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SERVICE ORIENTED ARCHITECTURE DESIGN FOR WEB BASED HOME BANKING SYSTEMS WITH CLOUD BASED SERVICE

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Abstract

The aim of this work is to design and develop software as a Service (SaaS) for cloud environment using SOA principles. Globalization continuous to pressure the banking industries for increased collaboration within their value chains. The banking industry, a virtual backbone for all other industries, feels this pressure both within their industry and with those they serve. Collaboration demands technology integration, and approaches so far have resulted in redundancy and inefficiency wired together with inefficient systems. Software services offered on cloud on pay-per-use basic. The proposed SOA model can help reduce redundancy, inflexibility and inefficiency in crucial banking processes such as payments, multichannel integration and account opening. Banking must address changing customer expectations and needs, emerging competitive threats, and an unknown and changing regulatory landscape.

***Keywords*-- Service Oriented Architecture, Cloud Computing.**

I. INTRODUCTION

In recent years, the emergence of the service providers are increasingly active and the service oriented architecture technology [6][7] matures due to the popularization of cloud service **[**1]. The principle concept of this study is "Software as a Service". At the most fundamental level, the cloud story is a story of IT transformation- a new paradigm in banking sector use and intact with technology. Banking has been doing this for centuries what has changed is the ways in which institutions can now leverage technology to achieve those objectives. Cloud computing is and will transform the IT value chain from designing, building, and maintaining systems to the new role of procurement and brokerage of IT-based services. Cloud computing in the banking sector must of which are determined by service level agreement requirements and by the need to secure and protect customer data. Various financing options and pay models are available for cloud and utility service solution. The cloud-based solution fully complies with your compliance standards and is acceptable to your risk and security officers.

Banks can create a virtually unlimited number of combinations of any size or shape. This modular concept is at the heart of SOA.

Now, due to open business and technology standards, service components from institution applications can be combined with those of its partners, suppliers and even its customers to create new "Super Application" composites of functionality that can span companies and industries. Internet, customers are putting more pressure on banks to make payments faster, less costly and increasingly more customized. There is certainly an inexorable more toward electronic payments and invoicing, meaning that banks must follow suit.

Banking sector to increasingly realize that integrating or utilizing existing applications for establishing a new business practice or application is a major challenge given the programming models or technologies on which the existing application. The banking sector to create a new process for doing business with partners, suppliers, customers, or employee, reusability of existing systems is the key to attain the following objectives,

*Integration across the enterprise.
*B2B and B2C integration
*Lowering Cost
* Faster time- to-market

A number of situations warrant the deployment of new applications, for new connectivity channels, implementing new protocols and back office re-engineering.

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An SOA framework is being touted as the solution by the industry. Today, these are exciting new developments such as web services and utility computing which provide a boost to the SOA implements action frame work.

II. Background And Definitions

2.1 Service Oriented Architecture (SOA)

Service oriented architecture (SOA) is a business-centric IT architecture approach that support business integration. A deployed integrated suite of service that is reusable, platform independent and can communicate with each other.

2.2 Cloud Computing

Cloud computing is not yet a standard definition, but most are talking about cloud services is to provide IT resource as a service, including IaaS, PaaS, SaaS and other users rely on internet to meet the computing needs of technology trends.

i) Infrastructure as a Service (IaaS) – Build on top of data center layer, IaaS layer virtualizes computing power, storage and network connectivity of the data center, and offers it as provisioned services to consumers.

ii) Platform as a Service (PaaS) is between the underlying physical architecture and among upper applications. It has a more complete operating environment for program developer to open platforms and operating system, and integrate the required functionality to application.

iii) Software as a Service (SaaS) belongs to the top of the application, it provide software application service over the network. Users can access service anywhere and anytime. The software is often shared by multiple tenants, automatically updates from the clouds, and no additional license needs to be purchased.

