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# Core Banking Solutions for Large Banks

## A Global Perspective

This authorized reprint of a Celent report contains material excerpted from the Celent Core Banking Solutions for Large Banks- A Global Perspective report which contains 9 vendor profiles and is 57 pages long. This report was not sponsored by TCS in any way. This reprint was prepared specifically for TCS but the analysis presented has not been changed from that presented in the full report.

For more information on the full report, please contact Celent at [info@celent.com](mailto:info@celent.com), or +1-617-262-3120.

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## Executive Summary

Core banking is the central processing unit of a bank. The banks, with the help of software vendors, have found the opportunity to leverage Internet technology to handle transactions. Most of the paper-based transactions of yesteryear have been replaced by digital alternatives. Automation has brought a mantra of efficiency and increased productivity. What had existed as a disparate group of branches is now a networked entity operating as a whole.

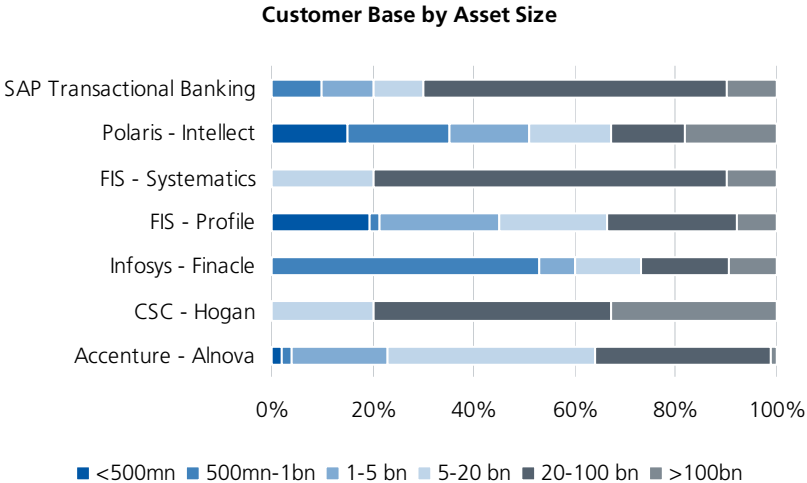
The core banking market looks mature, with a significant percentage of banks having replaced their legacy systems with more efficient and flexible core banking systems. Currently, a very low number of large banks are looking to change their core banking systems. This opportunity exists in banks that want to replace their legacy systems and in banks that look to consolidate core processing to a single vendor after a merger or acquisition.

Some of the global trends among the large banks are:

- Preference for an SOA system. With the bank having multiple systems from different vendors, large banks typically go for a service-oriented architecture, with reusable services and seamless integration ability.
- Customer-centric, multichannel technologies. Banks prefer core banking solutions with multichannel options like ATM, mobile, Internet, and IVR to attract and serve customers. Core banking solutions are also expected to facilitate product development and provide flexible customization capabilities.
- Reduced implementation time. Banks in developing countries that are looking for replacing their core systems would prefer to centralize and replace their systems in a phased but efficient way so as not to interrupt current processes. For large banks with significantly high number of branches, a complete replacement with reduced implementation time would be a challenge for the vendors.
- Major preference for in-house implementation. A majority of large banks in developing countries prefer in-house implementations to hosted implementations.

