is substantial thus helping in the growth of the overall economy of the country as per the statistical data available with Federal Board of Revenue.

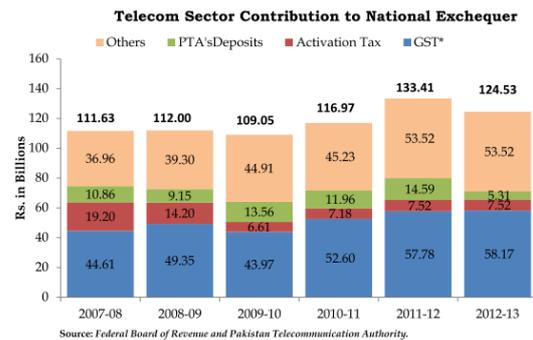


Figure 10: Telecom Sector Contribution to National exchequer

Seeing the potential and the lucrative market indicators, a lot of investment has been made by national and multi-national companies. Table 1 indicates a figure of 471.4 Million US\$ investment coming in the year 2012-2013 as per Pakistan Telecommunication Authority (PTA) data. Figure 11 shows Foreign Direct investment in the Telecom Sector alone.

	Telecom Investment						US\$ (Million)
	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	
Cellular	2,337.7	1,229.75	908.8	358.6	211.8	421.5	
LDI	403.9	276.75	183.1	108.7	13.3	1.9	
LL	342.1	57.37	22.5	18.2	5.0	16.1	
WLL	52.8	82.11	23.0	7.6	7.3	11.9	
Total	3,136.4	1,645.98	1,137.51	493.25	237.5	471.4	

Table 1: Telecom investment in the country



Figure 11: Foreign Direct Investment.

Furthermore, as most of the telecom infrastructure requires equipment procurement, hence the imports have seen enormous kick over the years.

	2008-09	2009-10	2010-11	2011-12	2012-13
Cellular Mobile sets with Battery	129.7	169.23	218.2	465.3	
Other Telecom Apparatus	570.4	556.45	548.1	488.7	
Total Telecom Imports	700.0	725.68	766.3	954.05	

Table 2: Telecom Equipment Imports

The most promising sector however remained the cellular industry which has penetrated/Accessibility into almost every nook and corner of the country with 71.7 % penetration rate.

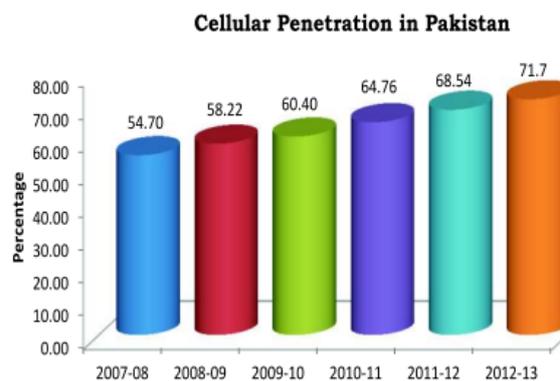


Figure 12: Cellular/Mobile penetration Rate in Pakistan.

The cellular users have reached a figure of 128.3 million with exponential growth still going on.

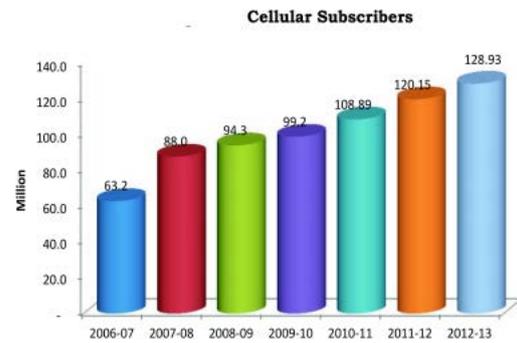


Figure 13: Cellular/Mobile Subscribers in the country.

At present there are five mobile operators in the country which include Mobilink, Ufone, CMPak, Telenor and Warid. The market share of each is shown in Figure 14.

