SAP Thought Leadership Paper
In-Memory Computing

In-Memory Computing for Customer-Centric and Transactional Banking

Creating a Holistic View of Customers for Timely, Innovative Offerings

The Best-Run Businesses Run SAP™

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To gain a full understanding of your customers and create the exceptional banking products and service that foster loyalty and long-term relationships, you need information that is timely, reliable, and robust. From a common database, in-memory computing helps you rapidly process massive amounts of customer-centric and transactional banking data. You get the information you need to make real-time or near-real-time business decisions, minimize customer turnover, detect fraud, and prevent money laundering.

Technology Brings Challenges and Opportunities for Banks

Enhancing long-term customer value tops the agenda for every bank executive today. In mature markets, especially in times of intense competition, banks must make each customer relationship as profitable as possible. To achieve business growth through increased customer loyalty, they need a strong understanding of customer preferences and banking habits.

This knowledge is especially important at a time when a bank's competition offers the same or similar products, thus eliminating a key market differentiator and making it easier for customers to change institutions. With the right information, banks can more effectively meet new customer expectations, including expectations for highly personalized service, and achieve profitable long-term relationships with their customers.

MULTIPLE SYSTEMS GIVE WAY TO A CONSOLIDATED LANDSCAPE

Chained to outdated IT architectures, many banks find it hard to capitalize on these new realities of examining customer lifetime value. All too often, a patchwork quilt of systems and applications blocks the holistic view of customers needed to create and deploy new offerings.

This is partly due to the fact that applications for **customer-centric banking** processes (marketing, sales, and service) and **transactional banking** processes (deposits, loans, investment, collateral, and payments) have increased significantly in recent years. These applications use different technologies and databases from different vendors. In addition, the next layer of applications, data, and processes for customer-centric banking are often separated from those for transactional banking.

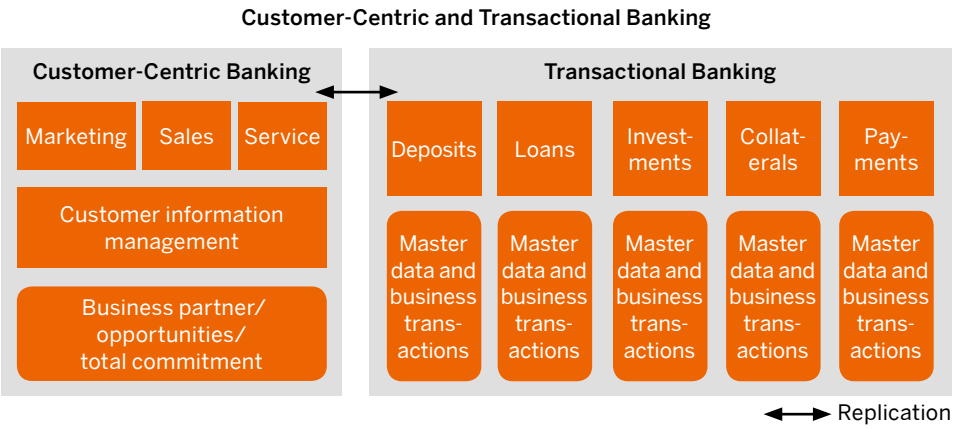
Usually, there's a single repository on the customer-centric side that handles all customer-related data. For transactional banking, there are usually silos of applications for individual products or organizational units or both (see Figure 1). This heterogeneous landscape must be adapted to integrate data, analyze it holistically, and create a unified profile of individual customers and groups of customers.

Such integration generally requires a complex infrastructure for data replication that can involve several data marts – or even several data warehouses – and adjacent extract, transform, and load (ETL) systems. Most banks find that it is very costly and time-consuming to normalize data into a single format for calculations and other analysis. To maximize system performance, the sourced information is often stripped down or aggregated. Even state-of-the-art technology with service-oriented architecture can require this data replication.

Distributed systems can present a huge impediment for banks' marketing campaigns. To be effective, marketing campaigns must target customers with the right products at the right time. To prevent defections, banks must quickly identify patterns of customers willing to terminate their banking relationships. In distributed systems, this information gets lost in a massive amount of data or features – making it difficult to analyze past customer behavior or predict future behavior. At a time when reducing cost is key to profitable customer relationships, these outdated systems have also become very expensive to maintain.

Recognizing these problems, many banks have made the consolidation of banking software a top priority. They know that such consolidation is vital to optimizing business processes and reducing costs. They also recognize the need to stay on top of regulatory requirements that have become increasingly numerous and complex.

