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Empirical Study on Digital Core-Banking System

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Abstract

In the last few years, banks have experienced more challenging market than any other times. They need to find new ways to reconnect with their customers and rebuild their trust. But in the race to the future some banks are taking clear lead. Research works show that while high perform leading banks are different, they also share some common characteristics and principles that have allowed them to move ahead to profitable growth. Cost cutting is no longer enough to succeed in tomorrow's world. Instead, the IT function needs to work shoulder-to-shoulder with the business to support the growth agenda. Therefore "C" level's attention is moving from cost reduction towards customer experience, speeding to market for new offerings, analytics and distribution channel enhancements, taking advantage of several levers that will shape the technology agenda for the high performing organization. Next generation of digital core-banking solutions will improve pre-existing capabilities, introduce new innovations and drive qualities such as flexibility and scalability to support time to market.

Keywords: *Digital Core-Banking System, Customer-centric, Cutting-edge Technology*

1. Introduction

Core banking has historically meant the critical systems that provide the basic account management features and information about customers and account holdings. It is a system that directly handles financial transactions such as deposit, loan and credit processing capabilities, foreign exchange transactions with interfaces to general ledger systems & reporting tools, and is generally referred as an back office system or universal banking system. This core banking is the core of the bank's enterprise information system, it has been used as an alternative to overcome the limitations of complex banking business such as insufficient internal control structure of financial institutes, lack of awareness of customer service, grouped and bureaucratic organization, inefficient cost structure.

Core banking systems support a full spectrum of capabilities including customer relationship

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management, administrative services, banking services, financial accounting, lending, reporting, risk management, compliance, trade finance, correspondent services, multi-channel support and payments.

However, the legacy core banking is a system designed primarily for stability, security, and redundancy rather than agility to support the market where changes are rapidly taking place.

In segmented markets, many customers are well advanced to adapt mobile and Internet use, but banks can't catch up the demands of this change, banks are losing customers, running the risk of losing profitability, even though existing core banking system hampers bank innovation.

In other words, it is not enough to have a core banking system that emphasizes stability, security and redundancy . The system should be flexible and agile to maximize profits in response to market changes and customer demands.

2. Legacy Core Banking System

Core banking system's key roles are decreasing non-profitable assets with effective asset management, increasing commission income by providing various services, exchanging of various information with customers, shortening product development and time-to-market, maximizing customer satisfaction through customer consultation or shorter transaction time and higher return of investment(ROI).

From the view point that the system should be structured in order to adapt to the rapidly changing environment and to satisfy customer needs, the problems of legacy core banking system model are summarized as follows;

2.1. Product Centric architecture for business plan supporting

Legacy Core Banking System(CBS) were architected for security, redundancy and reliability of product-centric business plans. This core banking is the core of the bank's enterprise information system, also domestic banks have built a next generation system(NGS) for more than 10 years from early 2000s to early 2010s, which contributed greatly to resolving most of the problems which most banks were required at the time. It has core functions such as more customer-oriented, product-oriented, function-oriented, user-centered, fast development of new products than prior system and 24x365 support system.

But NGS has a product-centric core banking structure for the business plan support purpose. As such, is relatively weak the release of new innovative products with quick and flexible and customer-centric aspect. To be customer-centric requires the flexibility of applications that work with core banking systems.

If banks are not able to provide services or information to customers from a global perspective due to vulnerable data on accounts, sub-accounts, products or customer contributions affected by market changes, they may not be able to provide customers with proper products. In addition, loss of opportunity due to inappropriate product offers and contracts may lead to revenue leakage.

According to banking industry analysts, the total cost of this problem to the financial services sector is up to $103.7 million annually in lost revenue.

2.2. Lack of transparent price policy and billing system

In today's faster moving world, legacy core systems have little flexibility and agility, so banks have to work harder to deliver more and better value to their customers. It's not enough to meet business demand changes.

Core banking systems which were architected based on product centric viewpoints for slower world constrain what banks could do with a global view of the entire customer relationship.

As business demands change, so must core architecture. By showing the value of the relationship via global view of the customer account, banks cultivate unique, customized, individualized pricing for each customer's accounts and services. Customers are seen as customers, not products. Product Centric architecture is just for business plan supporting.

