Benefits of Outsourcing Information and Communication Technology Infrastructure

Muhammad Ans Ilyas
muhammadansilyas111@gmail.com

Abstract

We have seen for the last few decades that Telecommunications Industry has shown a lot of progress relating to infrastructure development associated with access to telecommunications services, thus leading to reduction in customer services charges. Profit margins have seen reductions that lead operators to consider alternatives by adopting new models while keeping service quality unchanged.

By deploying a network model, costs, risks, customer engagement profitability, new technological embracing and business costs can be substantially reduced. The research involves the analysis of the variables including, reduction in cost, performance of the organizations, performance of the employees, flexibility, risks of outsourcing and access to specialized skills & technologies.

It was seen that improved organizational performance can be achieved by dividing the infrastructure to be outsourced into smaller units and then further outsourcing them to the competent vendors. Most employers felt that the outsourcing infrastructure has led to the increase in their performance and productivity.

Introduction

Network infrastructures, services being offered, and the telecom market is looked upon in this chapter. This will in turn define the telecom scene and the future roadmap for the introduction of new ideas.

Different Types of Networks

Basically all the networks are characterized into the following two broader network type domains.

(a) Land Line Networks
(b) Wireless Networks

All the networks having the cable layout are called landline networks. The cable can be coaxial or optical fiber depending on the deployments. Wireless networks are generally based on Digital Radios, Cellular Communications and Free Space Optics. hence, networks that include cables are called land line networks and are used for data / voice transmission. In case of wireless networks, there are no cables and the transmission is done through air interfaces. Recent developments into networks have added the Next Generation Networks which need lower resources, lower costs and have better set-up compared to the legacy networks.

Different network architectures are shown below.
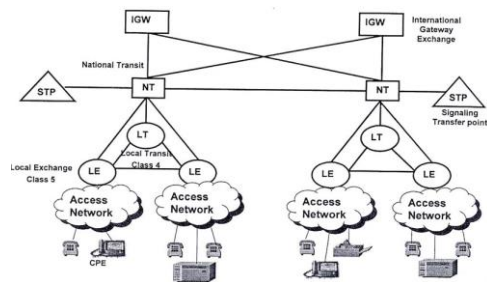
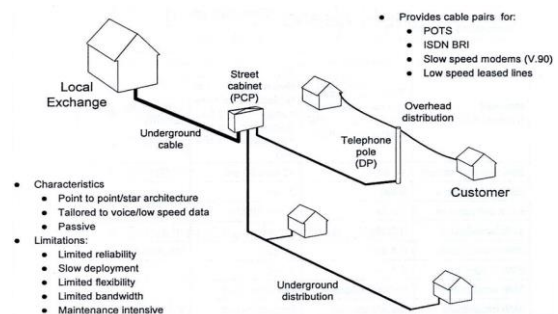- ***Plain Old Telephone Service (POTS)***

Fig 1: POTS-PSTN Network

Fig 2: Access Network: Users Premises to the Exchange
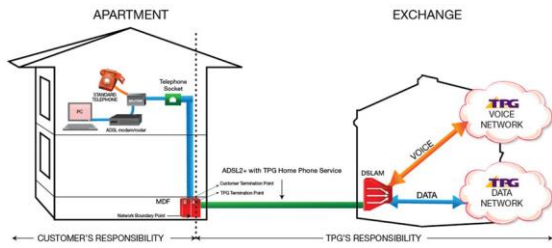
- *Digital Subscriber Line (DSL)*

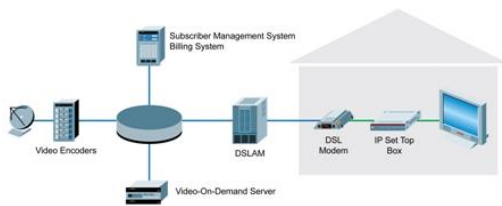Fig 3: Digital Subscriber Line Typical Network Design

- **IP TV**

Fig 4: Internet Protocol (IP) Television(TV) – IP TV Network
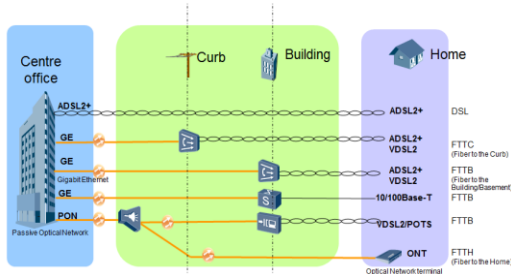
- *Optical Fiber Access Network (OFAN)*

Fig 5: Optical Fiber Access Network
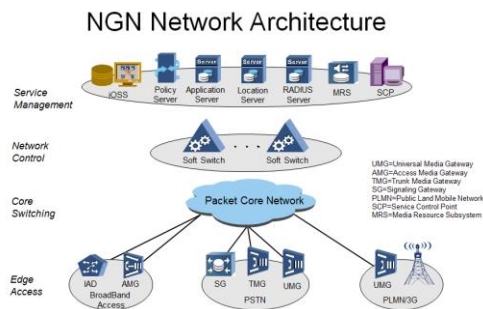
- *NGN*

Fig 6: NGN Design

Emergence of Next Generation Networks has changed the communication infrastructures substantially. Cost reductions, improved service quality and effective network management are achieved through this network design.

