

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

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ABSTRACT

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

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

Keywords: System Integrators, Tower Management, Outsourcing, Framework

1. INTRODUCTION

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

Mobile tower outsourcing offers significant potential for cost savings for both incumbents and new entrants. At the same time, outsourcing is accompanied by risks such as reduction in strategic control and potential for information leaks. Regulators face the challenge of

ensuring a level playing ground for all operators with no threat of cartels. Our analysis presents specific approaches to tower outsourcing for incumbents and new entrants and challenges faced by system integrators.

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

2. LITERATURE REVIEW

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

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

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

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

Cronk and Sharp (1995) talk about the theoretical development of outsourcing of IS functions which is a critical and pervasive contemporary phenomenon. Firm’s outsourcing strategy can be determined by synthesizing four theoretical models namely resource-based, resource-dependent, transaction cost and agency theory model. Jurison (2005) views IT outsourcing as a classical make-or-buy decisions consisting of examining an acceptable balance between risks and benefits. The principal development model discussed in this paper is the relationship between outsourcing risks and benefits. This model can assist management decision in determining; outsourcing or in-sourcing choice for a particular function as well as comparing and evaluating competing vendor proposals. Lacity, Willcocks and Feeny (1996) presented an analysis on the failure points of the IT outsourcing

to produce the expected cost savings or non-financial benefits. The paper outcome is selective outsourcing frameworks to clarify sourcing options and aid managers in deciding which IT functions to contract out and which to retain in-house. Thus, selective sourcing meets customer’s needs while minimizing the risks associated with total outsourcing approaches.

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

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

3. TOWER MANAGEMENT INDUSTRY

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

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

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

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

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

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

At present telecom operators in India have around 410,000 towers in use as shown in Table 1 and estimated projected

growth of 100,000 towers during the next 3 years. This projection may come down due to consolidation of telecom operators.

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

3.1. Working Model in Tower Management

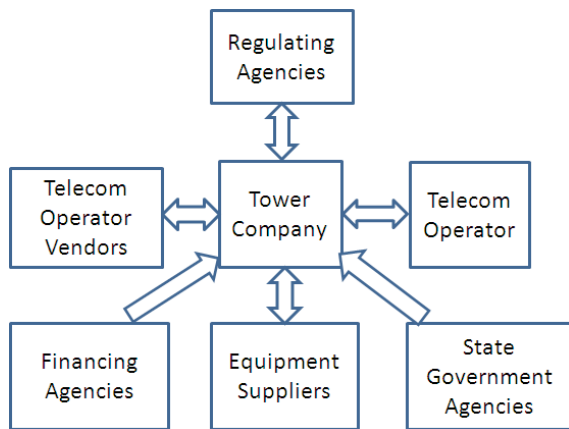
The extraordinary growth in mobile subscriber's base in India over the last few years has created huge opportunities for the telecom infrastructure industry. The tower industry is also growing continuously with the active support of the Government. During the early years, the mobile operators used to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

Table 2: Various Models Tower Sharing and Outsourcing

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

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

Figure 1: Multivendor Working Model for Tower Companies



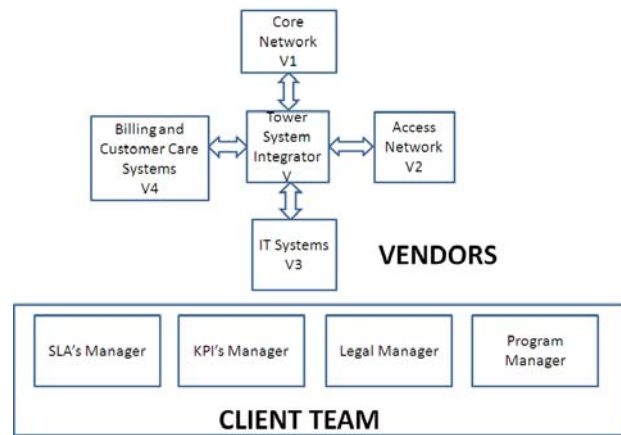
The working model for telecom tower companies is where the Tower Companies deal with all the suppliers and partners related to tower construction to O&M; whereas; the telco's can concentrate on their core business. The risk, finance, suppliers/ partner management, working with government agencies is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

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

4. MULTISOURCING IN TELECOM

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

Figure 2: Multisourcing in Telecom



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

4.1. Critical Metrics for System Integrator

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

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

4.1.1. Contract Formulation

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

Figure 3: Impact Contract Formulation

| | | | |
|----------------------|-----------|--|---|
| Contract Formulation | Excellent | End to end deliverables clearly defined for every vendor | Excellent collaboration, cooperation, and accountability driven by contract |
| | Poor | Vendors are not clear about end to end deliverables | Every vendor working in silo and serious lack of collaboration |
| | | Low | High |

System Integrator Performance

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

4.1.2. Strategic Partnership

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

add value by ensuring their efforts are in sync with the strategy.

