**Service-Oriented Architecture (SOA)**

As the name suggests, there will be nothing to work with to give the business solution with the service's absence. Therefore services are the building blocks of an SOA. Multiple systems are interconnected to increase the functionality of the business. Developers are granted access to these services by calling online APIs. An example is Facebook, where other applications can post on it even though it is entirely different. An SOA also ensures that data is reused. In the case of Facebook, the developer gets an XML message that can be used to read data and transfer their data into the other application. To achieve the reuse of modular components, SOA uses services that are loosely coupled. According to (Hewitt 2009), the main aim of SOA is that services are created to operate together with other unknown components being loosely connected to give the business solution.

RESTful, JAX-RS, and Java API are used for creating these services used by SOA. The REST Web services are modern and lightweight, which is made as easy as possible for the user and server to interact through the HTTP protocol. There are no rules and specifications that govern the developments of these services like they are in SOAP Web Services.

**Strategic considerations in the implementation of Web Services**

Implementation of web services involves developing new web services or improving the existing web service. The web service stack will provide tools for implementation using the bottom up or top down approach during execution. According to (Bultan, Su, & Fu, 2006), web services develop a conversation between each other through messages. The conversion process may be synchronous or asynchronous. In this paper, web services are specified in two ways since SOAP requires specification of the protocol. The specifications ate bottom-up and top-down approaches. In the bottom-up, each service of the web service is specified separately, and analysis is done to the combined behavior of each service. In the top-down approach, the overall desired behavior is defined then, and individual services are not considered that much. If the service is compatible with the general behavior, then it is an accepted service implementation. In addition, at the bottom-up, the code file is created first. It can also be used where the codes are already available.

In the top-down approach, we come up with the visitor's file first containing the messages used. The web services are SOAP and WSDL, which stands for Simple Object Access Protocol and Web Services Description Language. Unlike REST, SOAP uses a standardized format of a protocol called SOAP protocol. WSDL is a document used for service definition containing all the details of what the service does so that the client can know the service's details before calling it. This document is a standard document for SOAP Web Service, but REST rarely has a service definition.

**Alternative Web Services Implementation**

RESTful services have gained popularity in deploying services to the internet over SOAP Web Services. The main reason is the lightweight of the RESTful web services and HTTP used for data transfer, making the interaction between the client and the services accessible (Gardois et al., 2012)

Development of RESTful web services is accessible by using the JAX-RS and Java API since it gives room to test, build accessing applications to the client's web services, and create the codes for calling the web services. REST messages are not interfered with by the firewalls since they use specified operations in HTTP, which are familiar with the firewall.

Due to excellent performance, reliability, and scale, most developers tend to choose REST over SOAP. In designing, REST is easy and straightforward for implementation alternative to SOAP which is a heavyweight.

**References**

Bultan, T., Su, J., & Fu, X. J. I. I. C. (2006). We are analyzing conversations of web services. *10*(1), 18-25.

Hewitt, E. (2009). *Java SOA Cookbook: SOA Implementation Recipes, Tips, and Techniques*: " O'Reilly Media, Inc."

Gardois, P., Colombi, N., Grillo, G., & Villanacci, M. C. (2012). Implementation of Web 2.0 services in academic, medical and research libraries: a scoping review. *Health Information & Libraries Journal*, *29*(2), 90–109. https://doi.org/10.1111/j.1471-1842.2012.00984.x