	Mobilink	Ufone	CMPak	Telenor	Warid	Total
2008-09	-2,895,524	1,904,267	2,435,813	2,767,940	2,396,878	6,609,374
2009-10	3,065,708	-455,607	317,717	2,905,092	-955,049	4,877,861
2010-11	1,175,614	984,687	4,223,405	2,868,858	456,111	9,708,675
2011-12	2,575,273	3,363,474	5,909,290	3,296,644	-3,887,962	11,256,719
2012-13	1,168,437	678,767	4,207,336	3,552,100	-793,482	8,813,158

Table 3: Mobile Subscribers (Individual Operators)

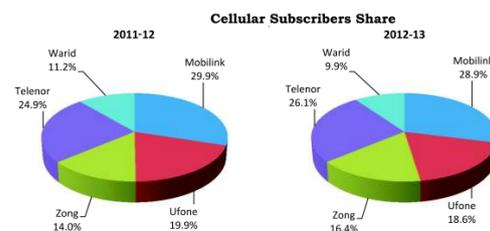


Figure 14: Cellular subscribers Market Share.

The cell sites have increased from 8,705 in 2005-6 to 35,889 in 2012-13.

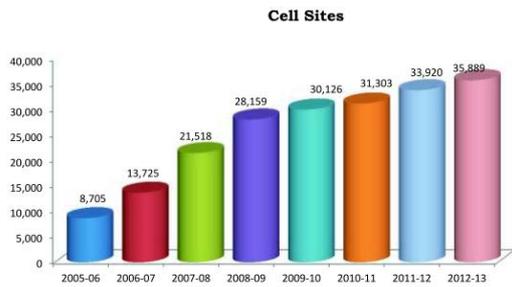


Figure 15: Mobile/Cellular Cell Sites increase.

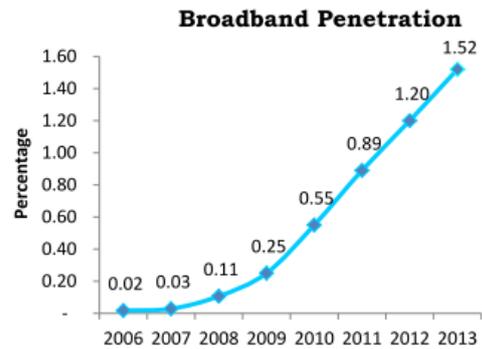


Figure 18: Broadband Penetration in Pakistan.

Apart from the cellular side, the rest of the infrastructure/services have also shown remarkable progress which includes the Local Loop Teledensity, Local Loop Subscribers, Broadband penetration, Broadband Subscribers, Broadband Operators Market Share, Broadband Technology Trends along with Broadband Global Trends (Figures 16 through 22).

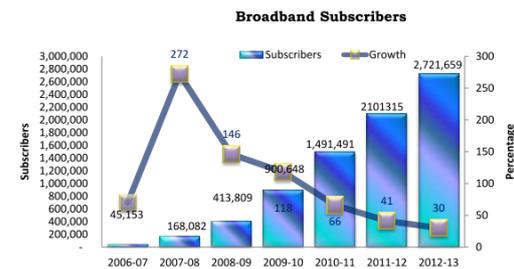


Figure 19: Broadband Subscribers in Pakistan.

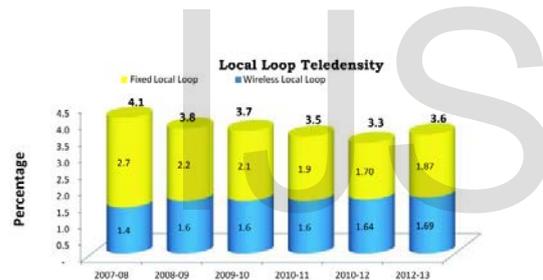


Figure 16: Local Loop Tele Density.

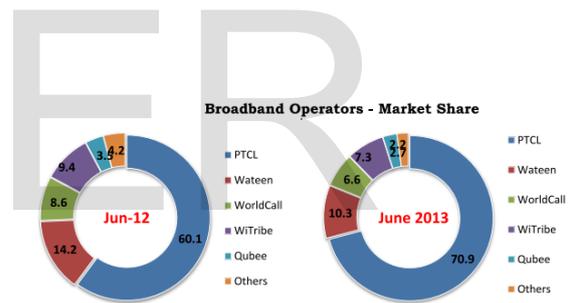


Figure 20: Broadband Operators Market Share.

