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EXITUS ACTA PROBAT

Exactpro – Industry's Trusted Innovation Partner



AI Testing for Financial Institutions
Independent software testing of trading, post-trade and banking systems

Test Strategy Development
Comprehensive test strategies for responsible governance and increased resilience

Regulatory Compliance
Enabling compliance teams to align rule books, system requirements, testing artefacts and coverage reporting

Development & Prototyping
Track record of award-winning financial technology innovation

AI Literacy
Capability building, support of enterprise-level AI integration

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INNOVATE WITH AI TESTING

Exactpro: innovation partner for mission-critical infrastructures

Exactpro is an independent provider of AI-enabled software testing services for financial organisations. Our clients are financial market infrastructures across 25 countries. We help our clients to improve scalability, latency and operational resiliency, decrease time to market and maintain regulatory compliance.

Headquartered in the UK, Exactpro operates delivery centres in Georgia, Sri Lanka, Armenia and the UK, representative offices in the US, Canada and Italy, and has a global distributed network of consultants.

On top of AI-driven testing and test automation capabilities, we offer industry-proven expertise in test strategy development, software development and prototyping, facilitating regulatory compliance and reporting, AI Literacy building and support of enterprise-level AI integration.

With deep domain expertise at the intersection of finance, technology and artificial intelligence (AI), we have been successfully guiding financial technology operators to a deeper understanding of their progressively more complex technology assets through AI-enabled software testing.

Our client network



Reach out to us via ***info@exactpro.com*** to set up an introductory meeting.

Meet our clients and partners

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Meet the global team



Iosif Itkin
CEO, Exactpro Group, Malta



Alexey Zverev
CEO, Exactpro Group, UK



Natia Sirbiladze
CEO, Exactpro Georgia, Georgia



Kirill Zagorouiko
Chief Operating Officer, Canada



Alyona Lamash
Director, Head of Risk Management Practice, UK



Thomas Toller
Managing Director, USA



Marina Kudryavtseva
Head of DLT & Corda, SVP, Technology, UK



Ian Salmon
Business Development, UK



Pavel Medvedev
Head of Non-functional Testing, Canada



Maxim Rudovsky
Chief Technology Officer, UK



Mikhail Odintsov
Head of Functional Testing, Georgia



Maxim Nikiforov
Technology, NFT, UK



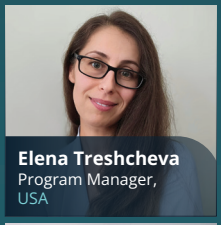
Dmitry Kolpakov
Chief Financial Officer, Sri Lanka



