ABSTRACT

The evolution of Web Service (WS) dramatically changed the traditional way of paper-based business interaction into a digital-based business interaction. The web service registry act as a repository where all service providers publishes their service. The automatic semantic query processor enables consumers to easily search, find and consume the requisite service from the repository. The succeeding inception of web service namely "semantic web service", spurt a revolution, that enables the machine to automatically understand, process the given request, discover, select and compose all the requisite heterogeneous services semantically using Semantic Web Service Composition (SWSC).

The SWSC is bound with people's everyday lives as shopping, entertainment, booking, and health monitoring, etc. Though, the modern digital platform shirked the world within human's hand, conversely, the same digital platform act as a root for security and privacy disputes for participating users' data due to the centralized control of the service platform by middle parties and centralized parties. This urges a need for a secure and privacy-vested semantic web service framework to enhance the trustworthiness of Semantic Web Service Composition. Furthermore, in the existing SWSC, if any disputes arise while consuming the service or after consumption of the service, it is difficult to find the history and origin of the service provider. Hence, there is a need to properly trace service providers and their promised service data. Enhancing the security, privacy, and legitimacy of the web service platform and provider alone does not decide the trust over SWSC, additionally the experience ratings of consumers who consume the service significantly affect the recommendation of the service to another consumer. Hinged on this ground truth, there is a need for consumer’s feedback loyalty prediction.

Based on the study, it has been found that recently emerged Blockchain Technology, along with the smart contract, has the characteristic to overcome the existing security, privacy, and trust issues in Semantic Web Service Composition. However, the key challenge hinges on creating a smart contract in the Blockchain platform and enabling a seamless interaction of the SWSC for the given request. The research findings mainly focus on building a Blockchain-based SWSC Framework and concentrate on enabling the automatic execution of the SWSC process for the given request to overwhelm the existing challenges.

Besides, the Knowledge-based Genetic Algorithm is adopted to optimize the Deep Learning model to enhance the service discovery process. In addition, the GA has adopted for optimal feature selection to improve the feedback loyalty prediction for the service selection process.