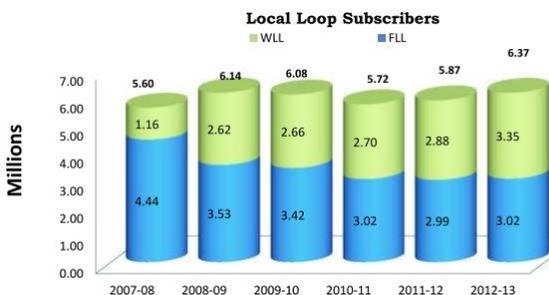


Figure 17: Local Loop Subscribers

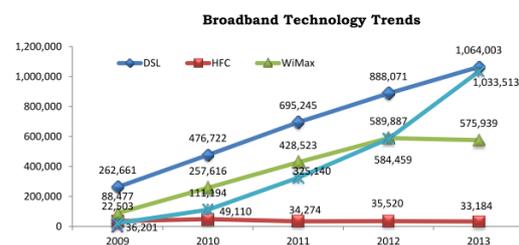


Figure 21: Broadband Technology Trends.

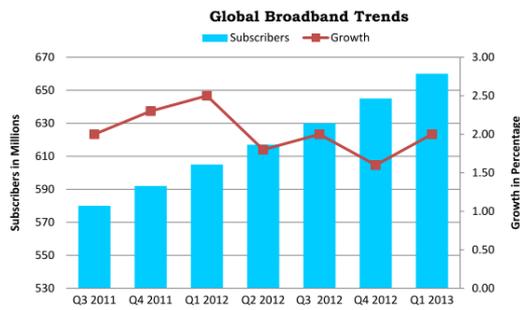


Figure 22: Global Broadband Trends.

It will be important to also have a look at the global ICT development trends in various categories of telecom deployments (Figure 23).

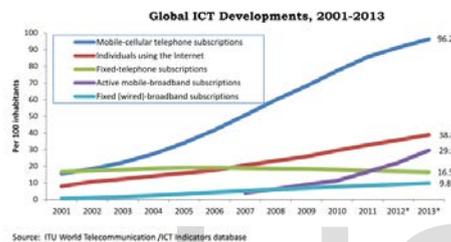


Figure 23: Global ICT Developments for various technologies.

1.3 Research Motivation and Challenges

Looking at these growth parameters, it is all the more important to concentrate on this sector. As the result of this massive development, the affect has been the reduction in tariffs thus reducing the profit margins with cut throat competition. The motivation behind this research stems from this challenge of looking at outsourcing avenues and opportunities which will lead to optimization of the resources thus sustainability for these operators in the long run. It is a big challenge which needs to be looked into else many countries have seen big players vanishing from the marked in a very short span because they

failed to realize the changing dynamics and remained stagnant to the market evolutions.

1.4 Challenges

Currently Telecom Infrastructures Outsourcing is very critical research area with optimal resources allocation being a key challenge for the telecom networks. There are a number of challenges which needs to be looked at for the implementation & adoption of the outsourcing models because these are ever evolving dynamic floating variable dependent models.

2. Premise of Research

2.1 Research Problem

The research is aimed towards the Telecom industry of Pakistan where a number of multinational operators and vendors are doing huge investments for the provisioning of telecom facilities and are involved in executing a number of projects in collaboration with local and virtual team's formations including multinational and multicultural environments. There is no focused research ever carried out to ascertain the viability of the outsourcing to avoid failures and achieve success.

2.2 Aims and Objectives

The main objectives of our research are:

- 1) To calculate the influence of the outsourcing on employee performance.
- 2) To calculate the influence of the outsourcing on organization performance.
- 3) To design a Model.

Though we came across many factors that form the basis for outsourcing, however the following six parameters have been analyzed.

- (a) Cost Reduction
- (b) Organizational Performance
- (c) Flexibility
- (d) Employee Performance
- (e) Access to Specialized Skills and Technology
- (f) Outsourcing Risks.