2.3. Absence of ability to provide transparent and rapid reports for customer trust

In the past, there was no demand for flexibility and agility in core banking systems, but recent rapid changes in the environment are causing competition, requiring banks to make efforts to survive providing more value to customers.

The legacy core banking system has the following positive characteristics to meet the changes.

First, it facilitates the development of the next system through the reuse of the standardized package type business module.

Second, it is possible to implement a low total cost of ownership(TCO)because it is composed of a 'call' structure system in which no duplication module occurs.

Third, it allows modification, change, and replacement of modules, thus ensuring flexibility in system development and maintenance.

Fourth, it contributes to the reduction of the development cost because system development time and time are shortened.

But corporate banking relationships are inherently complex. Multiple entities, geographies, currencies, languages, jurisdictions with different regulations, and multiple taxes, sometimes even multiple recipients and the level of accuracy directly correlates to the robustness of the revenue stream. When a bank lacks this level of billing functionality and sophistication, they have to create bills manually. Manual billing is costly and is the hidden bane of many current banks. When billing and pricing are not automated with systematic checks in place, those processes come at a burdensome cost.

A recent report by Tower Group noted that more than 60% of corporate banking customers would consider switching bank due to lack of billing and pricing transparency. Standard core banking systems do not offer functionality to the necessary degree.

2.4. Slow Time-to-Market to keep stability, security, and redundancy

Mobile or Internet-savvy individual or corporate customers form a fragmented market, and financial institutions must face the risk of loss of customers and profitability if they do not meet changing needs.

If legacy core banking systems are an impediment to innovation, it will not respond to market demands in a timely manner. That is, it is a slow time to market. Even if a bank produces a perfect product, it would be pointless if it can't present a differentiated strategy timely & properly for each target customer.

Legacy core banking systems is developed in programming languages such as COBOL, C, and C ++, which can't support adding and applying new products to the bank lineup in a timely manner. Also, whenever system is upgraded with a new module using this language code, the bank architecture becomes complex every time, resulting in customer account transactions not integrated.

Banks who want to augment their core systems with a truly flexible, innovative and agile solution are to

choose one with 100% Java architecture. Banks with an eye on longevity and profitability are to base on their pricing and billing initiatives on solutions that can handle the complex multiple transactions and regulatory environment unique to the financial services industry.

Java is a very popular language for developing enterprise applications, but it is not well utilized in the financial sector. The existing bank's IT system is mainly developed in COBOL or C language, mainly because the mainframe application was developed in COBOL and was downsized as it moved to UNIX.

Table 1 is an analysis of the major challenges financial institute face with core banking system.

Table 1. Digital core banking platform structure

Challenges	%
Cost of responding to regulatory Pressures	35%
Th cost of maintaining legacy system	29%
Complexity of integrating with other system	29%
Cost of product development	28%
Scalability of system to support growth	26%
Improving the customer experience	26%

3. Digital Core Banking

As most corporate environments are digitized, the business environment of financial institutes is also rapidly changing. The number of off-line customers looking for branches has decreased significantly and financial transactions using call centers and automation devices have also been declining. On the other hand, financial transactions through internet, mobile banking are increasing rapidly. Mobile banking using smart phones has overtaken Internet banking as of the number of transactions.

Therefore, the following should be included in the architecture design of the digital core banking system that adapts to global environment changes and accommodates and responds to various customer needs.

3.1. Function and feature of digital core banking platform

Digitalization is fundamentally a reorganization of the financial institution and a structural change of the bank. Digital banking is providing customers with services suitable for the digital world and providing new and strategic functions to banks. Therefore, banks should focus on building close customer relationships by getting closer to customers. Digital core banking systems should provide the following roles.

3.1.1 Maximizing customer profit

It is able to contribute to maximizing customer profits by providing information of updated rate and price in real time base**.**

3.1.2 Providing personalized advice and suggestions to customers

Banks should be able to provide personalized advice and professional suggestions to let customers achieve personal goals.

3.1.3 Providing a variety of financial services to customers

The customer must be able to interconnect with various partners and to provide financial services .