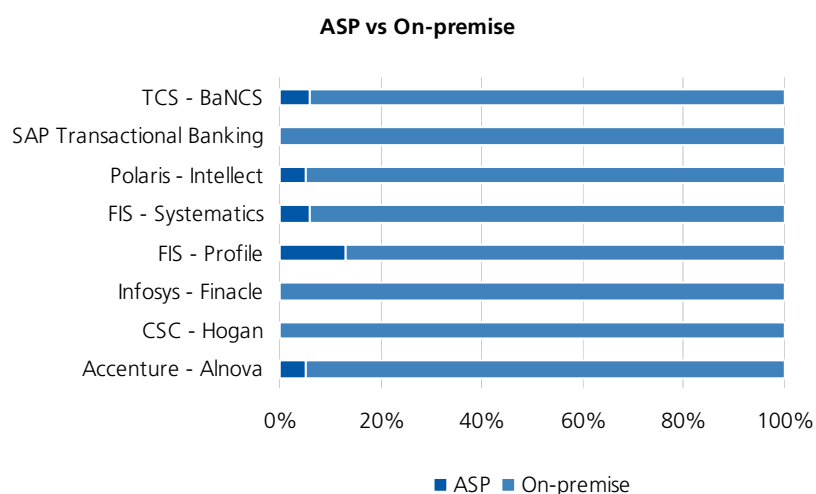
In this report, Celent examines the solutions focused on the large banks around the world using Celent’s ABCD Vendor View. The vendors with the most advanced technologies are TCS BαNCS and SAP Transactional Banking. On the breadth of functionality dimension, Accenture’s Alnova Financial Solution and TCS BαNCS scored over other solutions. SAP Transactional Banking, FIS Profile and FIS Systematics have the largest customer base, as estimated by weighted average asset size, among the solutions covered in this report. TCS BαNCS and Infosys’ Finacle lead in depth of client services.

**Figure 1: Hogan System Has the Largest Percentage of Its Customers Above \$100 billion**



Source: Vendors  
 Note: The asset breakdowns of FLEXCUBE and TCS BαNCS customers were not available.

**Figure 2: Implementations Are Predominantly On-Premise Among Large Banks**



Source: Vendors

This report contains a detailed analysis of vendor solutions with a summary on the strengths and weakness of each product. We analyse solutions catering to large banks around the world. This report is fifth in a series of vendor analysis of core banking solutions. The other reports are:

- *Core Banking Solutions for Small Banks—A North American Perspective, August 2009*
- *Core Banking Solutions for Large and Midsize Banks—A North American Perspective, September 2009*
- *Core Banking Solutions for Small Banks—A Global Perspective, October 2009*
- *Core Banking Solutions for Midsize Banks—A Global Perspective, December 2009*

### Classification of Vendor Solutions

Celent has broken down the core banking solutions based on the geographical location of their customer bases and the size of the banks served.

We have defined core banking solutions for large banks as those solutions whose weighted average asset size of customers is more than \$20 billion. In this report, we cover solutions where more than 10% of the banks are located in regions other than North America.

# ABCD Analysis

Celent has developed a framework for evaluating vendors called the Celent ABCD Vendor View. This is a standard representation of a vendor marketplace designed to show at a glance the relative positions of each vendor in four categories: Advanced technology, Breadth of functionality, Customer base, and Depth of client services. The factors used to evaluate each vendor in this report are listed in Table 1

**Table 1: ABCD Analysis for Core Banking Solutions**

Category	Factors Included
Advanced Technology	Architecture Hardware platform Integration (messaging/middleware layer) User interface Operating systems Databases
Breadth of Functionality	Teller Sales platform Internet Mobile ATM Customer data analytics / CRM Customization capabilities Languages supported Currency supported
Customer Base	Estimated total assets of banks using the system
Depth of Client Services	Change management Level of maintenance support Releases and updates

Source: Celent

Advanced Technology is based on the architecture of the system. Is the system written in an object-oriented language? Is a smart client used for the user interface? Can the system be ported to other operating systems and databases easily? Celent gave high marks to vendors that have incorporated recent technological advancements in their solutions.

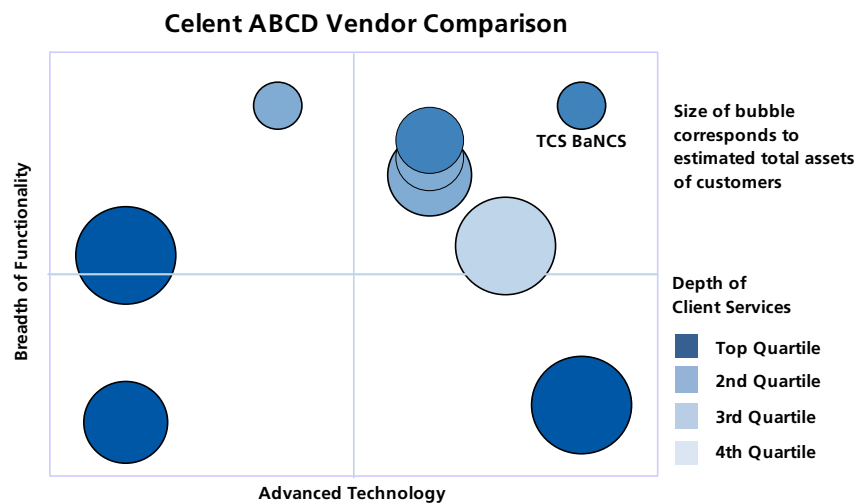
The Breadth of Functionality dimension looks at the various front end systems and other functionalities offered by the vendor. Celent gave highest marks to vendors that offered preintegrated features.