2.3 Research Methodology

Questionnaire will be floated among the Top Management of Telecom Sector. The intended audience/respondents will be from Telecommunication Sector of the country. The respondents must be working in the Telecom sector with the exposure to the outsourcing environment. Questionnaire will be distributed among the Project Managers to ascertain the impact of cost effectiveness, flexibility, access to specialized skills & technology, employee performance gained through outsourcing and outsourcing risks on organizations performance. Question will be a statement followed by a 5 point Likert scale i.e. Strongly Agree (marked "5") to Strongly Disagree (marked "1").

3. LITERATURE REVIEW

3.1 Background

The latest innovations/developments in information and communication technology (ICT) have directed the world community to embrace concept of outsourcing while encouraging them to embrace the principles which enables companies to extend & expand

their markets. In today's world outsourcing has becoming more and more important with new avenues for the generation of businesses coupled with value added services. Outsourcing is defined as "the process of purchasing goods and services from external service provider rather than producing the same goods or providing the same services within the organization" (T.I, 2005) ¹. We will call the outsourced services company or the institution as a vendor & the company looking for such services as the client.

The earliest information systems (IS) outsourcing was done in sixties when Electronic Data Systems (EDS) was engaged by Blue Cross Company located in Pennsylvania. Blue Cross not only outsources the IT Services but also handover the management task to EDS (Dibbern et al., 2004) ². Outsourcing accelerated in 1980s and 1990s (Kakabadse and Kakabadse, 2002) ³ when Kodak effect took place in which Kodak signed the agreement of \$1 Billion with International Business Machine (IBM) to build the datacenter, Businessland to take over the microcomputer operation of Kodak and Digital Equipment Corporation (DEC) to take responsibilities of its telecommunication and data network part (Loh and Venkatraman, 1992) ⁴. Outsourcing is now becomes an acknowledged dimension of corporate strategy.

Since then, lots of money has been spent on the outsourcing models development with IT companies in the forefront to adapt this focused direction. One of the main causes of outsourcing is the gain of profit from operational cost reduction (Juntiwasarakij,

2008) ⁵. US market from all form of outsourcing grew 20% between 1999 to 2000 (Casale, 2000) ⁶.

Outsourcing is a hierarchical chain of decisions. The vital element is to decide which set of capabilities to develop among partners and which to develop in-house. This decision strongly affect in maintaining the relationships between vendor and client (Beaumont and Sohal, 2004) ⁷. In an outsourcing the only exception is the software or computer application that gives an ultimate advantage to the organization. It hardly takes importance whether to purchase or engage a module or whether to run it in-house or on vendor's machine (Beaumont and Sohal, 2004) ⁸.

Developing countries' adopting the outsourcing as an alternative way for accessing the resources required to implement IT/IS functions successfully (Waheed and Molla, 2004) ⁹. Pakistan's IT/IS industry came into existence in 1977, when the private entrepreneur formed a software development firm named as Software Limited in Lahore. Looking at this, the people involved in IT must work hard to get Pakistani cities on the outsourcing map nationally and internationally ¹⁰.

3.2 Framework in the light of Literature

Review

The following six parameters have been analyzed.

- (a) Cost Reduction
- (b) Organizational Performance
- (c) Flexibility
- (d) Employee Performance
- (e) Access to Specialized Skills & Technology
- (f) Outsourcing Risks.

(a) Cost Reduction

Your first and foremost challenge pertains to the reduction of costs. This is a critical parameter. However there is a need to also create a balance so as not to kill the innovation with our zeal to reduce the costs thus choking the growth. As outlined by Beaumont & Sohal, 2004/Behara, 1995, cost uncertainty can be avoided by contracting/shrinking services at some fixed cost/unit. ¹¹

(b) Organization Performance

Organization Performance is a key indicator of an organizations accomplishment which relate to the active involvement of all the key employees in an organization. It was specifically outlined by Juntiwasarakij (2008) ¹². The work and the dedication of the work force manifest it-self and is reflected in the organizations performance. This translation is the key to the success of any organization.

(c) Flexibility

We can also refer to flexibility as scalability, in short, expanding/reducing (whichever is applicable) according to the specific focused requirements. Outsourcing introduces flexibility in the organization which then helps in orchestrating an effective organization keeping in view changing business environment. Modularity and bending approach towards companies working brings in the very concept of innovation which non-flexible companies do not

exhibit. The flexible approach has many hidden benefits which become visible with a passage of time.