Anna-Maria Lukina
Marketing Director, Portugal



Alyona Bulda
Head of Global Exchanges, SVP, Spain



Elena Treshcheva
Program Manager, USA



Sona Oganesyan
CEO, Exactpro Armenia, Armenia



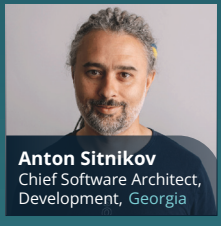
Asya Legotina
Technology, Big Data, UK



Dmitry Doronichev
Head of Post Trade Division, Sri Lanka



Daria Degtiarenko
Marketing, Communications, Georgia

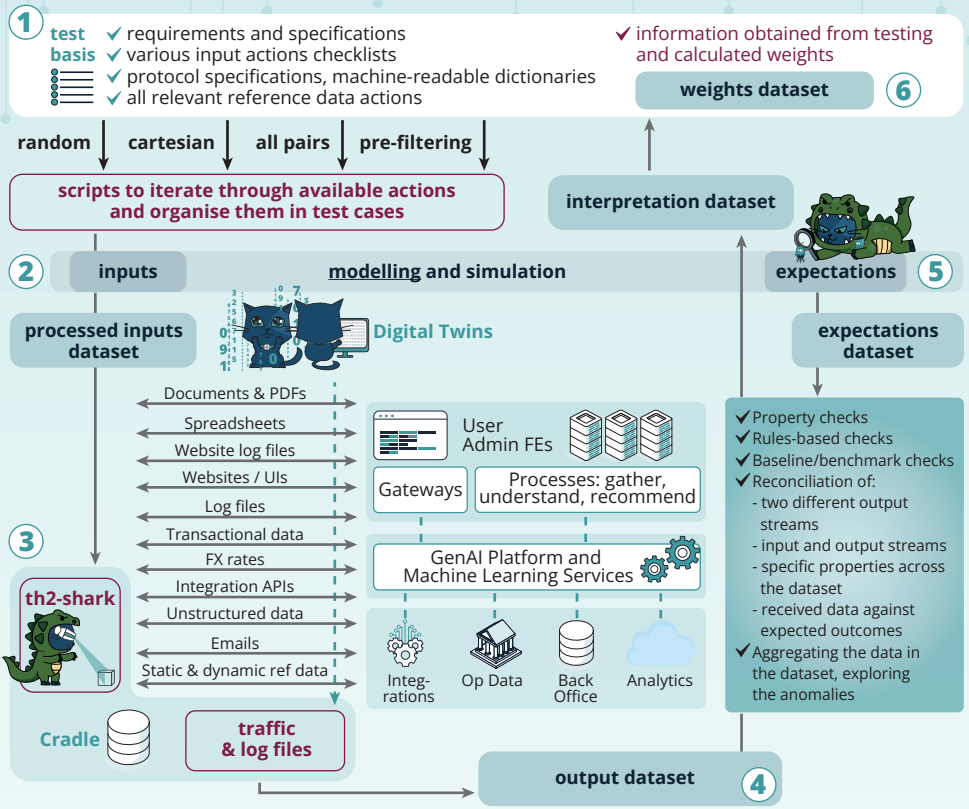


Anton Sitnikov
Chief Software Architect, Development, Georgia



Stanislav Klimakov
Product Architect, UK

AI Testing for Retrieval-Augmented Generation (RAG) systems



Access AI Testing use cases for trading, post-trade and more system types

Industry associations we support and partner with

FIX TRADING COMMUNITY — INDUSTRY-DRIVEN • INDEPENDENT • NEUTRAL

WFE WORLD FEDERATION OF EXCHANGES

Zero Outage INDUSTRY STANDARD

ISTQB Platinum Partner — International Software Testing Qualifications Board

Swift

FIA

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INNOVATE WITH AI TESTING

You received an AI mandate. What happens next?

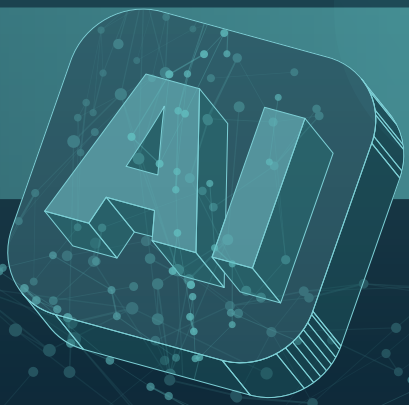
Many financial organisations today have an explicit or an implicit AI mandate. But what makes this technology transition unlike any other? It is the fact that the technology itself may actually only be part of the challenge.

AI models are non-deterministic, which means monitoring, validation and 'humans-in-the-loop' become ongoing responsibilities rather than one-time-setup tasks. On top of that, there are transparency, interpretability and explainability implications to mitigate.

What's a good place to start?

A pattern we see across the industry is AI adoption being launched in QA, particularly, in software testing. It allows teams to gain immediate operational benefits while keeping risk exposure low and builds a practical understanding of how AI behaves before it reaches customers or markets. This foundational knowledge can then be transferred across the enterprise to benefit more use cases and projects.

At Exactpro, we work with regulated fintech teams that take this approach – helping them apply AI safely and deliberately in practice. This can start as a small pilot, a focused testing engagement or an effort to build internal AI capability and governance discipline.



We are happy to have a conversation on your AI integration plans and strategy if this is something you are currently evaluating.

BUILD SOFTWARE TO TEST SOFTWARE

Pilot engagement in AI Testing

An **AI Testing** engagement with Exactpro allows organisations to:

- ☑ Understand the AI momentum and safely explore the value of AI for the organisation in a controlled, low-risk environment;
- ☑ Focus not just on the present, but look into the future: start with sandbox experimentation and education, foster top-tier talent and necessary cultural changes;
- ☑ Build a solid foundation in AI Testing to propel innovation across all business lines.

