ABSTRACT

The world of computing has evolved over the years from mainframe computing, through personal computing, network computing, distributed computing, grid computing to the more recent, the Cloud computing. Cloud computing is a promising computing paradigm wherein the computational resources such as processors, storage, software applications etc are provided as 'services' to the clients over high bandwidth networks. The Cloud computing technology itself is an amalgam of a variety of legacy technologies and concepts such as distributed computing, grid computing, virtualization, Software-as-a-Service (SaaS), Service Oriented Architecture (SOA) and Web Services, to mention a few. The software applications running in the cloud and offered as services to the clients are referred to as 'Cloud Software-as-a-Service' or 'Cloud SaaS'. These software services in the cloud may be targeted on different platforms.

As the hardware and software technologies are constantly evolving at a tremendous pace, the IT industry is persistently faced with the challenges of technology obsolescence. These changing technologies have more serious ramifications in business-to-business (B2B) context. Therefore, it becomes essential to promote a technology agnostic software development approach that could alleviate the undesirable effects of technology change. In this perspective, the Model Driven Architecture (MDA) becomes a preferred methodology for developing software applications.

Model Driven Architecture (MDA) is an approach where the modeling activity drives the process of software development. The models are the prime artifacts and are used to represent various aspects of the system at different levels of abstraction, through architectural separation of concerns. Automated or semi-automated transformation tools are used to perform model-to-model (M2M) and model-to-code (M2C) transformations.

This research work is an attempt by the authors to converge Cloud computing, SOA and MDA in the development of optimum software solutions. It accentuates the need to enhance the development of Cloud SaaS by leveraging MDA and SOA paradigms. The software applications in the cloud may not exist in isolation and may require interacting with each other in order to accomplish a task. Therefore, interoperability among software services is an important issue for consideration in Cloud computing. Since SOA inherently nurtures interoperability, it would enhance the integration of and interaction among the cloud software services. Thus, developing SOA-based cloud software services
will not only ensure interoperability but also will facilitate deriving their full potential and benefits. It is in this context, this work presents an MDA-based model-driven approach to ensure interoperability among the cloud software services based on the SOA.