

Software Quality and Testing for Financial Services

**Solutions that address the needs of banking,
insurance and capital markets firms**



Improved reliability and stability for your core financial systems

FS firms have long relied on sophisticated IT solutions that deliver real-time reliability, operating benefits and defect-free solutions to help drive business results.

—Financial Services World Quality Report 2009

More than any other industry, financial services operate in a dynamic and complex environment in which day-to-day operations are driven by high volume events conducted in real-time. Whether you are an insurance company processing claims, a capital markets firm performing trades or a credit card company checking millions of transactions for fraudulent activity, your business is riding on the accuracy and availability of your IT systems. Every systems user from business users, regulators, and customers to vendors brings increasing requirements for speed, transparency, and accountability.

To keep pace, financial institutions must continually build innovative solutions which are enabled by modifications to existing applications or new development. Increased requirements for data security, privacy, regulations, and customer expectations combine to add new pressures to overloaded IT teams.

For over 40 years, Capgemini has helped global financial institutions overcome business and IT challenges.

Our successful quality assurance services help maintain or improve the quality of your applications and are powered by:

- Over 6,400 career testers—2,000 devoted to financial services—and 11,000 application experts
- Dedicated FS Innovation Labs fostering solutions to solve FS-specific challenges
- Deep industry domain expertise in insurance, capital markets, banking, wealth and asset management, payments and cards, and risk and compliance
- Rightshore® network of centers in 32 cities across 15 countries bringing the right skills in the right location at the right cost
- More than 800 professionals certified in technology, business and leadership domains including Certified Software Test Engineer (CSTE), ISTQB and NSE's Certification in Financial Markets.
- Strong alliance partnerships with Guidewire, Hewlett-Packard and Swift for industry-specific testing accelerators and solutions.
- Award-winning organization with the distinction of winning HP Partner of the Year, Microsoft Enterprise Partner of the Year, and the IBM Beacon Award—all in the same year.

Financial Services World Quality Report



The Financial Services World Quality Report takes a look at the maturity levels and issues faced by testing organizations within financial services institutions globally.

Drawing on responses from 60 financial services firms, the report takes lessons learned from over 20 Quality Blueprint assessments and is produced in collaboration with HP and Sogeti.

Capgemini's Managed Testing Services: End-to-end support for your organization

Managed Testing Services is Capgemini's collaborative approach to outsourcing testing and QA services for banks, insurers or capital markets firms who want to transform the testing function and achieve quality services without the expensive overhead or loss of control.

Capgemini provides global delivery capabilities and access to scalable resources, via our network of test centers, to accommodate the peaks and troughs in demand experienced by all IT departments.

Proving the benefits of outsourced testing

We have successfully delivered several long-term managed testing contracts at large global financial firms. A managed testing contract can help:

- Significantly reduce total testing cost by achieving a balanced execution through global teams working onsite, near shore and offshore, often resulting in cost savings of up to 25% in year one;
- Standardize activities using best-practice test processes gained from over 20 years experience working with financial services testing organizations;

- Measurably improve quality by achieving detection rates of more than 97% for high-severity defects;
- Mitigate technical and business risks;
- Deliver flexibility and scalability with highly skilled resources to accommodate increasing or decreasing demands;
- Infuse new skills and capabilities into your organization from multiple suppliers.

Our business-driven governance model and test execution is supported by CMMi Level 5 assessed processes.

Capgemini was named HP Application Implementation Partner of the Year in 2010 for our work with financial services firms

REAL BENEFITS FOR FINANCIAL SYSTEMS

Capgemini has helped some of the world's top financial institutions improve performance.

- Optimized quality assurance processes to reduce post production defects by 25% or more
- Achieved cost savings starting at 15% and up to 50% or more for fully automated or managed testing services
- Lowered post production defects by 25%, test execution time by 15%, and testing preparation time by 20% with 0% defect leakage to production through testing program management
- Reduced test failures due to unavailable test data by 70%
- Decreased downtime by 20% and achieved 15% overall project savings using defect prediction modeling

Proven accelerated solutions for banks, insurers and capital markets firms

“Capgemini is one the top leaders in software testing. The FIX Protocol Testing Accelerator strengthens this leadership. First it deepens the vertical domain of the company by providing a testing framework for capital markets. Second, it provides an integrated tool that not only focused on test execution but also on definitions, requirements and preparation.”