3.1.4 Contributing to increase efficiency of internal work process

Should enable to minimize new product time-to-market and to release new attractive products with services. Technological advancement of information providing system should be implemented to analyze large capacity information and establish strategy at low cost. Cutting-edge technology adapted information system is implemented to analyze large capacity information and establish strategy at low cost. To generate new income from existing customers, additional system should be implemented enabling to convert free service to chargable.

3.1.5 Cost Reduction

Continually strive to reduce back office work and minimize complex interconnected applications.

3.1.6 Increase redundancy and scalablity

When digital transactions and real-time processing increases, the scalablity and redundancy must be guaranteed.

3.1.7 Applying the current technology

Clould computing and Big Data technologies must be integrated and processed quickly and easily with the existing Application Program Interface(API) layer without adding additional layers or costs.

Figure 1. shows the meta-frame structure of the digital core banking platform

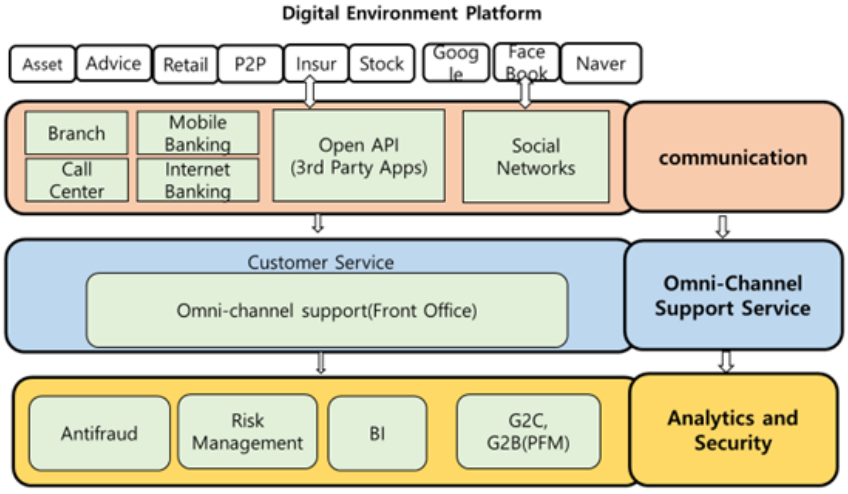

Figure 1 Digital core banking platform structure

3.2. Technology and Strategies for Financial Institute

3.2.1 Consumer-centric service strategy

Financial institutes should transform everything including its operating model, its processes and the way it sells products to customers. First of all, Digital Banking means customer convenience and customer centricity.

The new generation wants to receive services not only simply fast, but also remotely through digital channels without any extra efforts; a new generation customer does not want to simply have a choice, but a horizon of opportunities. In order to respond to this demand, it becomes very important to combine technologies with customer requirements of what they expect to receive from the bank.

Is required the attitude and ability to quickly identify changes and respond appropriately to financial

consumer needs, and the priority should be the value chain of financial consumers.

Therefore, financial institutes should pursue a strategy of participating in consumers' financial activities and creating profits as a result.

Banks should be flexible in their dealings with customers, be willing to go beyond standard procedures, be knowledgeable about products and services and give customers the feeling that what they receive is unique.

To do this, financial institutes must pay attention to social listening because the customers' opinions spread rapidly through social networks in the digital economy era, such as KakaoTalk, Twitter and Facebook.

It becomes an important competitiveness for financial companies to be able to listen to the customer's voice with the viewpoint of the outsider and analyze their financial needs in real time and quickly reflect to product planning and marketing campaigns. Consumer experience becomes the paramount driver of new products, services and marketing.

3.2.2 Collaborate on enterprise information analysis and experts experience

Flexible and efficient support of IT systems is a prerequisite. We need an open innovation approach to share costs, risks and performance while driving innovation with external partners. Because companies can't have all the skills, knowledge and expertise needed for innovation, they need to leverage external experts.

As the digital environment evolves, financial institutions must innovate in such a way that they collaborate with outside experts. Innovation can be thought as anything new that adds some type of value to the bank or its customers. Rather than a "nice to have", innovation has become a core business capability.