(d) Access to Specialized Skills and Technology

In today’s world, the only edge which a company can have over others is the availability of the skill sets combined with the availability of the trained human resource, equipped with right technological tools. Knowledge, expertise, proficiencies and experience are the essential components which can effectively distinguish one company from the other.

(e) Access to Specialized Skills and Technology

Certainly, outsourcing is a risky proposition and has its positive and negative consequences. However risk mitigation is one approach whereas a step by step approach is adopted thus reducing the chances of any failures. More importantly, fearing risk and holding on to all the resources and infrastructures in hand also results in excessive costs thus rendering the risk of total collapse. A calculated risk approach in outsourcing provides the right answer.

4. **Data Collection & Analysis**

4.1 **Questionnaire**

Thirty (30) questions were developed which come under six (6) variables/attributes of cost

effectiveness, flexibility, access to specialized skills & technology, employee performance gained through outsourcing and outsourcing risks on organizations performance. Five point Likert scale ranging from Strongly Agree (marked “5”) to Strongly Disagree (marked “1”) is used. They were distributed among the relevant managers of the respective organizations.

Following is the format:

Scale	Description	Weightage
1	Strongly disagree	1.25
2	Disagree	2.50
3	Neither agree/nor disagree (Neutral)	3.75
4	Agree	4.50
5	Strongly agree	5.0

Table 4: 5-Point Likert Scale

Following is the questionnaire which was distributed.

Questions
Cost Reduction
Do you think outsourcing will reduce capital costs
Will outsourcing reduce capital expenditures
Will the financial health of the company improve with outsourcing
Will there be control on resources pilferage through outsourcing
Will the financial health of the company improve by reducing HR costs
Organizational Performance
Will outsourcing lead towards better organizational performance
Will the Quality of Service Improve
Will Concentration on core business functions improve

Will establishing strategic partnership with outsourced vendors be beneficial
Will the reput of the company improve with outsourcing of certain domain functions
Employee Performance
Will the workers be able to manage the company more effectively with outsourcing
Will outsourcing Motivate the employees
Work load will reduce with outsourcing
Will there be a more focused approach with outsourcing
Will employees feel insecure with outsourcing
Flexibility
Will diversification through outsourcing create more secure infrastructures.
Will there be more redundancy with outsourced infrastructures
Will the company will benefit from having multiple outsourced functions
Will scalability be achieved through outsourcing
Will dependence on various company deployments be reduced with outsourcing
Access to Specialized Skills & Technology
Will there be higher chances of gaining information
Will it help in acquiring specialized expertise and knowledge
Will it help in accessing to professional resources and capacities
Will help in gaining advanced technology and management experience
Will outsourcing help in having a better organizational form
Outsourcing Risks
Will outsourcing help in decreasing and sharing risks
Will outsourcing lead to losing control
Will there be more legal disputes with outsourcing
Will outsourcing lead to less innovation
Dependence on outsourcing will compromise secrets of the company

excellent reliability; 0.7-0.9, high reliability; 0.5-0.7 moderate reliability and less than 0.5 pertains to low reliability)

4.2 Sample Size

Total No of Questionnaire's distributed = 50

Invalid = None

Following is the distribution list:

Telecom Industry	Frequency
Mobile Operators	
Mobilink	5
UFone	5
Telenor	5
CMPak (Zong)	5
Warid	5
Network Providers	
PTCL	10
Wateen	5
Worldcall	5
Witribe	5
Total	50

Table 5: Composition of Sample

4.3 Data Analysis

After the collection of the questionnaire from the respondents, a detailed/in-depth analysis was carried out. Table 6 shows the respondent's answers against each question. 5

Reliability test was applied to check the reliability of data. SPSS was used was used to check the reliability of the collected data. Cronbach's Alpha value achieved was 0.812 which is above 0.7, which shows high reliability of data (Standard: 0.9 and above,

point Likert scale is used to see the outcome.