Figure 1: Typical Architecture Pattern for Customer-Centric and Transactional Banking Today



MOBILITY AND SOCIAL NETWORKING CHANGE THE GAME

Real-time access to banking services and products via mobile devices – and to the market response to these offerings via social networking – is creating a new level of customer expectations. At a minimum, customers expect to access their accounts and pay bills via mobile devices. They also expect banks to respond immediately to their complaints and inquiries.

To stay in the game, banks must also offer innovative services and products – such as forecasts of customer payments as well as real-time tracking of payments and other customer actions by specific location. Today, flexibility and a quick time to market for such innovations offer an important competitive advantage.

In addition to increasing customer expectations, technology has given banks a new source of information about their customers' habits and opinions via social networking. By carefully mining this information, you can easily spot new market trends and opportunities.

CUSTOMER-CENTRIC AND TRANSACTIONAL BANKING COME TOGETHER

To provide the specific products and services each customer wants, a holistic view of the customer is necessary. This view can only be achieved by integrating all relevant data – from both customer-centric and transactional banking applications. A deposit application for transactional banking may need detailed information about the bank's business partners that is stored in customer-centric banking applications, for example.

Siloed transactional banking applications must also exchange data among themselves. Covering a secured loan, for example, requires interaction and data exchange between loans and collateral applications.

The massive data exchange needed – both among the siloed transactional banking applications and between customer-centric and transactional banking applications – can jeopardize data integrity, make reconciliation hard to manage, cause delays, and add cost. It may also make it difficult for banks to provide suitable services, products, or marketing campaigns to their customers at the right time.

There are operational consequences as well. Banks face competing objectives in end-of-day (EOD) processing. When applications are siloed or otherwise separated, EOD processing involves transactions for a defined period (workday, month, or quarter) for tasks such as creating and reporting daily balances. While EOD processing should start as late in the day as possible for maximum business flexibility, it should end as early as possible to provide daily balances and start the extensive data exchange among applications. Faster processing of data can help to satisfy these competing objectives.

IN-MEMORY COMPUTING GIVES BANKS REAL-TIME CUSTOMER INSIGHTS

Banks can make the most of today's market opportunities with innovative technology for in-memory computing that offers deep, real-time insight into their customers. This technology makes it possible to analyze massive quantities of data in local memory. By providing the results of complex analyses and transactions in real time, it helps banks make responsive, even proactive, business decisions. New approaches to table structures and analysis support higher data volumes and faster analysis than was previously possible.

Up to 3,600 times faster than standard analytical computing, in-memory computing also fosters highly granular insight into data, streamlines the management of large volumes of data, and reduces IT complexity. Regulatory reporting and real-time business decisions are based on reliable information from a single source of truth, and banks can reduce the cost of operating their analytical systems. The new technology transforms customer data into forward-looking business strategies by combining a real-time, 360-degree view of customers with customer-oriented processes.

Revolutionizing Customer-Centric and Transactional Banking

Supporting customer-centric activities with information from transactional banking applications within a reasonable amount of time requires a specific database that provides a complete overview of a customer's relationship with a bank. In-memory computing technology provides the foundation for this database (see Figure 2).