— **Dominique Raviart**
Research Director, NelsonHall

The majority of respondents from the *Financial Services World Quality Report* acknowledge that while testers in their organization may have some domain knowledge, less than 10% are considered domain experts. Within the industry post crisis, the competition for financial services testing talent is high. Testers with underlying knowledge of domain processes are sought after to help create effective testing for critical applications.

In addition, the Report found automation which can significantly reduce testing time and costs is severely underutilized in financial services.

We've invested in developing testing solutions tailored specifically to bring applications to market faster for banks, insurers and capital markets firms, including:

FIX Protocol Testing Accelerator

Our FIX Protocol Testing Accelerator provides the industry's first and only complete testing solution for equities, FX, fixed income, futures and options asset classes. This end-to-end solution is the result of collaboration between Capgemini, Hewlett-Packard, Aegisoft and Blueprint Systems and contains a customizable methodology to support common FIX-related testing:

- FIX certification testing
- Performance testing
- RegNMS compliance testing
- System testing

Cards Testing Workbench

Capgemini's Testing Workbench for card systems includes:

- CardsGEM: Key accelerators for generic business test scenarios specifically for the Cards domain. The 3,000+ test scenarios can be used with a variety of applications and technologies
- VisionPLUS: 6,000+ reusable test conditions
- PRIME: 2,000+ reusable test scenarios

Guidewire Accelerators

Capgemini offers our clients an accelerated solution for Guidewire applications that reduces testing time by up to 50%. Using a structured methodology and proprietary content that leverages our strong claims, policy and billing expertise, Capgemini provides end-to-end testing without adding substantial time and cost. Our complete lifecycle testing services include data conversion, functional, system integration, regression and acceptance testing.

Our extensive Guidewire library includes over 1,100 test cases, 1,300 components and scripts for automation, 800 test scenarios, 300 use case models and documentation plus test plans, test automation framework models, in-house testing tools and training materials.

Capgemini's expertise in testing financial services packages and applications

Banking		Capital Markets		Insurance
<ul style="list-style-type: none"> ■ AUTOSCORE ■ CACS ■ CardLink ■ CardPac ■ CLARUS ■ DebtManager ■ Essentis ■ Flexcube ■ Hogan ■ LoanQuest ■ MortgageServ 	<ul style="list-style-type: none"> ■ Probe ■ Raptor ■ RISKNET ■ Strategyware ■ TRIAD ■ TS2 ■ VisionPLUS 	<ul style="list-style-type: none"> ■ Bloomberg & Calypso integration ■ Brass ■ Calypso ■ Cross Asset Class Analytics ■ Sungard OMS ■ Global Share ■ InvestOne ■ IOM ■ Lens 	<ul style="list-style-type: none"> ■ Limiting Exposure ■ Market Risk Summary ■ MW Analytics ■ NOVA ■ OASYS ■ Online FX, FXAll ■ Operational Risk Framework ■ SWIFT ■ UBIX 	<ul style="list-style-type: none"> ■ Agency Port ■ AIS ■ Amarta ■ Cogen ■ Eclipse ■ Guidewire ■ iLog ■ Ingenium ■ OneShield ■ Pega ■ PMS

PegaRULES Process Commander Testing Toolkit

Capgemini's state-of-the-art automated test methods and tools work with Pega applications to test financial service business rules. For example, rate matching is a tedious and time-consuming task involving manual processes to conform to all the rate variances within the auto insurance business rating methodology.

Capgemini developed a testing harness that provides complete rate matching functionality between several components including legacy, mainframe and web-based applications.

By employing automation tools to test and validate business rules, we add breadth and depth to your testing efforts. Our pre-defined testing parameters, hands-off automation methodologies, and innovative solutions accelerate and simplify a complex process.

