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WHITE PAPER

SERVICE ORIENTED ARCHITECTURE MODERNIZATION – WHAT'S NEXT ON THE ENTERPRISE DIGITAL JOURNEY

Abstract

For several years, organizations have been using service-oriented architecture (SOA) as an integration technology to help IT keep pace with the business. However, in today's fast-paced world, there is a clear need to revisit the existing SOA and consider whether to modernize it for present and future requirements. This paper examines how SOA modernization benefits organizations. It also providers the options available for enterprises using Oracle platforms along with a decision tree analysis on these options.

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Introduction

Service-oriented architecture (SOA) is a proven software design pattern widely adopted by organizations to integrate highly complex application landscapes for the past 20 years. It has helped enterprises streamline architecture and move towards a cleaner system design. Nevertheless, all integration technologies must evolve if these are to continue improving efficiency and innovation. Thus, SOA modernization must be tuned to upcoming industry trends. Enterprises have several options to analyze and modernize their integration landscape by upgrading to Oracle SOA 12c platform.

What is Driving the Shift to SOA Modernization?

Along with challenges posed by traditional SOA systems, there are several emerging trends that are making modernization an imperative.

Challenges of traditional SOA systems

Most traditional SOA systems were designed for organizations where software was deployed on-premises and ran on a few large servers. With the rise of cloud computing and microservices, this model is no longer progressive. Modern SOA systems must be cloud-native, deployable on multiple cloud platforms, and use modern DevOps and containerization technologies.

Moreover, traditional SOA systems were not designed to handle the scale and complexity of modern data. As data volumes grow, enterprises need systems that can process and analyze large amounts of data in real-time. Modern SOA systems can easily handle high volume and high velocity data by efficiently using the underlying infrastructure in a shared mode.

Finally, traditional SOA systems were not designed for business analysts. With the rise of the low code/no code (LCNC) paradigm, enterprises are realizing the need for systems that empower business developers to keep pace with changing business needs.

Key industry trends

The three core pillars of cloud computing – software-as-a-service (SaaS), platform-as-a-service (PaaS), and infrastructure-as-a-service (IaaS) – have compelled organizations to adopt newer technology mechanisms. There are many trends that are re-imagining the overall integration domain:

Cloud-native integration solutions – Organizations are increasingly moving their IT systems towards cloud-native development and related platforms. This trend involves building integration solutions, specifically for cloud environments hosted on Oracle, Amazon Web Services (AWS), or Azure. It also involves taking advantage of cloud-native adapters and out-of-the-box services on high performing serverless computing and Kubernetes.

Microservices – Microservices architecture allows organizations to break down monolithic applications into smaller, independent services. These can be easily and independently developed, deployed, and managed. It increases the flexibility and scalability of integration solutions and allows organizations to easily adapt to changing business requirements.

API-based integration – API-based integration allows organizations to abstract existing systems and data as a set of APIs that can be consumed by other systems. It simplifies integration and increases the flexibility of the integration landscape.

Event-driven architecture – Integrating event-driven architecture with SaaS systems will allow organizations to decouple systems and services by sending and receiving messages as events. It also enables seamless integration with third-party systems.

Low/no code integration – Low/no code integration platforms have become highly popular as they allow non-technical users to create, manage, and monitor integrations without having to write code.

Hybrid integration – Hybrid integration is a combination of traditional and novel integration methods such as API-based integration and event-driven architecture. It assists organizations in taking advantage of the best features of different integration methods.

Challenges for Enterprises using Oracle SOA Suite of Products

Oracle Fusion Middleware is a comprehensive middleware solution for large global enterprises. While digital transformation has compelled many Fortune 500 organizations to move to Oracle Integration Cloud (OIC), many continue to successfully leverage traditional benefits using the latest Oracle SOA 12c platform.

In today's extremely competitive, cloud-native marketplace, Oracle SOA 12c presents many challenges. It has heavy dependencies on traditional standards of development such as Business Process Execution Language (BPEL), Business Process Management (BPM), and Enterprise Service Bus (ESB), which have low productivity and high turnaround time. Moreover, enterprises need to modernize their systems to address the heavy costs as well as business challenges of using the Oracle SOA suite of products. Navigating the modernization of an ever-changing integration landscape can be overwhelming for enterprises that run on Oracle SOA 12c.