Slr#	Questions	Strongly Disagree (1)	Disagree (2)	Neither Agree nor Disagree (3)	Agree (4)	Strongly Agree (5)
1 Cost Reduction						
a	Do you think outsourcing will reduce capital costs	1	4	6	15	24
b	Will outsourcing reduce capital expenditures	3	5	7	10	25
c	Will the financial health of the company improve with outsourcing	4	5	6	15	20
d	Will there be control on resources pilferage through outsourcing	5	5	5	15	20
e	Will the financial health of the company improve by reducing HR costs	4	5	8	9	24
Sub Total 1		7%	10%	13%	20%	48%
2 Organizational Performance						
a	Will outsourcing lead towards better organizational performance	5	1	9	13	12
b	Will the Quality of Service improve	3	5	7	15	20
c	Will Concentration on core business functions improve	1	7	9	10	23
d	Will establishing strategic partnership with outsourced vendors be beneficial	5	5	8	15	17
e	Will the repute of the company improve with outsourcing of certain domain functions	4	5	8	10	20
Sub Total 2		7%	8%	10%	22%	42%
3 Employee Performance						
a	Will the workers be able to manage the company more effectively with outsourcing	1	7	9	11	22
b	Will outsourcing Motivate the employees	5	2	9	22	12
c	Work load will reduce with outsourcing	4	5	8	15	18
d	Will there be a more focused approach with outsourcing	1	7	9	11	22
e	Will employees feel insecure with outsourcing	10	5	14	15	18
Sub Total 3		8%	10%	20%	30%	37%
4 Flexibility						
a	Will diversification through outsourcing create more secure infrastructures	1	4	6	20	19
b	Will there be more redundancy with outsourced infrastructures	3	5	7	15	20
c	Will the company will benefit from having multiple outsourced functions	4	5	8	15	18
d	Will scalability be achieved through outsourcing	1	7	9	11	22
e	Will dependence on various company deployments be reduced with outsourcing	4	5	8	15	18
Sub Total 4		5%	10%	15%	30%	39%
5 Access to Specialized Skills & Technology						
a	Will there be higher chances of gaining information	1	4	6	10	29
b	Will it help in acquiring specialized expertise and knowledge	5	1	9	13	22
c	Will it help in accessing to professional resources and capabilities	4	5	8	15	18
d	Will help in gaining advanced technology and management experience	5	1	9	12	23
e	Will outsourcing help in having a better organizational form	4	5	8	15	18
Sub Total 5		8%	6%	16%	26%	46%
6 Outsourcing Risk						
a	Will outsourcing help in decreasing and sharing risks	5	1	9	10	25
b	Will outsourcing lead to losing control	5	1	9	22	13
c	Will there be more legal disputes with outsourcing	5	1	9	11	24
d	Will outsourcing lead to less innovation	5	1	9	23	12
e	Dependence on outsourcees will compromise secrets of the company	2	4	4	10	30
Sub Total 6		9%	3%	10%	30%	48%
Grand Total		7%	8%	15%	30%	45%

Table 6: Questionnaire responses

(Note: 5 Point Lickert Scale x 5 Questions x 50 respondents)

Cost reduction has proved to be one of the major factors towards the opting of the outsourcing model. 45% of the respondents strongly agree to outsourcing of the infrastructure which leads to cost reduction. Add another 26% respondents who agree to the cost reduction mechanism thus 71% of the respondents are of the opinion that by outsourcing, the costs will be reduced. 7% of the respondents have shown their disagreement (Fig 24).

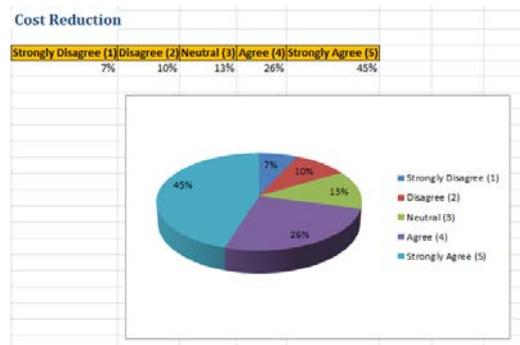


Figure 24: Cost Reduction analysis

As far as the organizational performance is concerned, 42% strongly agree to the impact of improved performance with 13% showing their Neutrality (Neither Agree Nor Disagree). The disagreement figures will add up to 16% out of which 7% strongly disagree while 9% disagree (Fig 25).