Customer base was estimated based on the number of banks served as well as the breakdown of customer by assets. A vendor that has 20 banks with US\$200 million in assets isn't as large as a vendor that has 20 banks with US\$2 billion in assets. Celent estimated an average asset size for each asset bucket in the vendor questionnaire and estimated total assets of customers using the core system.

Depth of client services measured the level of maintenance and post-implementation support offered by the vendor. Celent gave high marks to vendors that offered change management, training support, and continual monitoring and updates.

Note that different banks have different priorities, and the banks need to consider which dimensions are important in their environments. For example, if a bank wishes to implement the core banking solution without investing in modern platforms, it would typically choose a product having a low value in A. If the bank chose to implement a best-of-breed integration instead of a single vendor, B dimension can be discounted.

**Figure 3: Celent ABCD Vendor View**



Source: Celent

As shown in Figure 3, Tata Consultancy Services' BaNCS and SAP Transactional Banking led in Advanced technology. Both the solutions are based on a multilayered architecture and designed to run in multiple platforms and with multiple databases. The solutions also use a smart client as the user interface to the core system.

TCS BαNCS and Accenture’s Alnova solution ranked high on Breadth of Functionality. TCS BαNCS and Alnova offer diverse functionalities pre-integrated with the core. Alnova also provides option for customization using modifiable source codes. All the solutions have multilingual capabilities and support multiple currencies.

SAP Transactional Banking, Profile, and Systematics lead in customer base, having the highest estimated total assets of customers. TCS BαNCS and Infosys Finacle provide good customer support with continual monitoring, frequent updates, and change management programs.

### Banking Features

Table 2 on page 8 summarizes the different front end systems supported by the core banking solution. In this segment, the banks would prefer not to invest in a wide range of channels and would be selecting based on their customer profile. Thus, while almost all the channels are supported by the core banking systems, they are offered as optional modules.

**Table 2: Channel Support: Alnova, Intellect, and Finacle Offer Channel Functionalities Preintegrated with the Core**

	Alnova	Hogan	Finacle	Profile	Systematics	FLEXCUBE	Intellect	SAP	BαNCS
Teller	•	-	•	•	o	•	•	o	•
Sales Platform	•	-	•	o	o	o	•	-	•
Internet Banking	•	-	•	•	o	o	•	•	o
IVR	•	-	•	o	o	•	•	•	o
Call Center	•	-	•	•	-	o	•	-	o
ATM	•	-	•	o	o	•	•	-	•
Mobile	•	-	•	o	o	o	•	-	•

Source: Vendors

Key: • = offered with the core at no charge.

o = offered as an optional module or preintegrated through a partner.

- = not offered by the core banking system.

Table 3 on page 9, Table 4 on page 9, and Table 5 on page 10 summarize the consumer and commercial banking products supported by the core banking systems. Features such as small business administration, mortgages, lines of credit, compliance, transfers, and product management are offered preintegrated with the core at no extra charge.

**Table 3: Consumer Products: Mortgage Servicing Is A Popular Offering, While Other Features Are Optional**

	Alnova	Hogan	Finacle	Profile	Systematics	FLEXCUBE	Intellect	SAP	BαNCS
Loan origination	•	-	•	-	-	•	•	•	o
Mortgage Servicing	•	•	•	•	•	•	•	•	•
Securities	o	-	-	-	-	•	•	-	o
Mutual Funds	o	-	o	-	-	o	•	-	o
Trust	o	-	o	-	-	•	•	-	o
Wealth Management	o	-	-	-	o	o	•	-	o

Source: Vendors

Key: • = offered with the core at no charge.

o = offered as an optional module or preintegrated through a partner.