Options for Enterprises using Oracle SOA 12c

With the right approach and analysis, organizations operating on Oracle SOA 12c platforms can modernize their integration landscape and stay ahead of the curve. Here are some recommended approaches:

SOA Modernization Decision Tree by Infosys

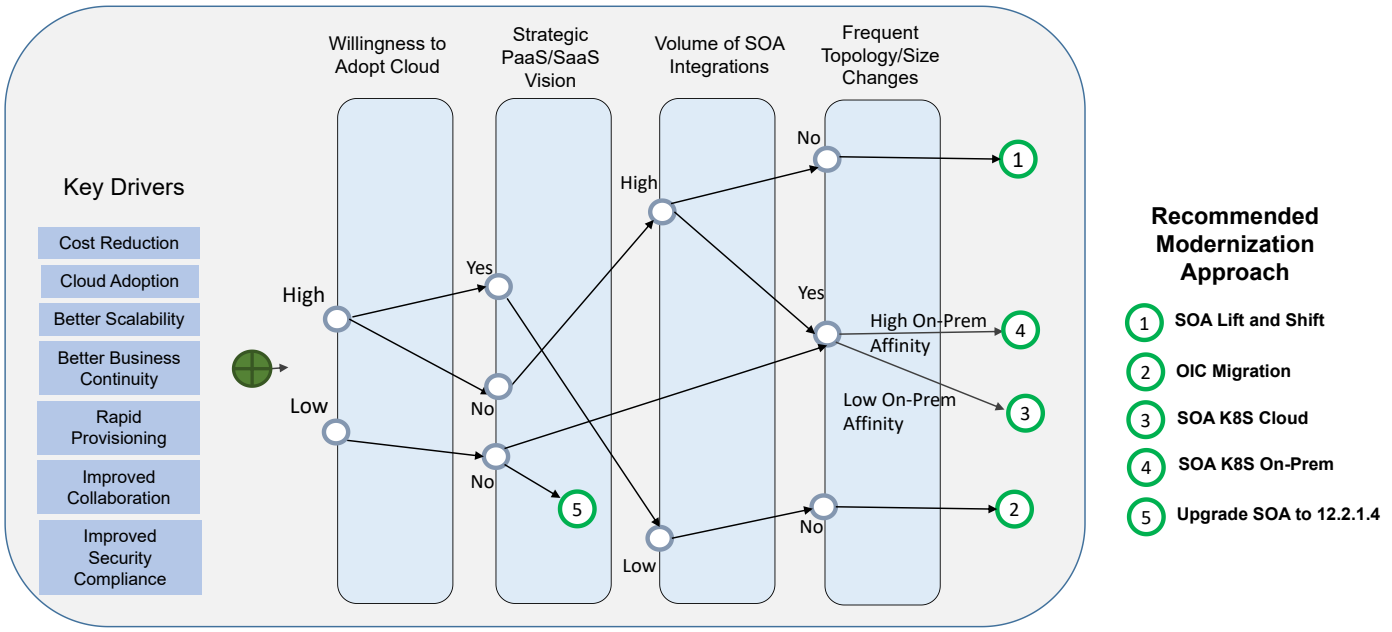


Figure 1: A decision-tree analysis of the available SOA modernization approaches

1. Lift and shift

This approach helps organizations to quickly move their existing on-premises SOA to cloud infrastructure on IaaS. The main aim is to minimize the level of changes made to the existing architecture and quickly establish a presence in the cloud environment.

The existing SOA components are shifted from the on-premises environment to the cloud without making significant changes to their design or implementation. This approach is best suited for organizations that want the benefits of the cloud such as increased scalability, reduced costs, and improved accessibility, without making major changes to their existing architecture.

2. Move to Oracle Integration Cloud (OIC)

This approach is the natural progression to a modern stack for any enterprise. It is highly recommended for organizations that intend to adopt SaaS and PaaS services in the future. The main objective of this approach is to restructure the existing SOA to align with cloud-native architecture.

The existing SOA components are re-implemented using OIC to take advantage of its cloud-native features such as native integration with SaaS and PaaS services and enhanced scalability and reliability. In comparison to the SOA lift-and-shift approach, this method requires more time and effort. But, it gives organizations a more flexible and scalable architecture that is better suited to cloud-based environments.

3. Retain SOA on-premises

This approach is recommended for enterprises that want to leverage the benefits of both service-oriented and cloud-native architectures through a flexible topology by deploying them on a common platform.

The existing SOA components are deployed on the Oracle Kubernetes platform. This provides a flexible and scalable infrastructure that can run both traditional SOA and the cloud-native applications, enabling organizations to have the best of both worlds, i.e., the reliability and stability of SOA as well as the flexibility and scalability of cloud-native architecture.

4. Dockers for SOA on-premises

This rarely-used approach is suitable for organizations that want a flexible and scalable infrastructure topology along with SOA on-premises that can run on virtual machines.