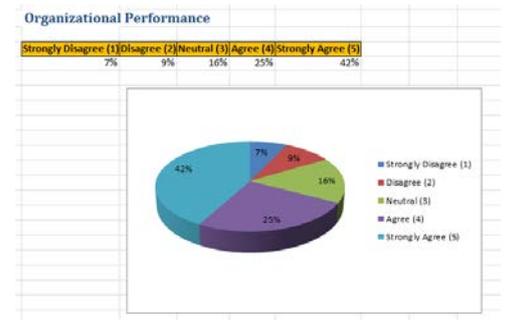


Figure 25: Organizational Performance analysis

In case of employee performance 37% agree to increase employee productivity index while 20% remained neutral. Disagreement reached to cumulative 18% (Fig 26).

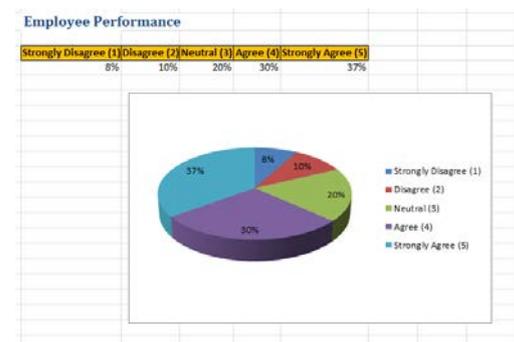


Figure 26: Employee Performance analysis

Flexibility of working has shown a similar trend however the disagreement on that count has reduced to only 5%. Similarly neutrality has shown reduction to 15% (Fig 27)

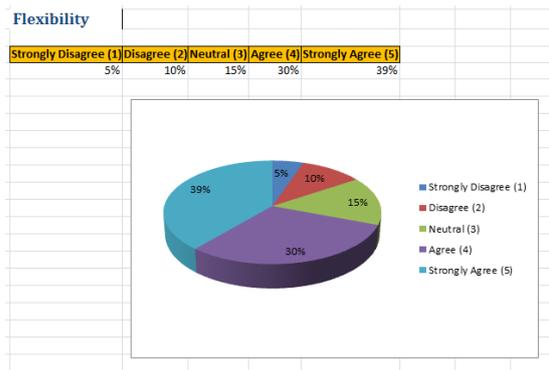


Figure 27: Flexibility Analysis

Access to Specialized Skills & Technology has emerged as an important component with 44% strongly agreeing to it while 26% have shown their agreement. This will add up to 70% (Fig 28)

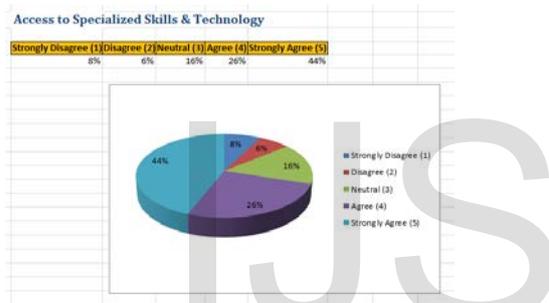


Figure 28: Access to Specialized Skills & Technology analysis

Outsourcing risk are more evident here as majority of the respondents consider this a major threat to the company which needs mitigation and a strong analysis before entering into these outsourcing agreements (Fig 29).

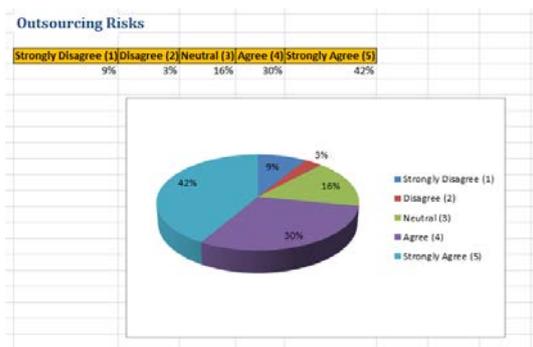


Figure 29: Outsourcing Risks analysis

And finally the overall picture shows (Fig 30) that 7% strongly disagree, 8% disagree to the outsourcing. 16% of the respondents are undecided while 28% agree with 41% strongly agreeing to the outsourcing benefits.

