Transforming to a Smarter Core Banking Systems Environment

By Alex Louwe Kooijmans
Senior Solution Architect for Banking, Financial Services Center of Excellence

Highlights

A volatile economic climate, ever increasing competitiveness and continuous pressure to meet regulatory requirements demand a flexible and cost-effective core banking systems environment. However, many existing core banking applications have been developed as silos, with limited possibilities for reuse and optimization. With the current state of technology, IT systems can be created that are responsive to business changes, provide intelligence to be competitive and meet service levels without compromise. IBM has an end-to-end vision and solution to transform existing core banking systems to the ideal core banking systems environment. The key attributes of this solution are a methodology, methods and tools, reusable assets, a framework architecture and workload optimized infrastructure components.

Challenges with today's core banking systems

The way in which today's economies function and grow competitiveness between banks demands a flexible IT environment. Banks must quickly be able to comply with new regulations, introduce and bundle products, enter new marketplaces, and make swift business decisions to increase profitability and revenue. An agile IT environment that can be easily and continuously adapted to changing business needs is key.

However, many core banking systems have been modified, extended, replaced and customized over time, resulting in a vast and complex web of customized code, especially when done without strong and structured enterprise-wide governance. Maintaining this code can involve significant operational cost and risk. Core banking systems were initially designed to be product-based and hinged on loans, accounts and savings. Applications and processes followed this model, driving the duplication of services, such as opening an account, across multiple product silos and customer touch-points. The core banking systems model also led to a product-based approach to systems and governance. In this approach, each operational silo implements decisions without consideration of the requirements of other business units.

Currently, changing business models, increased regulatory requirements and the need for better risk management are forcing banks to integrate systems across siloed product lines, further increasing the size and complexity of traditional systems. Moreover, transaction volume and related data have exploded during the last decade and have exponentially compounded complexity by causing a significant increase in bank operating costs. This trend is expected to continue in an accelerated manner because of the mobile channel.

Redbooks

Figure 1 shows the most commonly experienced pain points in current core banking IT systems.
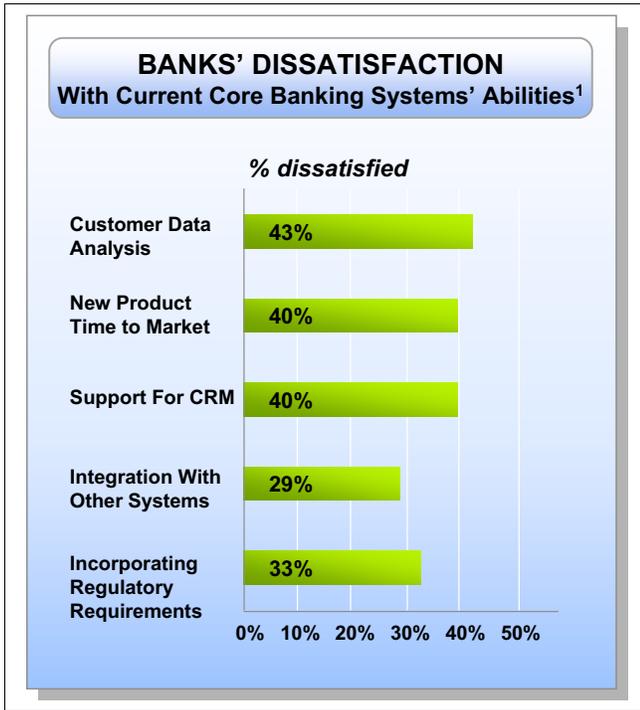

Figure 1   Dissatisfaction with current core banking IT systems as perceived by banks

Innovation, by implementing new architectures and technologies, is necessary to keep IT systems responsive to the business needs of today. In most cases, a transformation is required to create a foundation that is sustainable and flexible enough to accommodate business developments today and in the future.

Selecting the right approach

Banks can select from various approaches after they decide to embark on transforming their core banking systems. Some banks prefer to focus on a few architectural issues and then retrofit the existing systems. Other banks prefer to complete a limited transformation of a few systems. Yet other banks prefer to undertake a total systems replacement. Banks can typically select one of the following transformation approaches:

▶ The *packaged solution approach* that replaces all, or parts of, the traditional systems

▶ The *rewrite approach*, in which all, or parts of, the traditional systems are rewritten from scratch

▶ The *hybrid approach*, which is a combination of the packaged solution and rewrite approach

▶ The *customized progressive approach*, in which existing applications are transformed and enhanced in an iterative manner

Deciding on the approach is a complex thought process. The IBM core banking transformation solution can be customized to accommodate any of the approaches. It is essential to weigh in all possible decision factors, with a strong focus on architecture. For this reason, IBM also uses the term *architecture-led transformation*, because in the end, the architectural foundation determines the agility and sustainability of the core banking systems.