2.3 Comparing Cloud Computing and SOA

Cloud computing[10][11] and SOA have important overlapping concerns and common considerations, as show in **figure 2.** The most important overlap occurs near the top of the cloud computing stack, in the area of cloud services, which are network accessible application components and software services, such as contemporary web services. Both cloud computing and SOA share concepts of service oriented, services of many types are available on a common network for use by consumers.

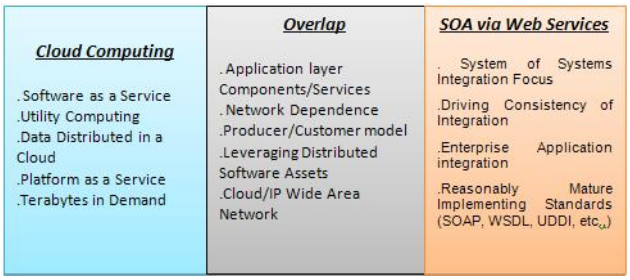

Figure 2 Compare Cloud Computing and SOA

III. Service Oriented Cloud Based Architecture

This section provides architecture[2] – design details of prototype implemented by us for SaaS and cloud based banking application Software as a Service to address the system stakeholder requirements such as payments, multiple channels and Account opening.

Figure 3 show the logical components in the architecture. (Online Payment, Account Opening, Multichannel)

3.1 Banking Architecture Design Goals

The software should be designed for reusability, Interoperability and Maintainability. The software design should leverage distributed, virtualized parallel and reliable computing mechanisms. The software should be designed for configurability, customizability at business process/work flow, business rules, user interface, and security layers.

3.2 SOA Services for integrating Payment Applications

Banks attempted to integrate payment applications by installing a central payment hub or gateway to deal with a specific banking payment channel. These solutions eventually evolved to gateways supporting multiple, but still specific, payment channels, and included data transformation, message formatting, logging and so on.SOA provides a way to employ reusable services to conduct the different payment transaction types. These services can be independent of the core banking application systems and the payment channels they support. New revenue sources, since new systems such as mobile payments can be integrated into existing systems. Current solutions often hinder the bank by rendering the current state inflexible and resistant to any requested changes. With SOA, the bank can easily add new payment channels and new applications to existing payments capabilities without upsetting business as usual.

Reducing operational risks, SOA can enhance monitoring, since more applications use a common approach to sending and receiving payments.

3.3 SOA Services for integrating multiple channels

Banking applications are disconnected across the organization, making it difficult to optimize existing customer potential.SOA can provide an integration layer to enterprise applications, and an all-encompassing view of the customer relationship. These interactions assuming they exist at all – are costly to maintain, inflexible, and prone to error. Channel applications– a retail branch teller or a Web-based home banking system SOA, a bank can employ different categories of services – customer information, product information, balance, Rates and fee, history and create a standard set of services to share information. A single "get balance" service, for instance, could be applied to any product where it would be relevant.SOA layer makes it easier to integrate applications, the bank can offer its customers more tailored products and services, at the premium prices the market will bear. Since information is shared in real time, control of the primary product remains with the application best suited to manage it. This helps improve flexibility, lower labor time and costs, reduce risk, and optimize the value of each customer.

