

PREFACE

The Service Oriented Architecture had been adopted by many companies and industries because the industry started believing that SOA could help in removing some of the existing issues and mess created in the IT. In order to achieve a business process, we have seen that there are tight integrations between these applications/software components are done which makes it extremely inflexible to bring in any change into the system. The adaptability and the agility are extremely important for today's enterprises because of various changes like mergers and acquisitions, government policy changes, etc. The business expects the IT to be more agile towards this changes which will help to be more competitive in the market place. We also realize and based on our literature that in order to survive, compete and win, enterprises must adapt and there is no compromise in that.

We believe and most of the experts also say that the success of SOA highly depends on three key aspects such as people, process and tool. The people in the enterprise play a major role in bringing the SOA a success by adhering to the SOA principles which is a change from the traditional software processes. There should be enough tools in the enterprise to support the SOA in terms of bringing the design time governance, etc. Finally, the processes should be defined and should be supported by people and tools. These processes are defined in keeping the organization's nature, domain, and culture etc. in mind so that it is followed by everyone in the enterprise.

Similar to software development life cycle, there is service development life cycle exists and it has been proposed by different authors in various books. Based on the service usage and the processes followed in the organization, the maturity levels are defined as SOA CMM. This maturity levels determines the how efficiently the services are used and the SOA principles are followed within the organization. At the Level 5 of the maturity model for service-oriented enterprise,

the enterprises needs to be agile, intelligence focused and performance oriented. In order to be at this level, the semantic web services concepts needs to be introduced in order to bring some of these benefits technically.

There is plenty of research happening in the field and semantic web and semantic web services. We have identified a couple of areas from the existing systems and processes and tried applying the semantic web services concepts and technologies. SOA governance is a key for the successful implementation and adaptation of SOA into the enterprises and we had chosen the run-time governance as our focus area. The run-time governance brings many aspects to the enterprises like security, monitoring, logging, etc. which is essential for production level services exposed to different external users. During our study, we listed the limitations of the existing SOA run time governance and proposed a system with the help of semantic web services which will overcome these limitations.

We have also seen the number of web services which are available in the internet today for consumption is growing at an extremely high rate. We can find similar services for the same purpose technically and hence it is becoming a major challenge of finding the right services. In the existing method, the developer needs to understand each service by going through the details manually and choose the right service. The dynamic discovery of web services is one of the key aspects in the semantic web services and we found that there are enough tools and algorithms available in this space. However, we thought of applying this concept in a domain with the industry standard reference architecture and document the results. This will clearly bring out the advantages of using the semantic web services concepts.

We had chosen telecom domain and during our study, we understood the service delivery platform and its usage in the telecom domain. There are several vendors who offer solutions in this space and there are reference architectures

available from standard bodies like TM Forum and OMA. We used this reference architecture and proposed a layered architecture which is based on semantic web services concepts. During the experiment, we focused more on the discovery aspects in the proposed architecture to list down the benefits of semantic web services.

To summarize this thesis work, the following tasks were done in the same order:

- Understanding the SOA and its importance in the context of agility and to be competitive in the business
- Understanding the various service development life cycles available in the industry
- Studied about the SOA maturity models and understanding the level 5 of the model for service oriented enterprises.
- Understanding of the semantic web services concepts and the related tools, standards available
- Identified two focus areas in the SOA which are governance and discovery of services. Understood the limitations and issues in the existing system.
- Proposed a system for dynamic SOA runtime governance using semantic web services.
- Proposed a semantic based service delivery platform for better service discovery using the semantic web services
- Documented the results and the comparison is done between the existing and the proposed system.