IBM's point of view is to lead a core banking transformation project with architecture.

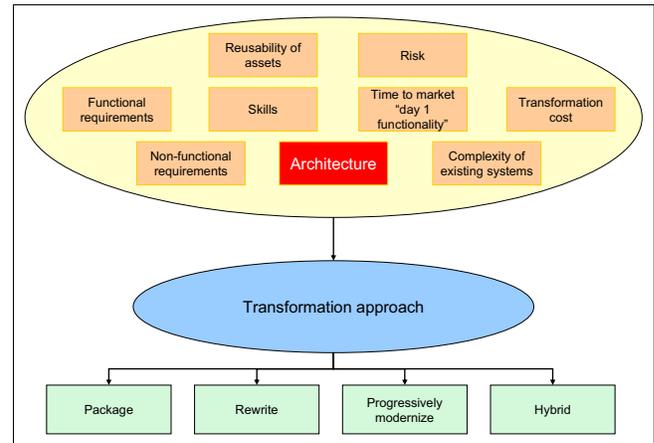Figure 2 shows the factors that determine the transformation approach.

Figure 2   Determining the core banking transformation approach

IBM core banking transformation solution

IBM brings together a wealth of knowledge and experience in infrastructure, software, project management and the banking industry. For this reason, the IBM approach for core banking transformation is a total solution, in which all of the following aspects are evenly important and critical:

- *Vision*, which is built on trends in the industry and technology and experience with current inhibitors for growth
- *Methodology*, which is custom designed for large and complex core banking transformation projects
- *Tooling*, which is packaged as the "Banking Transformation Workbench" and uses the powerful development tool portfolio from IBM
- *Accelerators* that help to jump-start the transformation project and save time
- *Architectural blueprint*, which is based on state-of-the-art design principles and technology standards
- *Enterprise integration platform*, which provides powerful middleware to run core banking applications
- Up-to-the-task and *workload optimized* infrastructure components

Vision

Banks often experience pain points while growing or remaining competitive because of inhibitors in the core banking IT environment. IBM's vision is that these banks start investigating possibilities to transform to their IT environment. They must look for ways that provide a better time to market, better reuse of application components and data, lower maintenance cost and overall less risk to operate and maintain.

A core banking transformation effort can be complex and costly, which is why it must be planned out carefully. The core banking transformation methodology of IBM leads to creating a *roadmap* as one of the first deliverables. The roadmap defines the steps to take, how long they will take, and the sequence in which they must be performed.

Another corner stones of IBM's vision is for banks to be able to make a fast start and be productive on day one of the transformation. Many core banking transformations are alike. Therefore, a great opportunity exists to use reference architectures and reusable assets as much as possible. The IBM *core banking transformation framework (CBTF)* provides these starting points.

Finally, IBM's vision is that a transformation effort is ideally completed in a *progressive* and *iterative* manner. A "big bang" replacement scenario might be an option only in limited cases. In most cases, an iterative approach has less risk and provides "day one functionality" faster.

IBM's point of view is to perform a core banking systems transformation in a progressive manner, step by step, and guided by a roadmap, that leads to the desired end state.

Methodology

IBM's core banking transformation solution defines a comprehensive methodology that aligns business and IT, and uses IBM business architecture assets and industry models. This solution also integrates bottom-up analysis and discovery with top-down business driven transformation.

This methodology is based on IBM's experience with complex service-oriented architecture (SOA) projects and banking transformation engagements. It is a meet-in-the-middle approach that uses both top-down and bottom-up threads. It also uses best practices and industry standards to greatly accelerate the top down approach.

Tooling

The transformation methodology is supported by the *Banking Transformation Workbench*. Banking Transformation Workbench is an integrated tools environment from IBM that implements solution templates as part of a core transformation project. Banking Transformation Workbench further integrates the framework methodology and assets with IBM development and modeling tools from the IBM WebSphere® and Rational® brands. The framework methodology and assets are integrated all on a collaborative integrated solution development platform designed for core banking.

Banking Transformation Workbench enables engagement governance through tasks, work items, and artifact management. It also provides method and assets guidance to enable task-oriented development and automation and assists in creating and transforming engagement artifacts. Banking Transformation Workbench is a comprehensive, all-in-one tool that provides a multitude of core banking transformation capability patterns. It enables a model-driven development approach that semi-automatically derives and transforms SOA runtime artifacts from business models.

Accelerators

Solution templates are another part of the core banking transformation solution from IBM. These templates are prebuilt accelerators to jump-start the implementation. They are developed through customer engagements and harvested, formalized and generalized to a set of reusable industry software components. Templates are essentially industry software with configurable business processes, business rules and data models. These templates are used throughout the application development lifecycle and greatly accelerate time to market.