Figure 4: Impact of Vendor as a Strategic Partner

| | | | |
|-----------------------|-----|--|--|
| Strategic Partnership | Yes | Individual vendor deliverables not clearly defined, internal competition | Vendors are strategic partners (Risk and Revenue sharing) |
| | No | Competition among vendors, lack of trust, no collaboration | Every vendor working in silo and serious lack of collaboration |
| | | Low | High |

System Integrator Performance

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

4.1.3. End to End Delivery

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

4.1.4. Collaborative Innovations

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

Figure 5: Collaborative Innovations

| | | | |
|---------------------------|-----|--|--|
| Collaborative Innovations | Yes | Operational or technological Innovations helping overall business in general | Innovations in which SI teams are actively engaged |
| | No | Contracts are SLA's driven for each vendor | Local innovations in the respective area of a vendor and serious lack of collaboration |
| | | Low | High |

System Integrator Performance

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

4.1.5. Cooperation and Competition

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

5. PROPOSED FRAMEWORK

It is obvious that critical set of metrics as discussed in previous sections of the paper have profound impact either positively or adversely on the overall performance of a systems integrator. In a multi-vendor situation every vendor in a way is a system integrator as there could be customer-supplier relationship among most of the processes or functions which have been outsourced. These

dependencies if addressed correctly from the initial stage of contract formulation could be turned into an advantage as vendors will bring different skills and competencies to the table in their respective domains along with the best practices. It is really up to the management team of the client to harness this together for getting maximum ROI from outsourced projects.

Figure 6: Impact of Critical Metrics on Vendor Performance

| | | | |
|--|---------------|--|---|
| Contract Formulation Collaborative Innovations Strategic Partnership | Excellent/Yes | Serious issues with skills, competencies, domain expertise, and delivery model | Vendors are strategic partners (Risk and Revenue sharing) |
| | Poor/No | Deliverables not clearly defined for end to end delivery | Every vendor working in silo |
| | | Low | High |

System Integrator Performance

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

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

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

6. CONCLUSIONS

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

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

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

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

REFERENCES

- Jennings, D. (1997). Strategic guidelines for outsourcing decisions. *Strategic Change*, 6(2), 85-96.
- Mclvor, M. (2000). Strategic outsourcing: Lessons from a system integrator. *Business Strategy Review*, 11(3), 41-50.
- Fjermestad, J., & Saitta, J. (2005). A strategic management framework for IT Outsourcing: A review of the literature and the development of a success factor model. *JITCAR*, 7(3), 42-60.
- Aron, R., & Singh, J. V. (2005). Getting Off shoring Right. *Harvard Business Review*.
- Kumar, S., Aquino, E. C., & Anderson, E. (2007) Application of a process methodology and a strategic decision model for business process outsourcing. *Information Systems Knowledge Management*, 6(4), 323-342.
- Brege, S., Brehmer, P. O., & Lindskog, H. (2010). Sourcing, insourcing and two times outsourcing. *Strategic Outsourcing: An International Journal*, 3(2), 144-162. Emerald.
- Lacity, M. C., & Willcocks, L. P. (1998). An empirical investigation of information technology sourcing practices: Lessons from experience. *MIS Quarterly*, 22(3), 363-408.
- Tinselboer, K. (2005). *The Present and Future of Outsourcing: Theory Meets Practice*, Research Paper, University of Twente.
- Kirkegaard, J. F. (2005). *Offshore Outsourcing: Much ado about what?*, CESifo Forum, Ifo Institute for economic research at the University of Munich, 5(2), 22-29.
- Zhu, Z., Hsu, K., & Lillie, J. (2001). Outsourcing - A strategic move: the process and the ingredients for success, Research Paper. *Management Decision*, 39(5).
- Currie, W. L., & Willcocks, L. P. (1998). Analyzing four types of IT Outsourcing decisions in the context of scale, client/supplier interdependency and risk mitigation. *Journal of information Systems*, 8(2), 119-143.
- Hillman (2008). Outsourcing network operations' Centers. *A Managed Service Report*.
- Weeks, M., & Feeny, D. F. (2008). Outsourcing: From cost management to innovation and business value, *California Review Management*
- Gonzalez, R., Gasco, J., and Llopis, J. (2009). Information Systems Outsourcing: A Literature Analysis, Science Direct
- Bahli, B., & Rivard, S. (2003). The information technology outsourcing risk: A transaction cost and agency theory-based perspective. *Journal of Information Technology*, 18, 211-221.
- Cheon, M. J., Grover, V., & Teng, J. T. C. (1995). Theoretical perspectives on the outsourcing of information systems. *Journal of Information Technology*, 10(4), 209-219.
- Cronk, J., & Sharp, J. (1995). A framework for deciding what to outsource in Information Technology. *Journal of Information Technology*, 10(4), 259-268.

- Domberger, S., Fernandez, P., & Fiebig, D. G. (2000). Modeling the price performance and contract characteristics of IT outsourcing. *Journal of Information Technology*, 15, 107-118.
- Jurison, J. (2005). The role of risk and returns in information technology outsourcing decisions. *Journal of Information Technology*.
- Lacity, M. C., Willcocks, L. P., & Feeny, D. F. (1996). The value of selective IT sourcing, *MIT Sloan Management Review*.
- Lee, J. N., Miranda, S. M., & Kim, Y. M. (2004). IT Outsourcing Strategies: Universalistic, Contingency and Configurational Explanations of Success. *Information Systems Research*, 15(2), 110-131.
- Deringer (2010). A Network shared. Economist Intelligence Unit
- Idachaba, F. (2010). Telecommunication cost reduction in Nigeria through infrastructure sharing between operators. *The Pacific Journal of Science and Technology*, 11(1), 272-276.
- Wyman, O. (2008). *Delivering on the Promise of Telecom Network Sharing*, MMC
- Jaruzelski, B., Katz, R., & Ribeiro, F. (2004). *Outsourcing Trends in The North American Telecommunications Market*, Booz & Company
- Hasbani, G., Darwiche, B., Mourad, M., & Chanab, L.A. (2007). *Telecom Infrastructure Sharing Regulatory Enablers And Economic Benefits*, Booz & Company

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