And half of global banking executives say they believe that social media will help accelerate innovation of products and services. Successful organizations tend to be more open and embrace innovation, encouraging participation and co-creation from customers and partners. Social technologies provide a key means to promote this type of participation and engagement.

3.2.3 Business Analytics Strategy Required

Financial institutes have been already conducting various analysis such as credit analysis for credit screening, recommendation analysis for presenting appropriate deposit items and fraudulent transaction analysis for identifying and preventing abnormal transactions. Customer contact logs, social and customer location data have become more diverse.

One of the success factors of digital banking is how well it can perform financial processes in a digital environment without human intervention. As the analysis becomes more sophisticated, there is a greater possibility of catching the potential customers who have been excluded in providing financial services in the past.

Robust predictive analytics based on big data are necessary for banks to deliver such experiences and half of global banking executives indicated investment in predictive analytics is a key priority.

Cognitive computing, in particular, will enable banks to deepen and scale workforce capabilities, as well as support the creation of compelling experiences for mass markets that were once only the purview of the very rich.

Through its ability to instantly proceed and contextualize massive amounts of data and information, cognitive computing will enable a profound transformation of banking processes and relationships.

3.2.4 Network Business Model Strategy

Networked business models mean opening up a platform so that third parties can develop innovative new services on top of the platform significantly creating new value.

Financial institutes have a large number of customers and a high level of customer loyalty, so they have a prerequisite to implementing a networked business model. Therefore, by planning and operating financial products that actively reflect customer opinions, we can increase the financial product suitability by increasing the number of participating customers.

The legacy banking system model handles the deposit customers and loan customer on separate networks or layers, which can't support integrated customer management. While two-sided market will be created if banks can connect the credit customers with deposit customers on the same network. A customer who wants to borrow money pays a commission to the bank to find the person to lend, and the money depositing customer pays the bank a commission to find the person to borrow the money. As the customer network to borrow money grows, so does the depositing customer network. It is pretty clear two interconnected networks are synergistic. Peer to peer loans are the business model that maximizes the network linkage effect.

Vital for digital banks will be the full integration and digitization of back-office processes, as well as the elimination of redundant interfaces to reduce operating costs and increase the business agility. It will also be essential to cultivate strong banking capabilities to reap the benefits from low-cost products and services.

The execution of the digital bank business model might require significant upfront investment for the transformation or buildup of the system infrastructure. Since market developments in the digital world occur rapidly and companies can become no-names in the blink of an eye, it is important for any bank to integrate the latest technology and anticipate market trends. Hence, the development of products and the ecosystem needs to be flexible but standardized.

Table 2 shows the results obtained by financial institutes applying the concept of digital core banking platform.

Table 2. Major business benefits of digital core banking system

Benefits	%
New product/innovation	53%
Internal process improvement	49%
Improved customer experience	48%
Improved agility to respond to business needs	48%
On- going cost and maintenance	46%
Overall financial return on investment	46%
Improved Functionality	45%

4. Successful Overseas Cases and Success Factors

4.1 Analysis of Overseas Bank Trends

In the last few years banks have experienced a more challenging market with lower economic growth, increasing uncertainties and drastically reduced customer loyalty, financial institute concentrated in not only

focusing on cost management, but also improving their relationships with customers to increase profitability in core businesses and value for shareholders. Leading successful banks have focused on their customers and have been seeking to improve efficiency and grow through investing on technology. World leading banks are also experiencing the same low economic growth, rapid changes of regulations, increased funding and balance requirements, steadily decreasing loyalty customers and adoption requirement of new and emerging technologies.

Financial industry consulting agencies propose distinctive and diverse countermeasures to solve the problems. In other words, banks need actions of products and services development, new customer development and maintenance, optimization of product prices, effective risk management, acquisition of M&A opportunities, to refocus on core businesses other than cost cutting effects they had focused. Also they need to rebuild profitability and reboot shareholder value through a combination of actions and strategically reduce costs across their business model; develop customer-centricity to attract and retain customers and relaunch growth; effectively manage risks and optimise funding and pricing.

4.2 World leading banks' success factors

Leading global banks that are successfully operating in uncertain economic conditions and difficult business environments have created new contacts with customers, built a framework of trust and made efforts to grow with common characteristics and principles. The success factors that successful banks have applied in common can be summarized as follows.