Architectural blueprint

The heart of the "to be" core banking systems architecture is an enterprise integration layer. This layer is built on open standards to support a multitude of integration patterns. Such patterns include process choreography, service mediation and content-based routing, service registry, business rule execution and traditional or application adapters.

The IBM architecture is based on the following design principles:

► SOA helps to decompose the problem space into a set of loosely coupled service components that integrate through a service bus. This principle provides a new approach to support the agility and flexibility that business demands, in building new core banking applications or renovating existing applications.

► By using SOA as a set of architectural principles with Model Driven Development, IT can build applications that use rich industry models and derive solutions that align with business goals.

► Traditional environments often contain multiple sources of master data. Key advances in master data management (MDM) enable IT to consolidate the master data into a central repository for a 360-degree view of customers, products and accounts. This data can be exposed to enterprise-wide applications and business process through a service bus.

► Business process management (BPM) elevates business processes with their modeling, development and execution from the siloed application-centric approach to a common set of service components that can be choreographed externally for flexibility.

► Advances in business rules management (BRM) centralize management and governance and free them from the application providers. They reinforce the agility that business needs to expand to new markets or to optimize operations.

► Although SOA, MDM, BPM and BRM provide the architecture, modeling, development, execution and monitoring, the key solution ingredient of earlier analysis and discovery is still needed. By using these technologies, banks can browse millions of lines of established code and identify pieces of business logic and rules that can then be elevated into the middle tier. In addition, IT can develop business processes that span across applications such as cross-line-of-business (LOB) product bundling, cross-sell and up-sell, and customer-centric pricing.

Enterprise integration platform

The architectural blueprint is facilitated by a runtime platform that is derived from the rich portfolio of market-leading SOA software. A key component of the runtime platform is the IBM InfoSphere® MDM server. Many core banking transformation projects begin by consolidating customer data. The MDM server provides an integrated view of customer data and exposes it as services on the enterprise service bus (ESB). The MDM server also provides consolidation of product and contract information and makes it available through a services interface to the enterprise-wide business processes.

The integration also contains IBM WebSphere BPM Server, which provides dynamic, componentized, model-driven business process orchestration with WebSphere Enterprise Service Bus or WebSphere Message Broker. These two technologies provide service mediation and data mediation that integrate with earlier applications.

Additional integration components are the IBM WebSphere ILOG® business rules engine. This engine externalizes the business rules development, management and execution, and IBM WebSphere Business Events that support the detailed event processing that is required in a complex integration pattern.

Overall, the integration framework provides a robust IT service management with IBM Tivoli® software that is supported by IBM hardware and operating systems. Together they provide scalable and high performance computing environments that support

high volume transaction processing and flexible business process execution.

Fit-for-Purpose infrastructure

A modern core banking systems environment consists of many pieces that require different qualities of service. Such an environment includes core transactions, analytics and reporting queries, batch processing jobs, business rules and workflow components, among others. Many of these components can be subject to sudden workload spikes, which is especially true in our world of economic volatility and the increasing use of mobile devices.

When embarking on a core banking systems modernization, placement of these components must be carefully designed. Considerations must be given to end-to-end service levels and flexibility in the future with respect to possible deployment of parts of the environment to a cloud.

IBM's point of view is that the chosen infrastructure topology will determine how SLAs will be met and to the extent that overall solution will be successful. Start looking at the infrastructure aspects early in the transformation project.

By using the core banking transformation roadmap and an architectural blueprint of the future core banking systems environment, a "fit for purpose" study can be performed. This study determines on which platform each architectural construct, such as the following generic types, fits best:

► Multichannel integration

   This construct includes the user interface components of core banking systems, but is implemented in a common middleware optimized for user interaction on multiple devices.

► Business process management (BPM)

   The BPM layer is a common run time that runs business processes that involve services from multiple back-end applications.

► Service registry

   The service registry is also a common run time that is used by all service requests throughout the entire core banking application landscape.

► Business rules

   One of the focus areas in the transformation is to implement business rules under a "business rules management system," instead of embedding them in procedural code. This business rules layer is also a common construct shared between multiple core banking applications.

► Analytics middleware

   This construct is a set of middleware used for all core banking operations. At a minimum, it consists of a business data warehouse, a business intelligence environment for reporting and an analytics environment for statistics and predictions.

► ESB and other connectivity infrastructure

   This shared middleware construct entails the entire communication infrastructure that is used between services in the core banking systems and between the core banking systems and other systems within a bank. This construct can have a combination of different levels of communication technology:

   – ESB, applying SOA-style functionality to integration

   – WebSphere MQ, for message-oriented integration

   – Remote Procedure Call (RPC)-style connectors

► Master data management server

   As explained earlier, one of the higher priorities in core banking transformation is to implement master data management. The MDM server is also a common middleware construct shared between all core banking systems.