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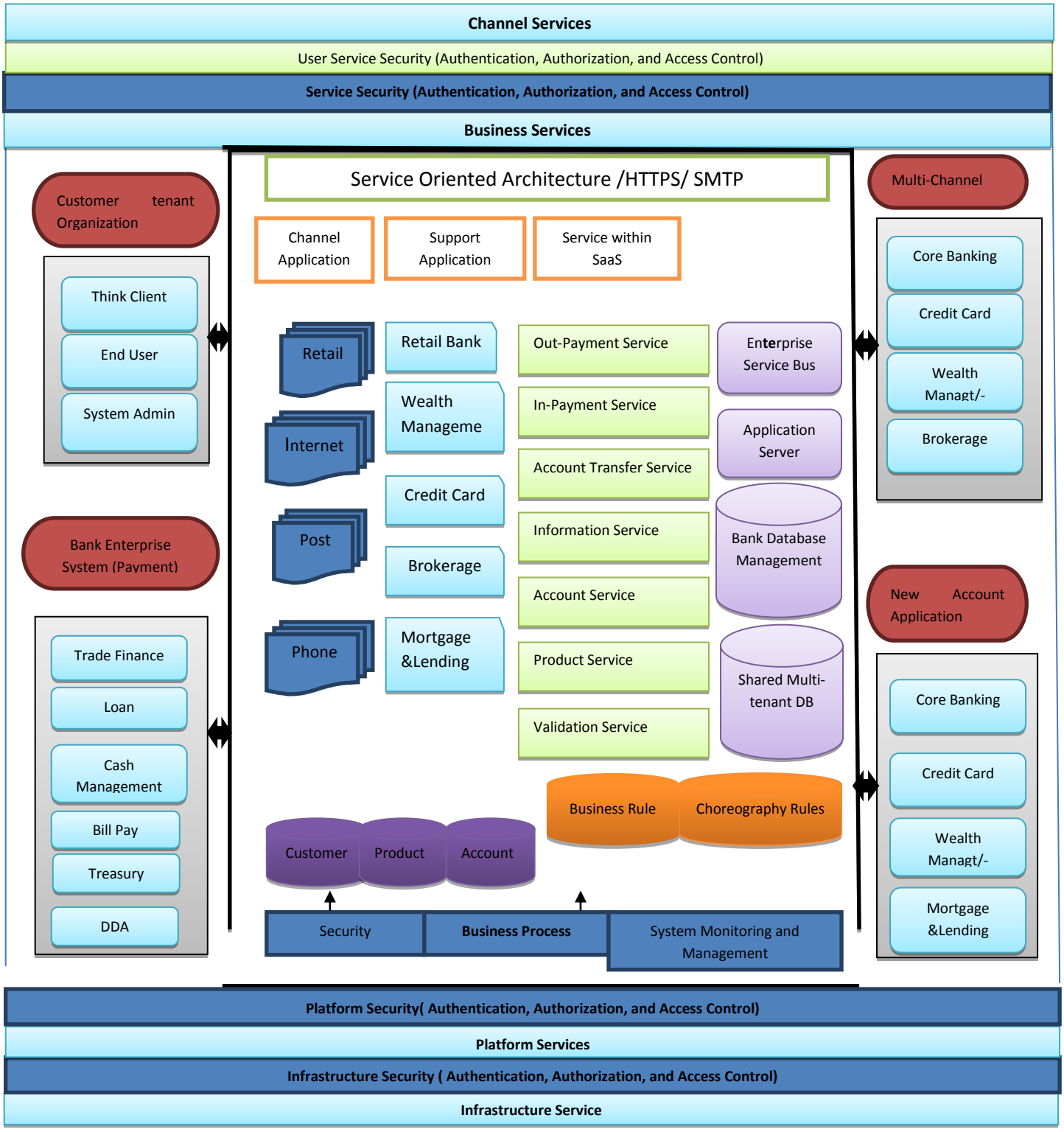

Figure. 3 Logical Components (Online Payment, Multichannel, New account Opening)

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3.4 Building a New account application using SOA Service

Account opening is a core banking function that has become a major expense, and, ironically, a potentially significant barrier to business growth. Banks must also attempt to reduce its expense– striving for that elusive goal: better service at a lower cost. This new account application is possible only if it can access the systems required, such as electronic forms and compliance. This goes beyond the read-only access required before final review. Ideally, the new account application would use SOA services to actually create the account in the product system itself. The bank would build a layer of services and use the services to access the account management functionality in the core business applications. A service to find an account may actually have a different function in each core business application. For example, the online banking application could use the SOA services directly. This type of implementation sets the basis for future reuse, and more important, IT flexibility.