Most FS firms reuse only a fraction of testware, showing there is room to streamline. Only 16% of FS respondents said they reuse 50% or more of the quality and testing artifacts used to test a new version of an existing application

— Financial Services World Quality Report 2009

Test maturity assessment and improvement using Capgemini's TPI® and Quality Blueprint

Our approach to test process assessment and improvement is an end-to-end service that helps financial firms achieve a higher level of test maturity, lower total cost of ownership, and accelerated time to market. Based on a combination of our industry standard TPI® methodology and Quality Blueprint framework, we provide a clear and objective assessment of the relative maturity of testing processes and structure, identifying a practical roadmap, plus accelerators for faster step change improvement.

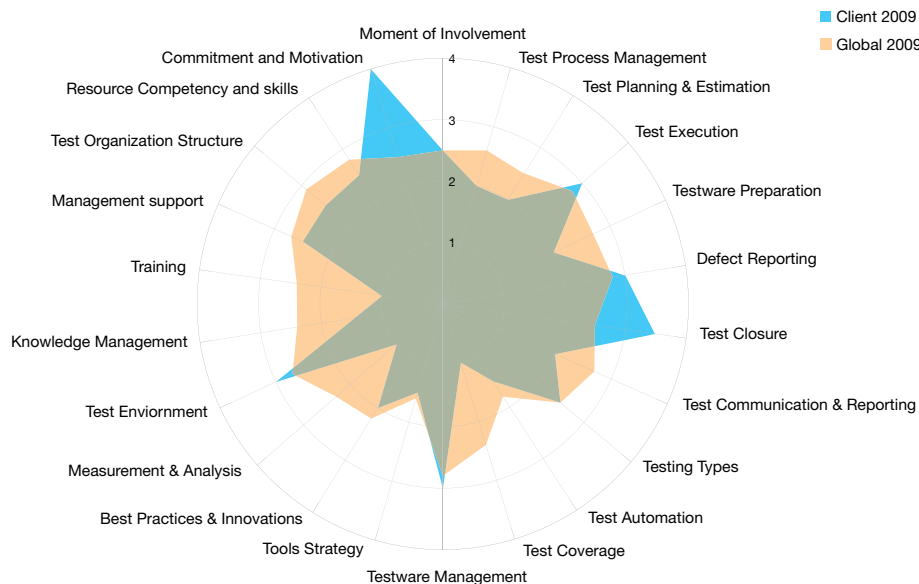
Our Quality Blueprint assessments compare your testing organization to the testing maturity of over 20 other global financial firms across a number of dimensions including people and organization, processes and tools and moment of involvement. Our assessments provide you with:

- Insight into the existing maturity of your test processes based on TPI®;
- Benchmarking against FS peers with Quality Blueprint;
- A clear roadmap of staged improvements to meet your business-specific goals;
- Faster implementation using off-the-shelf accelerators and Capgemini proprietary tools to achieve a step-change in testing maturity.

We work together with your team to help create a testing organization that addresses your key test execution challenges—enabling you to deliver greater performance efficiency and effectiveness as well as reducing production defects, lowering costs, and improving quality of output.

For the last four years, Capgemini has won the IBM Beacon Award in recognition of market innovations such as TMap® Plug-ins for IBM Rational tools

Sample Quality Blueprint benchmark



Testing services from a CMMi Level 5 partner

Capgemini has a dedicated focus on continuous improvement. For each project, our teams capture best practices and reusable artifacts which are consolidated, reviewed and published to a global knowledge repository. Our library includes test cases, test scripts, test plans, test frameworks, models, in-house testing tools and training materials all developed specifically for common financial services applications. By leveraging Capgemini's proprietary content, your firm can jump start testing efforts.

Functional testing

With over 20 years of functional testing experience with financial services firms, Capgemini has delivered quality on time and within budget through unit, integration, system, and user acceptance testing. Our functional testing solutions are supported by extensive training programs, CMMi Level 5 standards and procedures, award-winning quality metrics and deep industry knowledge. By continuously increasing test coverage and efficiencies, we have helped global financial firms reduce defect leakage by over 60% and increase user and customer satisfaction.