- *Cellular Communication*

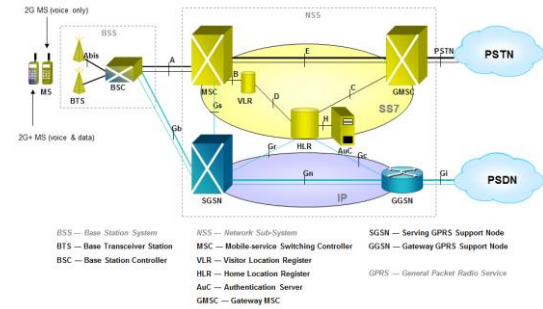Now we will look at the wireless networks having the following infrastructures:

Fig 7: Cellular Communication

Telecommunication Market Scene

Telecom landscape in the country is summarized below.

Fig 8: Telecom Landscape of Pakistan

The current and the latest statistical data is shown below to have an understanding of the telecom landscape in the country. The tele density is 82.2% as of October 2020.
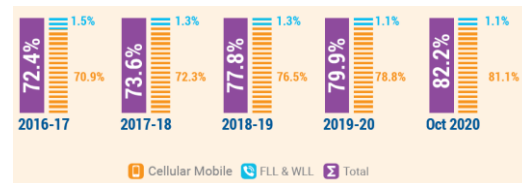

Fig 9: Teledensity

Total number of subscribers for cellular, FLL and WLL are shown below from 2016 to 2020 as per PTA statistics.
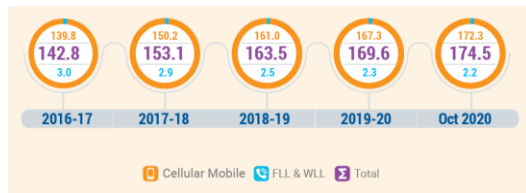

Fig 10: Subscribers (Cellular, FLL and WLL)

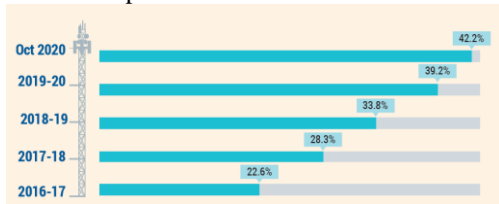Broadband penetration has reached 42.2%.

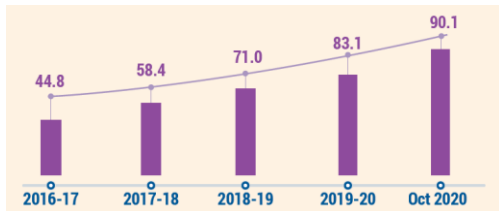

Fig 11: Broadband Penetration

Fig 12: Broadband Subscribers (in million)

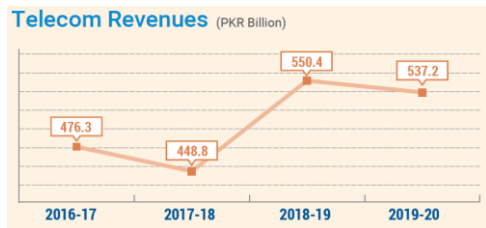The telecom revenue has touched 537.2 billion.

Fig 13: Telecom Revenue

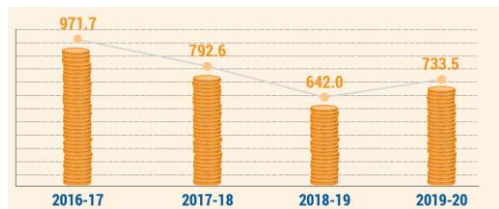Total telecom investment in US Million Dollars is shown below.

