Royal Cyber Technical White Paper

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Service Oriented Architecture (SOA) Implementation

To deliver Secure and Scalable Platform

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1. Introduction

This white paper is an introduction to SOA project that Royal Cyber did for the client. This paper discusses business objectives of the client, the importance of SOA, How we implemented SOA framework and the advantages to the client.

The target readers for this paper are Technical Architects. They would find the information in this document useful when they need to design a solution that will address these business requirements.

2. Business Objectives of the Client

Business objectives which were fulfilled for the client from the implementation are the following:

1. Accelerated time to market new and evolving products
2. Good governance and business process management
3. Cost efficiencies from integration
4. Improved time to respond to customer issues
5. Enterprise agility to regulatory changes
6. Allocation of scarce computer resources based on customer segmentation
7. Customer authentication best practices
8. Workflow automation and lifecycle management of the Bank's services
9. Support to speedier decision-making
10. Computerized traceability – including policies, roles, service level agreements and messages

3. Key Requirements

The project addressed two main functional requirements of the Client:

1. **Service Oriented Architecture Integration Framework**: This was the shared infrastructure platform which empowered client's business leaders, program managers and architects in retail banking to create, deploy, govern and change enterprise processes. The aim was to accelerate their response to changing demands in their products and markets and enhance their efficiency to integrate their offered services to their end customers, without needing deep knowledge of software platform, language, database, middleware and hardware.
2. **Interface between Client and Online SADAD Electronic Bill Payment:** The interface between Client and SADAD Electronic Bill Payment delivered each of the following **four business / functional requirements**:
   - ☐ **Strategic Requirements:**
     - ○ **Core Business Opportunity:** Client can position to their customers the ability to electronically pay their domestic bills on client infrastructure and win customer loyalty.

- o **Trusted Brand Visibility**: The interface provides visibility of client brand and its logo to client customers, thereby enabling customers to recognize the client brand while making bill payments.
  - o **Requirement of Continuous Evolution:** If evolution of the interface becomes a necessity because of changes arising from SADAD or other participants of electronic bill payment, service-centric process design gives the interface the much needed agility.
- ☐ **Marketing Requirements:**
  - o **Interoperability of Solution:** Client customers will not be forced to stay with a limited set of telecommunication networks, internet browsers and mobile devices (and their vendors) when using electronic bill payments.
  - o **Consistent Customer Experience:** Acceptance by customers decides the success or failure of a bank's customer-centric programs. By integration with the existing user interface, this interface will provide consistent user experience on web browser, mobile browser and smartphone app.
  - o **Marketing Collaboration:** Service-oriented architecture offers benefits of service standardization, loose coupling, abstraction, reusability and discoverability. Therefore, client gains flexibility and speed of product definition in collaboration with partners, in response to emerging market requirements.
- ☐ **Regulatory Requirements:**
  - o **Compliance with Banking Legislation:** Banking laws will continue to change domestically and internationally. By design, Electronic Bill Payment interface gives the business leaders of client the ease of compliance with ever-changing banking legislation.
- ☐ **Technology Requirements:**
  - o **Modularity of Technologies:** The interface comprises a set of interoperable application modules that work seamlessly together end-to-end, from the end-user device until the national service provider SADAD, offering convenience and simplicity for client customers.
  - o **Reliability Robustness and Fault Tolerance:** To ensure adoption by client customers, the reliability of service offered by the bank is a deciding factor. Additionally, availability on a continuous basis and ability to run stably and continuously without regular manual intervention (for example, rebooting and installing of software patches) will encourage customer acceptance. Capability of quick recovery from disasters and other problems and being self-protecting, that is, ability to prevent unauthorized attempts to access private customer data will offer competitive advantage to client.

4. Importance of SOA

The client was looking to provide accessible products & services to their customers. The aim was to encourage modernization and to digitize processes on all levels.

A true Service Oriented Architecture (SOA) with microservices consideration was the way forward. The flexibility of SOA combines both business and IT requirements that can be easily integrated and adapted. Also the legacy systems can be integrated and different views of a source can be achieved.

The client utilized a well-governed SOA platform with open service interfaces to provide existing systems such as application programs as services. These open interfaces enabled all users and processes to access these functionalities while also allowing for seamless cooperation and data exchange between individual processes.

SOA provided the bank flexibility and standardization when it comes to dealing with new requirements. SOA covered every level within an organization, business processes, business services and IT services.

5. Client Project Implementation

The architecture was built using True SOA Architecture by utilizing IBM SOA Technology stack: DataPower, WSRR (SOA governance), IBM Business Monitor, IIB for **Phase#1**. The solution was built to adapt IBM Decision Center as Well as Business Process Management. The client aimed to migrate one of the core services within the bank (Electronic Bill Payment – SADAD) while considering business continuity and running in parallel with the legacy system.

Royal Cyber used IBM DataPower Crypto Manager Service for encryption and decryption, mutual SSL, Partner/Channel Authentication and Authorization for the services. IIB (IBM Integration Bus) Framework was used which had multiple components that could be easily extended & adapted by new implementations.

The IIB framework had custom patterns that helped in standardizing the coding and design practices. IBM Business Monitor provided comprehensive business activity tracking to help boost business agility. It offered notifications and alerts, customizable dashboards to offer close to real-time visibility into business operations, transactions and processes for high-quality business insights.

This was based on the organizational and technical integration of the operational management and supporting information technology. Royal Cyber's focus on this solution along with its technology partners ensured that the concept is implemented efficiently & effectively.