First, high performing organizations pivot around customer segment management rather than product management, ensuring strong connections between different lines of business.

Their relationship model, Customer-Centric Core Banking Model, takes a holistic approach to customer needs in order to build prime provider relationships.

Product offerings are based not only on client segments but are also specifically tailored to specific customer profiles/needs, while the sales force is supported by advanced CRM tools. These banks also deploy sophisticated pricing models based on customer lifetime value and behavior profiles (risk, channel, propensities), and a fee model linked to the value added services customers are willing to pay for. Finally, they have configured their sales and service approach with simplicity, convenience and transparency as the key guiding principles.

Second, applying a new smart device and technology, they applied Multichannel Distribution Model which guarantees continuous service through various contact channel with customers. Also they invests in data capture, management and analytics capabilities to multiply their number of interactions per customer, achieves more seamless and personalized customer experience, sells multiple products during each sales interaction for better sales ratio and provide ubiquitous access through an optimized channel mix and cost-efficiently.

Third, they have been early adopters of industrialized operating models in order to deliver best in class operating balanced with excellent customer service with implementing “three layer operating model” for retail and commercial back office; 1) Strategic functions are retained at bank (5 percent), high value activities are also kept internally and 2) performed sometimes by a segregated subsidiary (20-30percent), 3) while the rest of non-core functions (up to 60-70 percent of total) are outsourced to strategic partners.

Depending on the starting point, these initiatives are expected to deliver 30~40 percent or more in savings during a 10-year time frame.

Fourth, high performers have applied prudent risk management policies to ensure low bad-debt ratios, strong coverage for provisioning, along with low reputational and operational risk. Also high performers separate risk functions from lines of business while maintaining strong governance to coordinate risk and the business Furthermore, they segregate risk underwriting circuits by business segment (retail, commercial), pursuing business process optimization.

Fifth, robust capital management discipline is a key pillar for high performers, combining high quality capital, appropriate liquidity and funding positions, with a proven successful track record of inorganic growth.

Sixth, the success of the Cutting-edge Core Banking model has been demonstrated by the ability to export or replicate the model to global markets. They have gradually evolved from a single geography to a multi-local operating model. they have deployed a standard and scalable IT model, based on global IT governance, global hardware infrastructure, regional software factory hubs, regional IT retail banking platforms and global platforms for treasury and some wholesale and global retail lines of business.

Seventh, technology is a crucial building block supporting the successful Core Banking customer centric model. they shaped a generation of highly automated, scalable and flexible customer centric core banking platforms which support customer centric, business process oriented and anytime any where service.

This core banking platform features customer-centric, business process-oriented, 24x7 support with various communications channels, best real-time processing, lean process without overlapping processing, scalablity for environment changes, exch country's currency, language, business unit, etc.

Table 3. Identified seven key elements that propel high-performance

	Success Factors
1	A customer-centric universal banking model to build deep relationships with core customer groups
2	A multichannel distribution model that delivers consistent and seamless service across channels
3	An industrialized operating model that supports cost efficiency and customer service
4	Prudent risk management policies that minimize bad debt, and reputational and operational risks
5	Robust capital management built on high-quality capital and inorganic growth
6	An ability to replicate models in developed and developing markets
7	A cutting-edge core banking platform

4. Conclusion

Banks are always on the lookout for new challenges to survive in an era of constant and rapid changes in the business environment and to deliver top performance for stakeholders. Both organizational structures and technological infrastructure are all important. I have proposed a digital core banking platform as one of the ways to overcome these problems and maximize business profit.

In order to succeed in the transition to the digital core banking platform, a top-down approach is required from top management to staffs in charge.

In addition, the successful transition can be achieved by closely cooperating and consulting between the Chief Information Officer (CIO) & its technical organization and business departments to turn to the organization for growth and customer satisfaction.

To make it work, all of the above will have to be supported by the new technology wave that is rapidly reshaping the way businesses and customers interact and deploy technology.

Digital core banking will be shaped around trends like cloud computing, service-centric architecture, IT security and data privacy, user experience, social platforms or data accessibility and analytics.

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