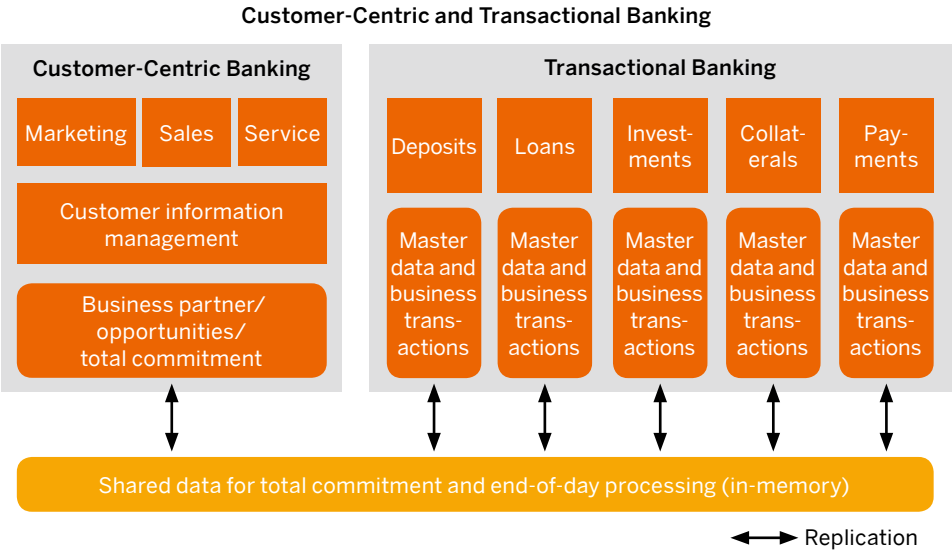
REAL-TIME CUSTOMER ANALYSIS RAISES REVENUE AND PROFITABILITY

As a first step, banks can achieve quick wins using in-memory computing technology in an existing customer-centric and transactional banking system to offer a 360-degree, "total commitment" view of relationships with their most valuable customers. This real-time, holistic view gives sales, service, and marketing processes timely access to customer information held in transactional banking systems.

In-memory computing technology also makes it possible for banks to offer tools that help customers analyze their own financial habits – such as long-term spending behavior – thereby enhancing customer satisfaction, revenue, and profitability.

The technology also helps banks segment real-time data into target customer groups and gives sales and service employees immediate access to this and other information on their mobile devices. Real-time access to multiyear payment transactions helps service employees and sales representatives manage cross-selling and up-selling activities.

Figure 2: First Step in In-Memory Computing



In-memory computing helps you rapidly process massive amounts of customer-centric and transactional banking data.

REAL-TIME ANALYSIS HELPS PREVENT CUSTOMER CHURN

In a second step, banks can use the shared database to build new rules engines and other analytical features that improve decision making and bring the right products to customers at the appropriate time. Real-time, in-memory computing can also help banks simulate patterns of customer churning and identify customers who are about to defect to other institutions – an important move toward proactive banking.

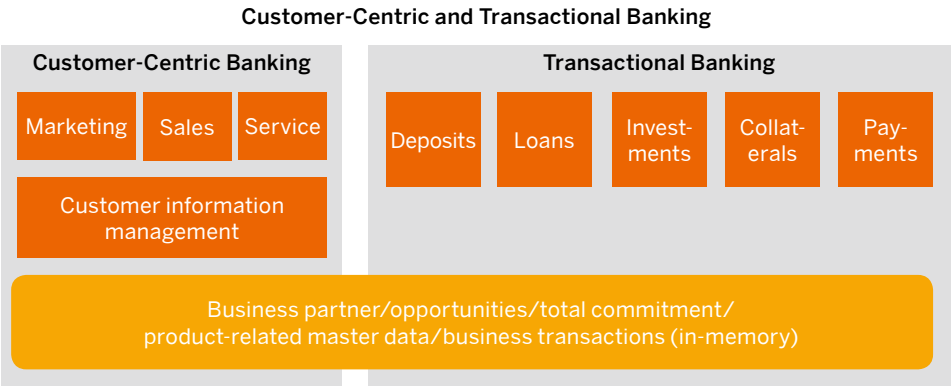
PREVENT MONEY LAUNDERING AND FRAUD IN REAL TIME

As banks update their application infrastructures over time, the step-by-step implementation of in-memory computing will lead to a new banking architecture that integrates customer-centric and transactional banking processes with processes for analytical banking (see Figure 3).

In this scenario, all applications for customer-centric and transactional banking share a common in-memory database. This includes applications that handle information on business partners, new market opportunities, and total customer commitment as well as those that manage product-related master data and business transactions.

With this architecture, data replication among transactional banking applications and between those applications and applications for customer-centric banking will no longer be necessary. EOD processing can be accelerated and will no longer be a limiting factor in overnight processing, providing more flexibility in working hours and availability of services. As a result, banks can identify patterns of fraud and money laundering activities in real time and significantly reduce losses in these areas.

Figure 3: Architecture for Customer-Centric and Transactional Banking with In-Memory Computing in Step 2



Up to 3,600 times faster than standard database technology, in-memory computing fundamentally changes the way banks can use data to create insight and increase performance. Complex queries yield instant insight, helping you stay ahead of the competition.