The Oracle Kubernetes platform is deployed on-premises on virtual machines. It gives organizations a flexible and scalable infrastructure to run their SOA components on-premises so that they can enjoy the benefits of improved scalability and reliability of the Oracle Kubernetes platform.

5. Ensure the latest release

Multiple factors such as cost benefits, security policies, and organizational strategies weigh in on whether an enterprise needs to retain their SOA suite on-premises. In such cases, we recommend upgrading the Oracle Fusion Middleware (FMW) stack to the latest version, i.e., 12.2.1.4.

Factors for Optimal Selection of SOA Modernization Approaches – A Decision Tree Analysis

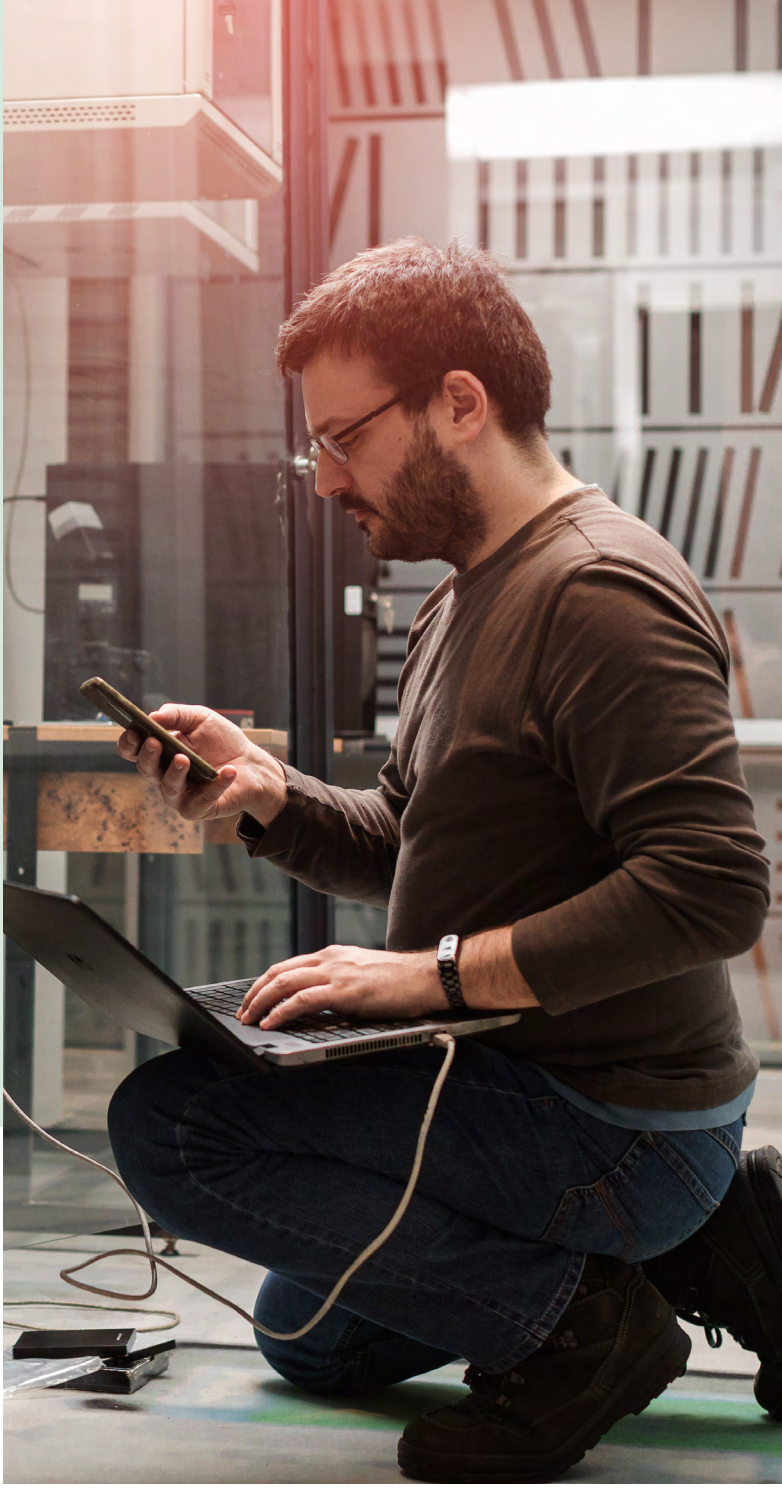
1. Willingness to adopt cloud

One of the key considerations for SOA modernization is the willingness of the organization to adopt cloud technology. Organizations should carefully evaluate the benefits and risks of cloud computing, such as improved scalability, reliability, and performance, as well as potential security and compliance concerns. They should also assess the impact of cloud adoption on their existing IT infrastructure, processes, and staff.