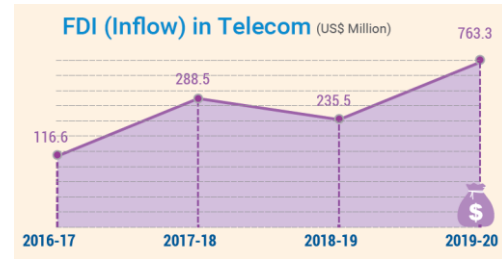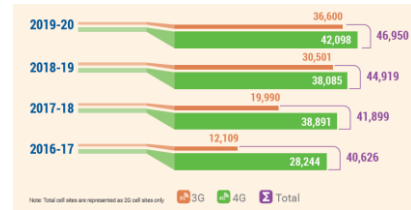Fig 14: Total Telecom Investment (US$ Million)

Fig 15: FDI Inflow

Fig 16: Cellular Mobile Cell Sites
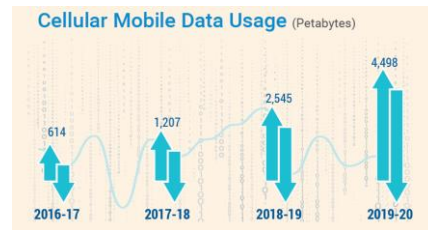
Fig 17: Cellular Mobile Data Usage
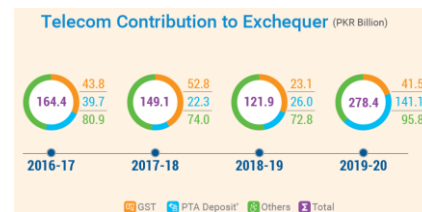
Fig 18: Telecom Contribution to Exchequer

Top Five Asia-Pacific Regulators (2019)		
	Score	GEN
SINGAPORE	130.5	G5
JAPAN	109.5	G5
AUSTRALIA	94.5	G4
PAKISTAN	88.0	G4
MALAYSIA	87.0	G4

Source: ITU 2019

Fig 19: Top Five Asia-Pacific Regulators

The above statistics are an ample proof of the dynamic increasing telecom market in the country but there are many barriers which need to be removed for future growth.

Research Motivation and Challenges

When you look at many growth barriers, it is very important to focus on this field. As a result of these major developments, the result has been a reduction in tariffs and thus reduced profit margins because of competition. The

purpose of this research study is based on the challenge of looking at opportunities that will lead to the use of resources as well as the sustainability of these over time. It is a major challenge that needs to be addressed in some areas where many countries have seen major players disappear because they failed to see volatility and remained stagnant in the market.

Currently the use of Telecom infrastructure is a critical area for the allocation of resources which is a major challenge for communication networks. There are many challenges that need to be addressed in the implementation and adoption of service delivery models as these are constantly evolving the dynamics.

Premise of Research

Research problem, aims, objectives and the requisite methodology of the research work were studied in this research.

Research Problem

The research was focused on the Pakistani Telecom Market where most international operators and vendors have made significant investments for providing telecom services and also participating in many projects in collaboration with local and international multicultural teams. No focused research has ever been conducted to avoid failures and as to how one can mitigate them.

Aims and Objectives

Following were the aims of this research contribution:

1) Effect of outsourcing on employee's performance.
2) Effect of outsourcing on Organization Performance.
3) Conceiving a Model

Following variables were analyzed in this research.

(a) Reducing Costs
(b) Outsourcing Risks
(c) Employee Performance
(d) Organizational Performance
(e) Availability-Access to specialized skills & technologies
(f) Flexibility

Research Methodology

The list of questions was distributed within the Management of Telecom Sector. Likert scale was used to analyze the responses.

Review of Literature

Outsourcing is a new dimension in the provision of telecom services in the market. In order to reduce the operational costs, it is a must to find solutions which can enable cost reductions in a competitive market environment. In addition to this all this has to be aligned with the business interests leading to profitability. Outsourcing is generally defined as the process of purchasing goods and services from an external service provider rather than producing the same goods or providing similar services on its own (TI, 2005) [1].
The introduction of the first information systems (IS) took place in the sixties (Dibbern et al., 2004) [2] Funding increased in the 1980s and 1990s (Kakabadse and Kakabadse, 2002) Billon's $ 1 agreement with the International Business Machine (IBM) for the construction of a database that would eventually take over Kodak and Digital Equipment Corporation (DEC) operations (Loh and Venkatraman, 1992) in companies.

Since then, a lot of money has been spent on building sales models for IT companies to change this focus. One of the major causes of disbursements is to generate profits by reducing operating costs (Juntiwasarakij, 2008) [5]. The U.S. market for all types of spending grew by 20% between 1999 and 2000 (Casale, 2000) [6].

Service delivery is a myriad of position decisions. The key is to decide which sets of skills should be developed between partners and which ones should be developed in-house. This decision has a significant impact on maintaining the relationship between the seller and the client (Beaumont and Sohal, 2004) [7]and (Beaumount and Sohal, 2004) [8].