- = not offered by the core banking system.

**Table 4: Commercial Products: Systematics and TCS BαNCS Provide Most of the Functionality with the Core**

	Alnova	Hogan	Finacle	Profile	Systematics	FLEXCUBE	Intellect	SAP	BαNCS
Cash Management	•	•	•	•	•	•	o	•	o
Leasing	o	-	-	-	•	•	-	•	•
Letters of Credit	o	•	•	-	•	•	o	-	o
Lines of Credit	•	•	•	•	•	•	o	•	•
Loans (traditional bilateral)	•	•	•	•	•	•	•	•	•
Loans (trade finance)	o	-	•	o	o	•	•	o	•
Loans (factoring)	o	-	-	-	o	-	o	o	•
Loans (syndicated)	-	•	•	•	•	•	o	-	•
Loans (multicurrency)	•	•	•	•	•	•	•	•	•
Remote Deposit Capture	•	-	o	o	o	-	o	-	•
Payroll	•	-	•	•	-	•	o	-	•
Small Business Administration (SBA) Lending	•	-	•	•	•	•	•	•	•

Source: Vendors

Key: • = offered with the core at no charge.

o = offered as an optional module or preintegrated through a partner.

- = not offered by the core banking system.

**Table 5: Other Features**

	Alnova	Hogan	Finacle	Profile	Systematics	FLEXCUBE	Intellect	SAP	BαNCS
Asset / Liability Management (ALM)	o	-	o	o	-	o	o	o	o
Bill Pay	-	-	•	o	o	•	o	-	o
Cards	o	•	•	o	o	-	•	•	o
Check Books	•	-	o	o	o	•	•	•	•
Compliance: KYC, OFAC, Patriot Act	-	-	o	o	o	•	•	•	•
CRM Analytics	o	•	o	o	•	o	•	•	•
CRM Workflow	•	-	•	o	o	o	•	•	•
CRM Marketing	•	-	•	o	o	o	•	•	•
Data Warehouse	o	•	•	-	o	o	o	•	•
eStatements	-	o	•	o	•	o	•	•	•
Fraud Detection	-	o	•	o	o	o	o	o	o
Imaging/Computer Output to Laser Disk (COLD) storage	-	-	o	-	o	o	o	o	o
Payments	•	•	•	•	•	•	•	•	o
Profitability	o	•	o	•	•	•	o	o	•
Product Management	•	•	•	•	-	•	o	•	•
Risk Management	•	-	o	o	o	o	o	o	•
Stop Payments	•	•	•	•	•	•	•	•	•
Domestic Transfers	•	•	•	•	•	•	•	•	•

Source: Vendors

Key: • = offered with the core at no charge.

o = offered as an optional module or preintegrated through a partner.

- = not offered by the core banking system.

## Performance Benchmarks

In Table 6, Celent lists the vendor-provided performance benchmarking data.