5.1 SOA Framework

- Integration Bus Integration Framework consisted of multiple components which were capable of being easily extended & adapted by new and existing implementations.
- As per client's requirement, the framework had Custom Patterns. Those patterns were used in components.
- This helped in standardizing the coding & designing practices.
- Pre-defined components cut down development efforts, thus reducing IT budget. Most of flow implementation skeleton & code was ready at the start of development.
- Framework components were configurable, that provided development time & runtime options to switch on/off functionalities or change the behavior of flows runtime.
- Performance Management component provided added value as it would track & manage slow responses services
- Dynamic Routing component not only provided the flexible routing, but also provided increased throughput for services

Integration Framework Architecture Diagram
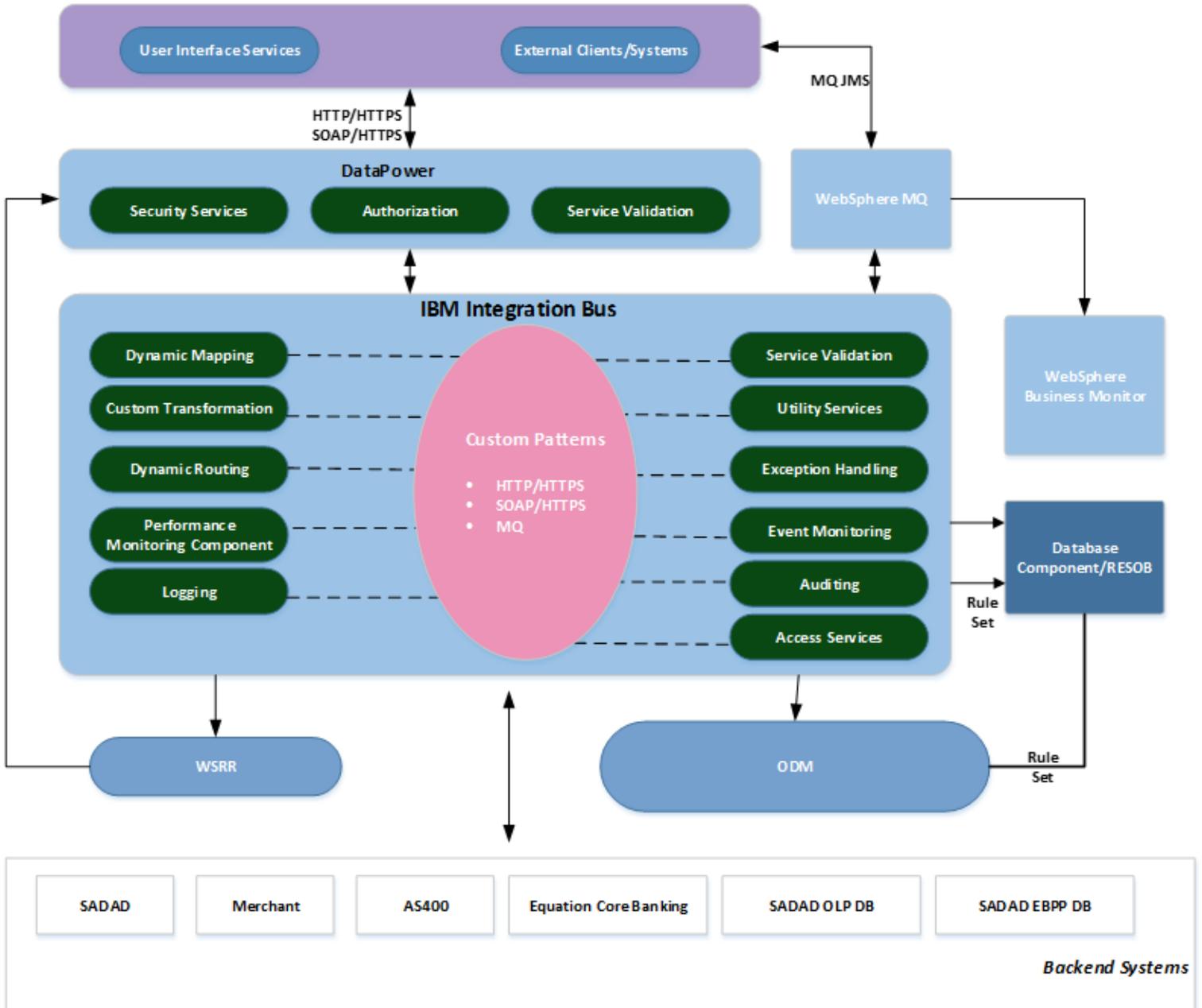
6. Benefits

Business benefits which client derived from SOA implementation are the following:

1. Enhanced customer experience and higher return on IT investment
2. Regular surveillance over performance of financial payment messages gives management real-time information
3. Capability to drill-down and get visibility to the incident level reduces response time of Customer Care representatives facing an irate customer
4. Component-based modular development promotes agility within the banking enterprise
5. Authoring of content for e-mail, SMS and push notifications through a centralized Content Management System on the Bank's intranet makes it easy for the Bank to release new information to its customers
6. Combining of data from disparate IT systems into an easily understandable one-page dashboard view through pictures and graphs
7. Business rules can be set to notify an administrator when there is a problem, assuring that business-critical applications and functions are given priority

7. Conclusion

Royal Cyber's SOA implementation for client ensured that services are agile enough to respond quickly to market forces that call for changes to services. It is a challenge for banks to successfully reuse their existing services and rapidly put together to reconfigure applications and processes so that their projects are on time and within budget.

The client can now offer good governance and accelerated time to market new and evolving products. Moreover, it can have a computerized traceability of policies, roles, service level agreements and messages.