World over companies embrace job creation as an alternative to accessing the resources needed to successfully carry out IT / IS operations (Waheed and Molla, 2004) [9]. Pakistan's IT / IS industry was established in 1977, when a private businessman developed software firm by Software Limited in Lahore. Because of this, people involved in IT have to work hard [10].

Conceived Framework of the Research

The following six frameworks have been reviewed.

(a) Reducing Costs
(b) Outsourcing Risks
(c) Employee Performance
(d) Organizational - Performance
(e) Availability-Access to specialized skills and technologies
(f) Flexibility

- ***Reducing Costs***

As pointed in the research, Beaumont &Sohal, 2004 / Behara, 1995, cost of uncertainty can be taken care by reducing costs and implementing effectiveness [11]. Cost reduction is thus an important factor.

- ***Organization Performance***

As researched by Juntiwasarakij (2008) [12], work and dedication of employees is reflected in the performance of organizations. Organizational performance is key to the business success.

- ***Flexibility***

Expansion / reduction (whichever works) depending on the specific needs. The flexible approach has many hidden benefits that become apparent over time.

- ***Availability-Access to Specialized Skills & Technology***

Having access to the latest technology and having the human resource having the requisite skills is key to the progress. This gives a head start for futuristic development based on innovation.

- ***Outsourcing Risks***

Lesser the risks of outsourcing, the greater will be the chances of profitability. Hence outsourcing of the infrastructures by first mitigating any risks is extremely important.

Data Analysis

- ***Questionnaire***

Questionnaire was developed and distributed among various selected telecom organizations. Five-Point Likert scale was used to carry out the analysis.

Standard followed is shown below:

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

Tab 1: Likert Scale

The distributed questionnaire for the analysis are shown below:

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 repute 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 Outsourcing Outsourcing Risks
Will outsourcing help in decreasing and sharing Outsourcing Outsourcing 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

Tab 2: Questionnaires

- ***Samples***

No of Questionnaire's = Fifty
Invalid = None
Following are selected companies:

Telecom Industry	Frequency
Mobile Operators	
Mobilink	10
UFone	10
Telenor	5
Network Providers	
PTCL	15
Worldcall	10
Total	**50**

Tab 3: Sampled Telecom Companies

Analysis

Following is the detailed analysis.

Tab 4: Responses Analysis

Reducing the costs has proven to be one of the most important attribute or variable in choosing employment model. Forty-Five Percent of respondents strongly agree with the outsourcing of infrastructure leading to cost reduction. Include another Twenty-Six percent of respondents who agree with the cost reduction method and therefore Seventy-One percent of respondents are of the opinion that with the dismissal of employees, costs will be reduced. Seven Percent of respondents indicated their disagreement.
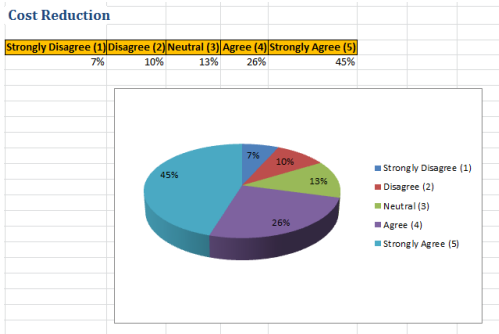

Fig 20: Analysis of Cost Reduction

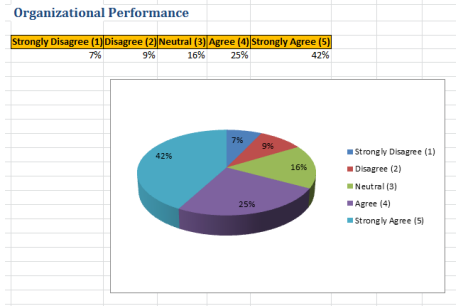Subsequent analysis is shown below which can be ascertained from the pie charts.
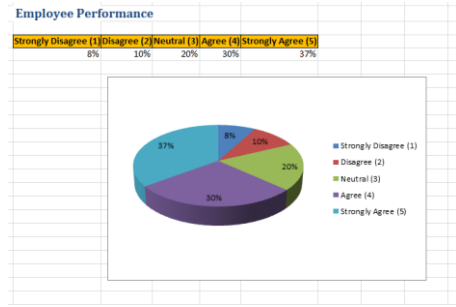