2. Strategic PaaS/SaaS Vision:

Another key consideration is having a strategic Platform-as-a-Service (PaaS) or Software-as-a-Service (SaaS) vision. This involves defining the desired state of the SOA architecture and identifying the necessary steps to get there.

Organizations should assess the current state of their SOA architecture, including existing services, integrations, and infrastructure, and determine how they can migrate to a cloud-based architecture. They should also consider the role of emerging technologies, such as microservices and containers, in their modernization strategy.



3. Volume of Integrations

The volume of existing integrations is another important consideration for SOA modernization. Organizations should assess the complexity and criticality of their existing integrations and determine which ones are the right candidates to be migrated to a cloud-based architecture. They should also consider the impact of migration on their existing IT infrastructure.

4. Frequency of Topology Changes:

The frequency of topology changes can be a factor to choose the right option for SOA modernization. Frequently changing architectures should consider Oracle Kubernetes platform to provide the flexibility to accommodate such frequent changes.

Key Takeaways

SOA lift and shift: Quick migration to the cloud with minimal changes to the existing architecture

Re-implementation of SOA to OIC: Cloud-based SOA for future SaaS/PaaS adoption

Oracle Kubernetes platform for cloud: Flexible infrastructure and cloud-native applications with SOA

Oracle Kubernetes platform on-premises: Flexible infrastructure for on-premises SOA and cloud-native applications

Upgrade SOA to the latest release: Upgrade the completed FMW stack to latest release to take benefit of latest features and continued product support

Cloud Migration: Planning, Preparation, and Execution

Cloud migration is a complex process that requires careful planning, preparation, and execution to ensure successful outcomes. Here are the key considerations for organizations when embarking on the cloud migration journey:

Assessment planning

- Assess the landscape: Assessment of the current integration landscape involves a thorough understanding of its systems, applications, volumes, protocols, and security requirements
- Define the objectives: Organizations should articulate the objectives of the cloud migration such as improved scalability, reduced costs, increased agility, and enhanced security
- Conduct resource planning: An evaluation of budget, staff, and timelines is necessary to determine what can realistically be achieved and the resources needed to execute the migration
- Select a cloud provider: It is important to choose a cloud provider and cloud environment that can meet the organization's specific requirements

Preparation

- Define the cloud migration strategy: A comprehensive migration strategy, including a detailed project plan, should be designed to ensure successful outcomes
- Prepare the catalogue: Determine integration points and dependencies, document the integrations, and finalize/publish the integration modernization scope
- Evaluate security requirements: Ensuring data security and privacy is a critical aspect of cloud migration. Security requirements should be assessed and planned accordingly

Execution

- Migrate the integration resources: The integration resources must be migrated/re-implemented. This includes moving configurations, connections, security artefacts, transformations, and integration codes to the cloud environment
- Monitor and manage the migration: Monitoring the migration and managing any issue that arises is a critical aspect of the execution phase
- Implement governance and management processes: Establishing governance and management processes for the cloud environment is necessary to ensure the ongoing success of the cloud migration program

Cloud migration requires significant investment of time, resources, and expertise. By carefully planning, preparing, and executing the migration, organizations can ensure successful outcomes and realize the benefits of a cloud-based IT environment.

Conclusion

Organizations that modernize their integration landscape to cloud-based platforms and advanced technologies will be better equipped to handle changing market conditions and customer needs. SOA modernization can help such organizations improve scalability, reduce costs, increase agility, enhance security, and boost collaboration, thereby giving them a competitive edge in today's fast-changing business world. Organizations must act now to modernize their SOA so they can position themselves for the future and remain competitive in the ever-evolving market.

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Arpit has 15+ years of IT experience and has honed his skills in designing, implementing, and supporting integration solutions for a wide range of clients across various industries. As SME in integration space, Arpit possesses rich experience working on cloud migration projects and has deep understanding of building Enterprise Fusion Middleware environments on both Oracle and MS Azure Infrastructure. He is proficient in wide range of FMW and PaaS technologies : Oracle SOA, Weblogic, OIC, VBCS, and SOACS.

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Gaurav has over two decades of experience in Oracle Technologies. His expertise includes Presales, Architecting and Designing of Integration Solutions for large IT and Business Transformation Programs. He is a key member of Infosys Competency Center at Oracle Practice focusing on Platforms and Integrations. He has successfully led multiple implementations with Global Enterprises on Oracle Fusion Middleware and Oracle PaaS platforms.

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