Performance engineering

Today's financial services institutions are continuously expanding into new markets and products, often increasing the load on IT systems and driving a need for performance engineering across the testing lifecycle. Capgemini can help predict, test and manage loads on your most critical systems to ensure performance, scalability and reliability.

Security testing

Each day financial institutions trade millions of dollars worth of cash or commodities. A single security breach can result in severe long-term damage to a firm's financial stability and customer trust. Capgemini can make your applications more secure by identifying and addressing security vulnerabilities and instituting security testing as a standard part of quality processes. Our security professionals undergo extensive training on security standards, procedures, tools and technologies—supported through our alliance partnerships.

SOA testing

As the industry adopts and transforms to a Service Oriented Architecture (SOA) paradigm, new quality challenges are being uncovered. How can you leverage automation in an environment with no graphical interface? How do you ensure services developed using different technologies by globally diverse teams will work together? To address these issues and others, your firm must leverage a combination of traditional test methodologies, new SOA-specific test approaches and technology innovations. Capgemini can help you find the right balance by providing SOA quality consulting and testing expertise, bringing you best-of-breed industry technologies.

Test data management

Before outsourcing testing activities, your firm needs a systematic approach to test data management. Capgemini manages testing for some of the world's largest financial firms. We've used our experience to build a test data management framework that addresses data management issues unique to financial firms that must comply with regulations such as data privacy. Our approach lets us create, store and de-personalize your test data using layers of masking techniques to ensure data security.

Test environment management & virtualization

Virtual test lab and environment automation helps you manage and govern pooled and shared virtual or physical resources, including servers, storage and networks. Through proper provisioning, network, server and storage resources can be scheduled and allocated on-demand across your firm's applications and processes.

In 2010, Capgemini was named Microsoft's Global Enterprise Partner of the Year

Capgemini set up Testing Centers of Excellence for leading financial services firms to standardize and optimize testing efforts.

The situation	The benefits
<p>Over 8 years ago, Capgemini began working with a leading Wall Street firm using a traditional staff augmentation model, providing experienced testers offshore to help reduce costs. By year three, Capgemini offered multiple engagement and pricing options to help drive overall business value. Today, we provide a full spectrum of testing services using a managed services model.</p>	<ul style="list-style-type: none"> ▪ Defined and introduced new testing metrics to measure effort variance, schedule variance, test coverage and execution percentage ▪ Achieved offshore leverage of more than 80% ▪ Realized cost savings of nearly 40% ▪ Improved test coverage by 95% ▪ Identified applications suitable for automation and achieved 100% automation compliance ▪ Achieved 0.3% post production defect ratio ▪ Optimized QA processes by 30% ▪ Saved time on regression testing by nearly 95% per cycle
<p>Capgemini worked closely with a global bank to develop and standardize test methodologies and processes to be used globally. We identified metrics for all phases and designed processes to collect and analyze data for reporting.</p>	<ul style="list-style-type: none"> ▪ Compressed the testing cycle by more than 50% ▪ Achieved 100% test coverage for critical applications ▪ Reduced production incidents by 300% ▪ Achieved annual cost saving of 30%

For more information, contact us at financialservices@capgemini.com.



About Capgemini and the Collaborative Business Experience

Capgemini, one of the world's foremost providers of Consulting, Technology and Outsourcing services, has a unique way of working with its clients, called the Collaborative Business Experience.

Backed by over three decades of industry and service experience, the Collaborative Business Experience™ is designed to help our clients achieve better, faster, more sustainable results through seamless access to our network of world-leading technology partners and collaboration-

focused methods and tools. Capgemini utilizes a global delivery model called Rightshore® which aims to offer the right resources in the right location at competitive cost, helping businesses thrive through the power of collaboration.

Capgemini reported 2009 global revenues of EUR 8.4 billion and employs over 90,000 people worldwide.

More information about our services, offices and research is available at www.capgemini.com.