Fig 21: Organizational Performance
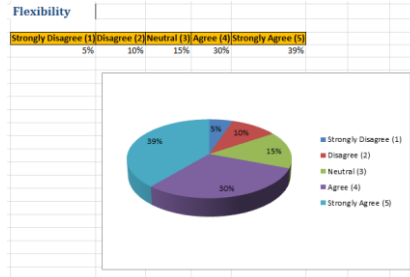

Fig 22: Employee Performance
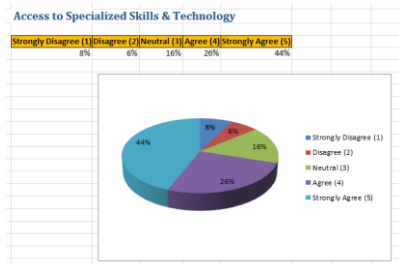

Fig 23: Flexibility Analysis

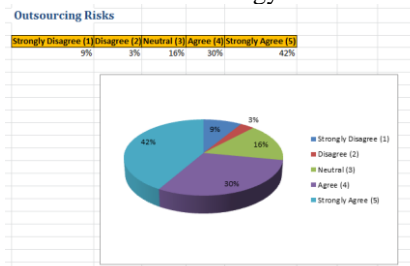Fig 24: Access to Specialized Skills & Technology
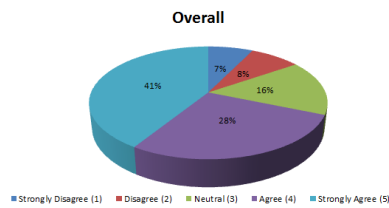

Fig 25: Outsourcing Risks

Fig 26: Cumulative Assessment of outsourcing

Conclusion & Conceived Model

- **Research Work Conclusions**

  o According to the data analysis, the following results:

  o Outsourcing will lead to the reduction in the costs. Infrastructure costs are reduced so are the software and services costs which show remarkable reduction.

  o The agreements reached between the outsourced vendor and the outsourcing company should be competitive and are based on win-win solutions for both the parties.

  o In the cut throat competition, these small savings bring in much reward considering cut-throat completion in the markets.

  o Organizational performance can be enhanced if the works are divided into smaller segments and then handled effectively.

  o Organization's operations in today's world of telecommunications also rely heavily on information technology tools that also help to run the organization more effectively.

  o By using the software's in the used infrastructure reduces the costs substantially in terms of effective utilizations.

  o Mindset change is must if we have to transform the infrastructure based on profit abilities. The business acumen is required for outsourcing transformations.

  o Outsourcing has to be in line with the market dynamics which are evolving with every passing day.

  o Mitigating risks is of utmost importance.

- **Conceived Model**

Based on the questionnaire results, the below innovative model is presented.

Fig 27: Conceived Model for Outsourcing

References

[1] Texas Instruments Inc (T.I, 2005), http://www.ti.com/

[2] EDS (Dibbern et al., 2004),
https://books.google.com.pk/books?id=EpUOLzzBGbAC&pg=PA246&lpg=PA246&dq=EDS+%28Dibbern+et+al.,+2004%29&source=bl&ots=7KrrpS34lQ&sig=iEQXSvvziOr4sYQQfr9szMQnMEY&hl=en&sa=X&ei=QAsJVetDxNtTtqqCmAw&ved=0CBwQ6AEwAA#v=onepage&q=EDS%20(Dibbern%20et%20al.%2C%202004)&f=false

[3] Kakabadse and Kakabadse, 2002, Outsourcing of services? By: Johan Falk January 2003.
http://www.johanfalk.com/documents/OutsourcingOfServices.pdf

[4] Loh and Venkatraman, 1992. Vol. 9. No, 1, pp. 7-24

[5] Juntiwasarakij, 2008. Proceeding,
SIGMIS CPR '08 Proceedings of the 2008 ACM SIGMIS CPR conference on Computer personnel doctoral consortium and research
Pages 164-167
ACM New York, NY, USA ©2008

[6] Casale, 2000

[7] Beaumont and Sohal, 2004,
http://www.emeraldinsight.com/doi/abs/10.1108/01443570410541993

[8] Beaumount and Sohal, 2004,
http://www.emeraldinsight.com/doi/abs/10.1108/01443570410541993

[9] Waheed and Molla, 2004, Paper no.69 An Investigation of the Impact of Client Vendor Partnership Quality on IS Outsourcing Success: the Case of Oman.

[10] Software Limited in Lahore. Jahanara (2005), http://www.systemsltd.com/

[11] Beaumont and Sohal, 2004; Behara, 1995,
http://www.buseco.monash.edu.au/mgt/research/working-papers/2005/wp22-05.pdf

[12] Juntiwasarakij (2008), http://dl.acm.org/citation.cfm?id=1355279