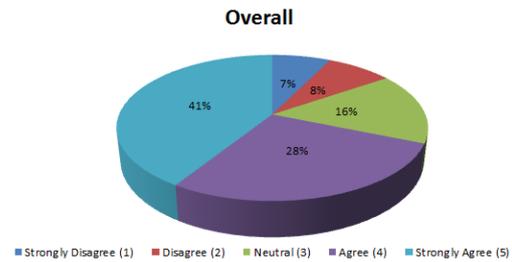


Figure 30: Overall analysis of outsourcing

5. CONCLUSION & MODEL

5.1 Conclusion

Based on the data analysis, following are the outcomes:

- Majority of the respondents feel that the net effect of outsourcing will lead to the reduced costs in terms of the infrastructure, software and services. When companies tend to do everything on their own, they will have to invest heavily in the infrastructure or software costs. On top of that the human capital requirements further add to the financial costs. Instead of making all these investments, it is much more viable to outsource small components of the setup to the vendor. The financial agreements reached between the vendors and the operator should be based on the scales of economy. This will result in subsequent

reduction in capital and operational costs. In the competitive environment of the Telecom Sector, every penny counts. Saving one bit here and there will have a significant impact on the overall financial health of the organization.

- Improved organizational performance can only be achieved through the fragmentation of the setup into smaller chunks of units and then further outsourcing them to the qualified and competent vendors. Once done, the main management control will still rest with the operators however the macro and micro level manageability will increase. This will have a direct impact on the organizational performance. Organizational performance in today's world of telecom industry is also much more dependent on the information technology tools which further help to run the organization in an effective manner. Outsourced infrastructure management becomes much easier with the deployment of various software tools which with few clicks can bring to screen the profitability or otherwise of the organization on real time basis.
- Although there is a fear among the employees of losing their jobs, however most of the managers involved in the outsourcing feel that their overall performance has increased. Instead of doing everything

with their own hands or supervising all the tiny bits, now they can manage the things at macro levels. This provides the time to the managers to focus on the more pressing issues of the organization instead of spending too much time on everyday operational complexities. The overall effect of this is the enhancement of employee performance. The undecided segment of the sample most likely is concerned about the fears of change which is natural. The adaptation to new trends or setup requires a mind change which does not happen overnight. It is a developmental phase/process which needs time for its nourishment.

- Flexible infrastructures are based on the concept of expanding and reducing based on the market trends. In the telecom market, the fast pace of changing market dynamics need immediate flexibility. Through the diversification of the business potential, this flexibility can be easily achieved. If any outsourced unit is not showing positive results that can be closed or re-sourced thus not affecting the entire business of the company. This is a very solid parameter which inherently blends in itself the concept of multiple layers of flexible redundancy.
- Telecom Sector is the only sector which is going through rapid transformation with every passing day. From a complete analogue world

to the digital world of virtual reality, the innovation in terms of networks, services, bundled packages, marketing tools, sales initiatives etc., is enormous. It is also to be noted that it is almost impossible for a single organization to have all the relevant technological tools plus skills in-house. Developing all the skills in-house is a herculean task. The best way to approach this is through the outsourcing of facilities and in the process getting rapid access to the skilled force. The time consuming process of in-house development is replaced by a second layer of skilled force armored with new technology. This finally leads to the establishment of a technological and skills infested organization consisting of unlimited pools of qualified and competent professionals.

- The element of Risk is a crucial factor for any organization to embrace. However the cost of not taking risk is even bigger for those results in ultimate stagnation and final strangulation by the market forces. A calculated and balanced approach is required for the risks mitigation. The risk areas can be further sub-divided into smaller fragments thus dividing the risk factor. If in this chain of segments, any segment breaks down, the operator will still have the option to look for alternate solutions. In today's technological world, the elements of secrecy etc can also be easily controlled. With the

advancement of the computer forensic applications, it has almost become impossible not to catch the infiltrators. Hence the outsourcing risks can be eliminated through strict access controls.

5.2 Model

Based on the extensive research analysis, a model is proposed which if adopted can easily take care of outsourcing concerns, thus avoiding failures in the organization.



Figure 31: Outsourcing Model

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