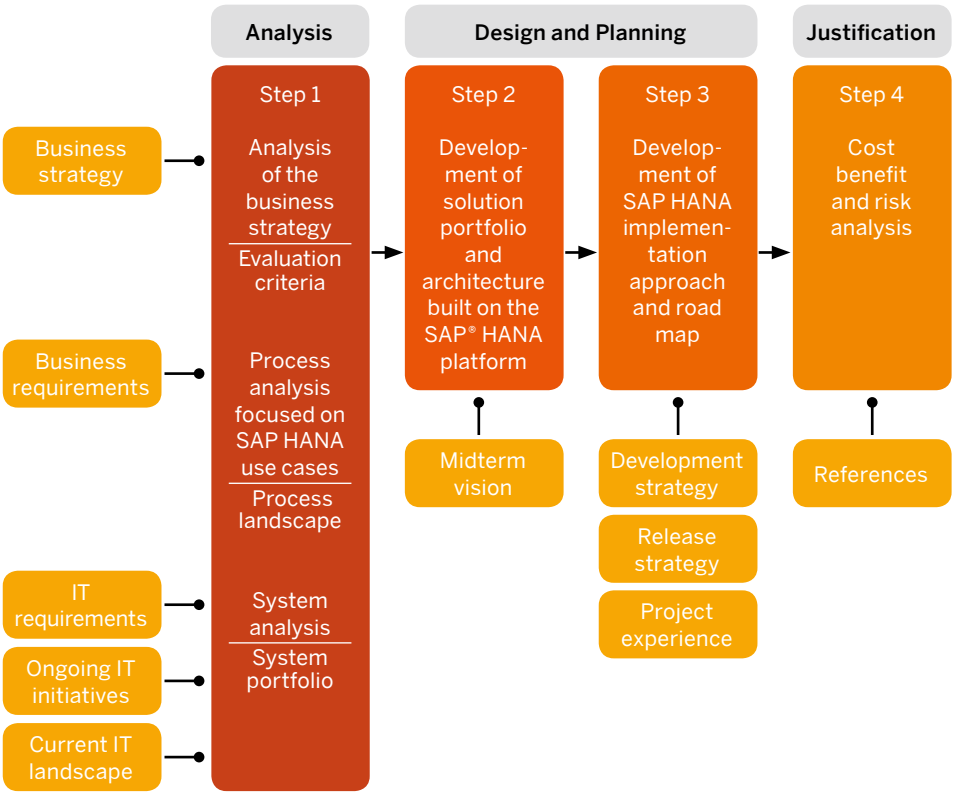
Changing the Game

The in-memory computing technology offered by SAP HANA® appliance software can be a major driver for business and IT transformation in banking. SAP HANA combines an in-memory computing engine with commodity hardware systems that are specifically designed to process real-time data using in-memory technology. Massive quantities of real-time data can be processed in the main memory of a server to provide immediate results from analyses and transactions.

We can also help you get the greatest benefit from in-memory computing – from identifying suitable business and technology scenarios to implementing the software that will help you realize those scenarios. Together we can:

- Discover the areas in your business in which SAP HANA can deliver additional benefits and value
- Develop a target architecture for your business processes and the supporting applications, including SAP HANA
- Derive the best transformation path to integrate SAP HANA into your business
- Execute a business case for using SAP HANA

Figure 4: The Steps of SAP HANA Usage Assessment



FINDING THE RIGHT PATH TO IN-MEMORY COMPUTING

We help you define a road map for each in-memory use case that aligns with your overall business strategy, create a prioritized list of business objectives for in-memory support, and determine how to meet those objectives.

The four steps of this assessment (see Figure 4) answer the following questions:

Step 1: Where can in-memory computing deliver additional benefits and create value?
In the first phase, we help you analyze your current business strategy, processes, and software portfolio and align your business and IT strategies. We also explore business requirements and processes where in-memory computing could best be used.

Step 2: What would a target IT architecture using in-memory computing look like?
We then develop an in-memory-based target application portfolio and the target architecture for both in-memory computing solutions and supplemental solutions. We create high-level prerequisites for the technical infrastructure and its blueprint and help you identify the potential risks, strengths, and weaknesses of the new landscape.

Step 3: Which is the best transformation path to integrate in-memory computing?
In a third phase of the assessment, we define implementation and migration scenarios for the new landscape. We also establish a project framework and master plan that include organization structure and required governance.

Step 4: What are the benefits and risks of implementing SAP HANA and when will the investment pay off?
The last assessment phase weighs your one-time investment and recurring costs against potential tangible and intangible benefits using a return-on-investment calculation and high-level risk analysis.

LEARN MORE

To learn more about the many ways that SAP HANA and in-memory computing can help your institution, contact your SAP representative or visit us online at www.experiencesaphana.com/welcome.

And to learn about the **Business Transformation Services** group of SAP Consulting, visit www12.sap.com/services-and-support/transformation/business.epx.

The in-memory computing technology offered by SAP HANA appliance software can be a major driver for business and IT transformation in banking.

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