**Table 6: Benchmarking Data**

Core Banking Solution	Benchmarks
Accenture: Alnova	<p>Live Data:</p> <p>At its largest customer in Latin America, Alnova processes 14 million clients at an average of 300 tps. The solution processes around 25 million operations at peak and around 8 million transactions on average per day.</p> <p>At its largest customer in Eastern Europe, Alnova processes 15 million clients at around 730 tps.</p>
CSC: Hogan System	<p>Lab Data:</p> <p>CSC has benchmarked its architecture, customer information, and card system in an IBM data center with transaction processing of 1,500 TPS (98% completed in less than 200 milliseconds) using 100 million accounts.</p>
FIS: Profile	<p>Live Data:</p> <p>Profile has benchmarked with 3,200 online transactions per second and 28,500 batch transactions per second with a 50 million account database.</p>
FIS: Systematics	<p>Lab Data:</p> <p>Systematics was benchmarked in an environment for an end-of-quarter process execution of the FIS Systematics products, IMPACS (IM DDA), Savings Time (ST), and Advanced Lending System-Servicing Manager (ALS-SM Lending). The batch processing mirrored a quarter-end batch processing schedule that allowed all postings to the account of record and the creation of all General Ledger entries.</p> <p>The accounts were processed at an average of 4,000 per second.</p>
Infosys: Finacle	<p>Lab Data:</p> <ul style="list-style-type: none"> <li>- Completed online transaction (OLTP) mix with 7,790 business transactions per second</li> <li>- Completed delivery channel transaction mix with business 19,288 transactions per second</li> </ul> <p>The processing was benchmarked with a simulation of 130,000 user load on a HP Itanium Montecito platform with an Oracle 10gr2 D</p>
Oracle: FLEXCUBE	<p>Lab Data:</p> <p>FLEXCUBE was benchmarked with a batch processing of 750 concurrent users at the rate of 316 tps, 1,500 concurrent users at 627 tps and 3,000 concurrent users at 1,209 tps. The test was done on Real Application Cluster (RAC) database servers configured on HP Superdome systems.</p>
Polaris: Intellect	<p>Live Data:</p> <p>The largest customer, Citibank India, processes 2.3 million accounts at an average of 6 million transactions per day.</p>
SAP Transactional Banking	<p>Lab Data:</p> <p>Benchmarked by IBM and showed capability to post at an average of 5,000 tps.</p> <p>Live Data:</p> <p>The largest customer, Deutsche Postbank, processes 26 million deposits accounts with an average of 10 millions transactions per day.</p>

Source: Vendors

**Table 6: Benchmarking Data**

<b>Core Banking Solution</b>	<b>Benchmarks</b>
TCS: BaNCS	Lab Data: <ul style="list-style-type: none"><li>- 10,700 tps on Montecito class Unix servers</li><li>- 9,445 tps on z-Series</li></ul> Live Data: <p>The largest bank in India, State Bank of India, implementation currently handles 175 million accounts and 35 million transactions a day,</p>

Source: Vendors

The following sections provide the reader with in-depth knowledge about each solution. The vendor profiles are the result of responses to Celent questionnaires, vendor briefings, and reference customer interviews. Vendors are listed in alphabetical order by company. There are summary tables of functional information and customer-related information. Blank rows in the tables indicate that the vendor chose not to answer those particular questions.

## Vendors

### Tata Consultancy Services: TCS BαNCS

Tata Consultancy Services (TCS) (NSE2: TCSEQ) is a global provider of technology services, outsourcing, and business solutions. TCS has over 141,000 employees and reported revenue of over \$6.01 billion during the year 2008–2009. TCS has around 140 offices worldwide.

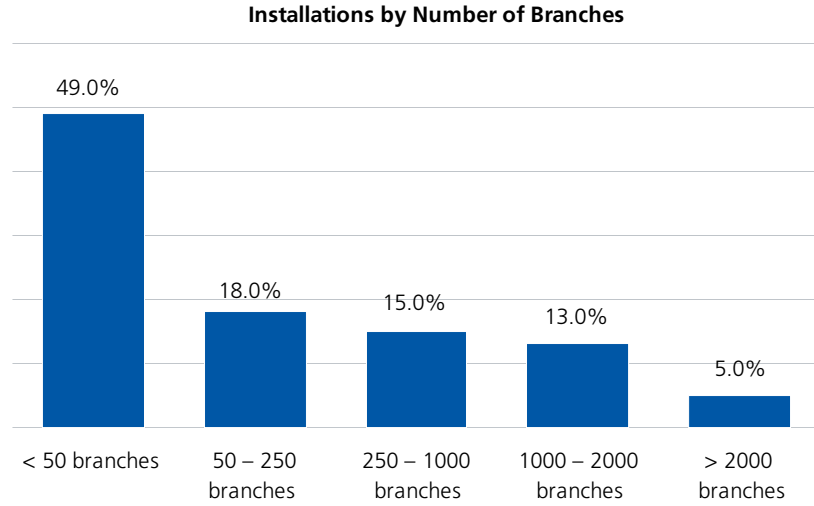
TCS Financial Solutions (TCS FS), a strategic business unit of TCS, provides financial product solutions to financial institutions globally across the banking, capital markets, and insurance domains. Its integrated financial product portfolio is offered under the brand name TCS BαNCS. TCS BαNCS includes financial components developed in-house by TCS and brought over through acquisition of Financial Network Services (FNS - Australia) and its core banking product BαNCS in 2005 and TKS Teknosoft (Switzerland) solution Quartz in 2006.