IV. Deployment View Of Cloud Banking

The all service layers, regardless of deployment model (private, community, and public),[4] a banking sector must implement a consistent model to govern, provision, and operate activities across all layers. This encompasses provisioning not just the infrastructure, but all components and services required to deploy the bank service, for example, hardware, network services, operating system, database, middleware, application, and third-party service provisioning.

4.1 Infrastructure Services—Includes servers, storage, and networking, both inside and outside a banking services for data center. Many banks are currently building an internal cloud IT infrastructure. This layer is often called IaaS.

4.2 Platforms Service—A broad technology array, including application hosting environments and tools, middleware technology, development frameworks and tools, and standards applied to specific business services. Even a core banking product includes a development environment such as frameworks, scripts, languages, tools and deployment environment such as deployment scripts, monitoring, and control environment.

4.3 Business Services—Core bank services[5] such as corporate and retail banking, wealth management, treasury management, risk management and compliance, trading.

Banks have built these services in-house, the market is replacing these systems with commercial off-the-shelf packages that embrace an SOA. Some business services, such as loan origination and payments, are consumed through an external service provider.

4.4 Channel Services—Support diverse channels such as ATM, branch, call center, mail, mobile, online, telephone, video, etc. The services are tailored per channel, built on a channel-specific technology stack with some sharing across channels via bridging technology. As the number of channels, devices, and users explode, banks evolve toward single architecture that supports all channels, delivering a consistent customer experience, services, and information across all channels.

4.5 Security (Authentication, Authorization and Access Control) —the critical need for security, privacy, and control in a cloud environment. For applications that need lower levels of security and control, a public cloud may suffice. Where more stringent levels of security and control are called for, a private cloud is the logical choice. For more sensitive banking sector services applications, which call for higher levels of privacy and control, retain them on their existing environment, or consider a utility services solution, or traditional managed hosting services approach.

4.6 Scalability—The Cloud service that provide real-time visibility into resource utilization, operation performance, patterns for CPU utilization, disk I/O, and network traffic.

V. Benefits Of Proposed Architecture

The solution provides an efficient core bank service to use any time access from multiple locations. The solution reduces the TCO for IT. Performance, reliability, security requirements are addressed by the solution. Service provider is able to increase customer base due to economic software delivery provided to consumer market. Due to SOA, the solution offers reusability, maintainability of services, and easy integration, interoperability with diverse platform on which the customer and banking application systems are built. Transform IT into a source of high-value business services. Gain the agility to better respond to business, market, and regulatory changes.

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Accelerate time-to-market by reducing service provisioning time, while reducing the risk of acquiring and implementing new financial services functionality Move to a variable price-per-unit model—paying for only the capacity they need, when they need it, and nothing more. Access instant-on services that can be scaled smoothly up or down and deployed smoothly across geographically diverse banking services operations. SOA requires some specialized skills that entail a learning curve. It is best to instill these skills now. SOA is building the initial architecture. Once that's in place, additions or changes – new channels, back-office functions or business lines – can be made much faster and less expensively. Over time, the return on this initial investment can be dramatic.

VI. CONCLUSION

Global economic situation to more stringent regulatory controls, nimble new competitors, and shifting Customer expectations—bankers and others now face a dramatically different market reality. Banks must collaborate and technology must be part of that collaboration. We successfully integrated on promise and cloud-deployed bank sector for web service. SOA offers an approach to banking payments that is a progressive solution with lower cost of operation than today's alternatives. The inherent flexibility would position a bank for new payment channels and new payment sources and targets. To support multiple distribution channels, a layer of SOA services allows more flexibility for change and greater product distribution, as channel applications and channel support applications are no longer tightly linked to core banking systems. An SOA solution can also enable the opening of an account for multiple product lines that is seamlessly integrated with multiple back-end systems. The benefits can include not only lower costs, but increased revenue and optimized customer relationships. Cloud computing represents game-changing shifts in how banking services organizations acquire and leverage IT resources. The Cloud vendor provided infrastructure services are used to address scalability, performance, security, availability, disaster recovery, monitoring requirements of the systems.

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