► Core banking services

   Core banking services are the core banking transactions that result in database updates. These services are organized per product or product type. They encapsulate business logic and business rules and have access to operational data. The technology used for these core banking services can vary and they do not have to use the same programming language, database or transaction manager. However, it is best to implement functions as componentized services.

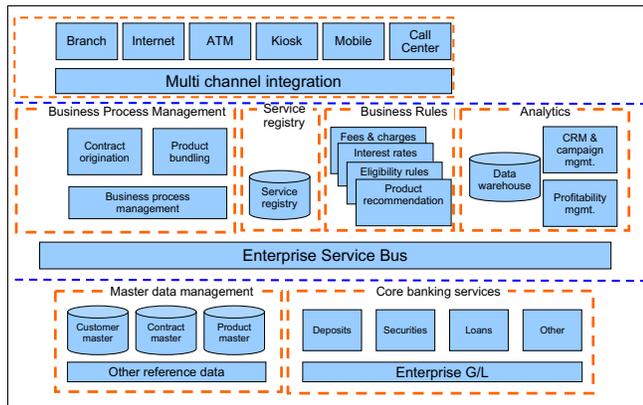Figure 3 shows these constructs and how they relate to business functions.

Figure 3   Core banking systems components

After finalizing a blueprint, similar to the one shown in Figure 3, and the nonfunctional requirements, banks should follow a structured infrastructure design methodology to determine the required infrastructure.

Choosing a platform

Many banks currently rely on IBM mainframes to run their core banking transactions and host their core banking data. They consider the IBM mainframe the best choice for running core banking transactions, from a scalability, availability, reliability, integrity and security point of view.

Many banks consider the IBM mainframe the best platform to run core banking transactions, from a scalability, availability, reliability, integrity and security point of view.

The IBM solution for core banking provides for an architecture in which existing core banking transactions can be kept on the IBM mainframe. Meanwhile the additional layers for BPM, ESB, MDM and BRM can be placed on any platform that can meet the nonfunctional requirements for each of these constructs. This way, the transactions that are close to the data and that need a high level of integrity benefit from the supreme qualities of services of the mainframe.

Core banking transactions that run on the mainframe can be seamlessly integrated with the rest of the

architecture as componentized services by using middleware and connectors.

The latest generation of IBM mainframe, IBM zEnterprise®, offers a hybrid computing environment that facilitates "Fit for Purpose" placement of all constructs within a core banking systems architecture.

Benefits of a core banking transformation

Banks that have modernized their core banking systems have seen dramatic improvements in their overall operations and profitability. This type of transformation includes the following benefits among others:

► Improved time-to-market for new products and services

► Implemented product bundling and relationship pricing

► Decreased business as usual expenses

► Reduced operating expenses

► Entered new markets quickly

► Accelerated project delivery

► Increased productivity

► Reduced testing effort

► Reduced time-to-market

► Reduced costs by consolidation

► Reduced costs by outsourcing

► Improved quality

► Improved decision making and saved costs by applying a process

► Improved customer retention and implemented relationship pricing using a single customer view

Next steps: IBM can help

If your business is feeling the pain points of an inflexible core banking systems environment, start looking at the options to transition to a modernized environment encapsulating all the benefits explained in this POV. By using a combination of business architecture, IT architecture and frameworks, productive development software, performing hardware and a structured methodology you have all the ingredients to become successful.

For more perspectives on this topic, consult the following additional resources:

- ▶ IBM Banking Center of Excellence

  http://www.ibm.com/systems/services/bankingcoe

- ▶ Landing page for IBM core banking transformation solutions:

  http://www.ibm.com/software/industry/banking/transformation.html

- ▶ Banking Industry Framework (of which core banking transformation is a part):

  http://www.ibm.com/software/industry/banking/framework/index.html

- ▶ Brochure on the IBM Banking Industry Framework:

  ftp://public.dhe.ibm.com/software/industries/frameworks/pdf/BZD03001_BANKING.pdf

- ▶ Announcement on IBM Banking Industry Framework:

  http://www.ibm.com/press/us/en/pressrelease/28401.wss

- ▶ IBM Redpaper™ *Case Study: SOA Banking Business Pattern*, REDP-4467

  http://www.redbooks.ibm.com/abstracts/redp4467.html

- ▶ Video on the Banking Transformation Workbench:

  http://www.ibm.com/common/ssi/cgi-bin/ssialias?infotype=SA&subtype=PS&appname=SWGE_BZ_CZ_USEN&htmlfid=BZV03001USEN&attachment=BZV03001USEN.WMV

- ▶ Landing page for solutions for banking on IBM System z®:

  http://www.ibm.com/systems/z/solutions/banking.html

- ▶ White paper *Managing 21st Century Business and Technology Innovation: Core Banking Transformation with System z*, ZSW03011USEN:

  http://public.dhe.ibm.com/common/ssi/ecm/en/zsw03011usen/ZSW03011USEN.PDF

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