In 2008, TCS acquired Citigroup's captive center in Mumbai, Citigroup Global Services Limited (CGSL). This acquisition allows the company to expand its offerings to large financial services companies and allows the outsourcer to create banking processing platforms by integrating its products and process capabilities.

TCS has technology partnerships with IBM, HP, Sun, Microsoft, Oracle, and Microfocus. TCS also has partnerships with SAS (risk management), Fermat (risk management), Smartstream (reconciliation), China Systems (trade finance solutions), Advanced Digital Technology (front end), and Indus (remedial collection).

TCS BαNCS has been deployed in over 100 financial institutions around the world.

**Figure 4: More Than Half of TCS BαNCS Implementations Are in Banks with More Than 50 Branches**



Source: TCS

TCS BαNCS is built on a three tier architecture consisting of presentation tier, business tier, and data tier. It is a component-based system, where the presentation logic and data access logic components run within a component wrapper that isolates them from the business logic. This allows the business rules to evolve independent of the technology used. TCS BαNCS core banking solution is platform-agnostic and runs on a number of environments, notably IBM zSeries, Unix (IBM, HP, Sun), and Windows. TCS BαNCS is based on a customer-centric architecture, providing a single view of customers to the bank.

The solution is both SOA-enabled and designed for SOA. The integration to third party solutions is handled through WSDL, SOAP, and XML. The core banking functions are available as Web services and adapters based on J2EE and .NET platforms. These are deployed using middleware technologies such as TCS BαNCS Service Integrator, IBM WebSphere, and Microsoft BizTalk server.

**Table 7: TCS BαNCS Product Information**

<b>BαNCS Response</b>	
Product Name	TCS BαNCS Core Banking
Current Release	10.1 (Q1 2009)
Next Release	11 (Q2 2010)

Source: TCS

**Table 7: TCS B $\alpha$ NCS Product Information**

	<b>B<math>\alpha</math>NCS Response</b>
Language Written	COBOL 40% Java/JEE 35% XML/.NET/HTML 25%
Hardware Supported	IBM zSeries (mainframe) IBM pSeries (Unix) Sunfire servers HP Unix servers Windows Servers (Intel Xeon)
Operating Systems Supported	IBM z/OS IBM i5/OS IBM AIX Sun Solaris HP UX Linux
Database Supported	Oracle IBM DB2 Microsoft SQL Server
Middleware/Messaging Layer	B $\alpha$ NCS has its own delivery layer managed via transaction distribution gateway. Core banking functions are available as Web services and built-in adapters based on J2EE and .NET platforms. Can be deployed in TCS B $\alpha$ NCS Service Integrator, IBM WebSphere application server, or Microsoft BizTalk server
User Interface	Browser Client Smart Client
Transaction Handling	Real Time
Customization	Parameters Product Generation Tool Hooks for Custom Code
Retail vs. Commercial (may sum > 100%)	70% Retail, 45% Commercial
ASP vs. On-Premise	6% ASP vs. 94% On-premise
Multilingual	Yes
Multicurrency	Yes
Languages Supported	English, Spanish, German, French, Arabic, Russian, Chinese (simplified and traditional), Korean, Bahasa, and Greek Supports double-byte characters

Source: TCS

TCS B $\alpha$ NCS Core Banking includes the following components: deposit products, loans, collateral management, nonperforming loan management, bank guarantees, brokerage, mortgage servicing, leasing, lines of credit, payroll management, small business lending, check management, CRM workflow, risk management, transfers, product management, and Islamic banking support with the core at no charge. Among the various channels, TCS B $\alpha$ NCS Channels offers Internet banking, teller, sales platform, ATM, and mobile phone banking prein-

tegrated with the core. Other channels like IVR and call center are offered through regional partners (for example, Rubic SWIFTCALL in Australia).

