ABSTRACT

Today’s computer networks are changing the way enterprises do business across the globe and also impact the way we all work and live. While there has been an ever growing demand for faster and quicker communications by Business and individuals, the need for faster and quicker communication has been more required by enterprise business teams and their end customers, who need these data to enable them to make instantaneous, critical and correct business decisions.

On one side, there is a growing demand for faster, better communication that has been felt more and more with global companies off shoring their back office and other support related work across the globe. On the other side, there is also a need from the enterprise business team and their customers to look at new and upcoming technologies and tools which can be better and effectively leveraged.

Developing countries and their telecom service providers have been competing against each other in providing better and current infrastructure, latest available technologies and newer products, which help enterprises and their customers to stay, connected. There is Technological advances being made in existing infrastructure by equipment manufacturers which have enabled telecom companies to provide better infrastructure either by replacing existing infrastructure or by upgrading the hardware / capacities. These technological advances has given arise to newer services and products which have evolved (evolving) over the same period.

On similar lines, there has been an increase and constant growth on the Service Oriented Architecture which has brought a variety of focus and debate on the various areas this can be put into use in the newer domain areas and technology. As one of the major domain areas in which companies are in competing with one another other is Information Technology. There are companies which have taken serious commitment in building their products and architecture based on this framework and thereby competing with each other in expanding their growth and technology. There’s a strong likelihood that in the future that more manufacturing
companies foray into this service oriented area and focus on claiming their proprietary architecture and framework.

While Industry Experts agree that strength in SOA would help in better efficiency and improvement in technology. The principles of SOA are currently being applied to the field of network management as well. Examples are TS 188 001 NGN Management OSS architecture from ETSI.

SOA, or services-oriented architecture, in the recent past has been the area which has become very much promising to deliver unprecedented flexibility and cost savings to Information Technology. It is also being used to define a methodology for the use and re-use of software components and business processes.. These are currently applied in the areas like intra / inter-enterprise services reuse and process interoperability.

There have been other advancement and progress happening in this area. Listed below are few of the examples:

- Major vendors have been claiming to have adopted SOA and have published their own views and reference architecture for SOA.

- Upcoming SOA start-ups are being acquired by larger vendors, creating further volatility in the market.

- Enterprise IT teams fail to communicate effectively to the business on how money spent on SOA will automate business functions and deliver solutions cheaper, better, and faster.

- There has been multiple special interest groups attempting to define SOA, adding to the confusion and slowing adoption of SOA overall.

- Development of management tools is not sufficient and many are not available off the shelf.
SOA is either going to be the proposed magic cure-all for legacy IT woes, or it is going to be one of the latest empty promise from an industry with a rich legacy of hype and jargons.

From an industry expert’s view, SOA is nothing but an architectural approach that’s essential for Senior IT Management and its supplier’s ability to create dynamic IT, and support dynamic enterprises. It would also be appropriate to state, that sometimes dynamism does not provide the much needed results in the real world of IT or depends more on its end results.

The success of SOA, in its current (and most promising) incarnation, depends on:

- The development and implementation of a robust set of processes and industry-specific "services" standards
- Implementation of those standards in a wide range of commercial, service-oriented offerings from IT suppliers or vendors,
- Business service offerings available readily thru Service providers
- Widespread adoption of those products and services by enterprises - which will require, in many cases, new skills within the IT organization

The first two steps will be a work-in-progress for the next several years at least, with widespread adoption by customers spanning to the next decade as well.

While large enterprises clearly understand the importance of architecture for their large and complex environments - and are the natural first-wave adopters - the majority still will only adopt SOA broadly when the modular structure and standards that embody SOA are "baked in" to a wide variety of off-the-shelf products and services. Given the acute business pressures most Senior IT Managements personnel are under, large-scale adoption will be based on credible, well-documented SOA-based benefits of those products (faster speed to deploy, lower costs to maintain, greater ability to link IT to business, etc.), rather than on architectural principles and faith.
There have also been other Service Oriented models like the Service Oriented Network Architecture (SONA), Service Oriented Infrastructure (SOI) and Service Oriented Security (SOS) and many other models which have come up to the fore over the last couple of years. In the case of SONA, this would be ideally useful for the Senior IT Management to understand and focus not only on "making the network more intelligent"; but it is all about delivering end-to-end functionality across all the major IT assets to support critical business processes.

Communication Technology is an advancing area of computer science with increasing relevance to real life business applications such as enterprise business infrastructure, banking networks and other business critical applications. The term communication technology means providing communication infrastructure, network and information systems. It also stresses upon the current needs of an enterprise in integration of its telecommunications systems into a unified communication system. To assess the communication network needs of an organization effectively and to evaluate and choose various communication technologies and service products and policies, the enterprise communication network manager (for global enterprises) needs to understand the various existing technology platforms and the various services offered by Telecom Service Providers.

In this dissertation, we plan to review and analyze these Service Oriented models and then understand as to how this architecture is and would be relevant to improving the overall services from an IT Services perspective. The main interest is to understand the correct service oriented framework which basically calls for a network that links all the resources within an enterprise and will include a set of services that would work across the linked resources. This could be eventually offered as “Service Oriented” services by enterprises or telecom service providers to their end customers. This should help the enterprise; better take advantage of existing network capacities, hardware devices, servers, and other IT resources.

We would also be analyzing how the Global Agile Infrastructure Communication Network (GAICN) architecture used for building enterprise communication networks could be provided as Services as opposed to building
independent multiple disparate networks which typically is the current state in many enterprises. Eventually this Global Agile Infrastructure Communication Network could allow telecom service provider’s to market and deliver a new value added enterprise networking services across technology and platforms to their enterprise customers.

The above has motivated me to study and analyze the existing communication network technologies and Service Oriented models. The understanding of these technology and service models would help in proposing a Global Agile Infrastructure Communication framework which could help enterprises and also enhance the existing services provided by telecom service providers.

Contributions in this dissertation involve the following areas and with focus on seeing how these could be provided as a service oriented approach to end customers, whether internal or external:

- Understand the various existing Service Oriented models available
- Define the existing business problems faced by enterprises and their customers.
- Propose appropriate design framework for the business problem
- Validate and test the effectiveness by implementation
- Study and analyze the program implementation timelines
- Analyze the cost impact to overall business / service model.

With ever growing IT and ITES Service industry market across the globe, there is a growing need for a Global communication framework. Apart from this framework being used by enterprises for their internal needs it could also be offered as services to their current and future customers. Since most of the communication networks around the globe are provided by telecom service providers they could also benefit by leveraging the Global communication framework.
As part of this dissertation we would do problem definition, solution design and development of the global model, validate the solution design in multiple scenarios. During the course of validation, analysis would be done on how the global model was deployed using various communication network models in different enterprise.