TCS B $\alpha$ NCS suite of products offer other solutions such as loan origination (TCS B $\alpha$ NCS Origination), securities processing (TCS B $\alpha$ NCS Securities Trading & Processing), wealth management (TCS B $\alpha$ NCS Wealth Management), treasury (TCS B $\alpha$ NCS Treasury), payments (TCS B $\alpha$ NCS Payments), trade finance instruments (TCS B $\alpha$ NCS Trade Finance), and asset/liability management (TCS B $\alpha$ NCS Asset Liability Management) optionally.

TCS B $\alpha$ NCS offers a pricing structure based on functional usage and asset size, together with the number of branches for banks and number of customers for direct banking operations. TCS also provides risk-reward pricing for new users, where the initial license fee is reduced for a per-usage license.

**Table 8: Pricing Information**

	<b>B<math>\alpha</math>NCS Response</b>
Pricing Structure	Based on size of the organization (asset size, number of branches, or number of customers for direct banking) and functional usage
Annual maintenance/upgrade fee as a percentage of license fee	18% to 30%
Implementation fees as a percentage of license fees	Typically, 50% to 100%

Source: TCS

TCS B $\alpha$ NCS implementations are delivered through TCS teams, as well as its partners IBM, Logica, Padisar, and Apnetics. TCS FS has also worked with number of system integrators including EDS and local system integration partners in various geographies.

TCS FS offers various change management services such as train-the-trainer courses, classroom training courses, and parameter workroom training courses.

**Table 9: Implementation Information**

	<b>B<math>\alpha</math>NCS Response</b>
Typical implementation time	< \$500 million: 6 months \$500 million to \$1 billion: 6 to 9 months \$1 billion to \$5 billion: 9 to 12 months \$5 billion to \$20 billion: 12 to 18 months 20 billion to \$100 billion: 24 months >\$100 billion: 24 months

Source: TCS

**Table 9: Implementation Information**

	<b>B<math>\alpha</math>NCS Response</b>
Implementation approach	TCS FS has implemented TCS B $\alpha$ NCS in the following approaches: Direct approach—implemented in all branches simultaneously Phased approach—implemented in a few locations and rolled out throughout the bank Vertical approach—implemented based on the vertical domains or departments
Post implementation—change management / training services	Yes
Post implementation—monitoring period	Continual—TCS B $\alpha$ NCS formulates its product plan based on sources like market research and analyst firms, requirement analysis from prospective clients, and feedback from existing customers. Major release, once in 12–18 months, in addition to periodic functional releases

Source: TCS

**Summary.** TCS B $\alpha$ NCS Core Banking provides the ability to manage various banking processes, from origination to servicing, across multiple channels. The core banking solution has a significant presence in Middle East Asia and Asia-Pacific regions, including China, with some implementations in Europe, Latin America, and Africa. TCS B $\alpha$ NCS leverages the TCS Global Network Delivery Model (GNDM) for multinational deployments among banking and financial services.

## Leveraging Celent's Expertise

If you found this report valuable, you might consider engaging with Celent for custom analysis and research. Our collective experience and the knowledge we gained while working on this report can help you streamline the creation, refinement, or execution of your strategies.

### Support for Financial Institutions

Typical projects we support include:

**Vendor shortlisting and selection.** We perform discovery specific to you and your business to better understand your unique needs. We then create and administer a custom RFI to selected vendors to assist you in making rapid and accurate vendor choices.

**Business practice evaluations.** We spend time evaluating your business processes. Based on our knowledge of the market, we identify potential process or technology constraints and provide clear insights that will help you implement industry best practices.

**IT and business strategy creation.** We collect perspectives from your executive team, your front line business and IT staff, and your customers. We then analyze your current position, institutional capabilities, and technology against your goals. If necessary, we help you reformulate your technology and business plans to address short-term and long-term needs.

### Support for Vendors

We provide services that help you refine your product and service offerings. Examples include:

**Product and service strategy evaluation.** We help you assess your market position in terms of functionality, technology, and services. Our strategy workshops will help you target the right customers and map your offerings to their needs.

**Market messaging and collateral review.** Based on our extensive experience with your potential clients, we assess your marketing and sales materials—including your website and any collateral.

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