Organisations can select a relevant system and run a time-boxed proof-of-concept (PoC) engagement to explore its functionality and available artefacts, assess the applicability of AI-enabled tools, assemble a prototype test harness and experiment with test design.

Running a time-boxed pilot engagement in **AI Testing** enables:

- **Practical**, **hands-on exposure to AI** introducing internal QA, DevOps and engineering teams to real-world AI usage – AI-enabled test case generation, defect analysis and prediction, results analysis, continuous model improvement – in a controlled environment without needing to build internal AI capabilities from the ground up;
- **Fast feedback on value and risks** across a set of criteria including software testing speed, costs, quality of the information obtained about the system being tested and quality of the models involved in testing, whilst offering measurable outcomes to support or adjust broader AI strategies;
- **Knowledge transfer & upskilling** for internal teams getting introduced to AI Testing insights, tooling practices and evaluation metrics relevant for further AI integration;
- **Trust and better internal buy-in** reducing AI resistance via safe and well-contained experimentation;
- **Scalable**, **reproducible governance practices** aligned with future AI initiatives (e.g. ISO 42001 readiness).

An AI testing partnership is a pilot project that delivers value fast, builds foundational knowledge and reduces the perceived risk of adopting AI organisation-wide.

Join our PoC programme for banks

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Test strategy development

*'In the high-risk, compliance-heavy environments where financial systems operate, the role of testing as an information gathering tool is sometimes overlooked. Formulating a **robust test strategy** helps prevent potential negative factors and defects early, well before they can occur further in the lifecycle, and formulate all stakeholder needs well ahead of the last development stages. The test strategy defined during a collaboration can provide an industry-tested software transformation framework transferable to client's projects of any scale.'*



Iosif Itkin
CEO and co-founder,
Exactpro

At early stages of software delivery, organisations can benefit from a comprehensive tailor-made test strategy (including an AI strategy, in cases of AI integration) in the form of a structured testing framework aligned with industry's recommended practices. For ongoing projects, organisations may choose to have their existing test strategy reviewed and enhanced from the perspective of using AI-enabled tools and highly optimised test libraries.

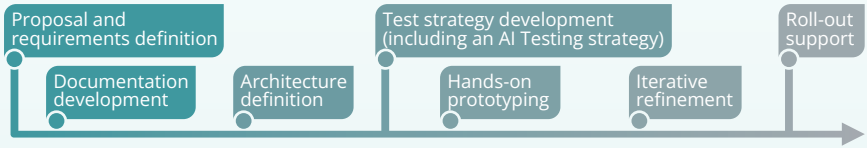
Exactpro helps **streamline** the development and implementation of guidelines that can be applicable across **clients' projects of any scale** and describe in detail the approaches relevant to specific testing sub-processes. The test strategy covers the **overall approach to software testing**, an integrated **product quality model** and the **test policy** reflecting the corporate view on testing in the organisation. It also helps outline and analyse the relevant **regulatory frameworks**, **test environments**, **tools**, and **data** required for comprehensive testing. It lays the groundwork for agile development and **parallel workstreams**.

By addressing key architecture-related questions from the outset, a well-rounded test strategy helps **shape system design**, **define risk factors** and **delivery criteria**, embedding testability into the design. The proposed test strategy accounts for **non-functional requirements and system characteristics** such as resilience under spikes (e.g. market volatility), failover and recovery capacities, scalability, data integrity across APIs and services – and ensures they are **factored into future development from the start**.

Test, collaborate, lead: turning industry engagement into strategic advantage

Full-cycle prototyping and delivery support

Exactpro delivers full-cycle solution prototyping tailored to the needs of financial organisations, ensuring that **every innovation-driven initiative** aiming to explore, validate and scale new solutions is **built on a solid foundation**. Drawing on vast expertise in financial technology, we support clients across the entire lifecycle:



By integrating AI-enabled testing considerations into the earliest delivery phases, we help organisations de-risk innovation, accelerate time-to-market, and align prototypes with enterprise-level resilience and compliance expectations. Whether shaping PoCs to validate feasibility, preparing RFP responses that demonstrate capability, or developing MVPs that pave the way for production-ready solutions, we act as a partner in innovation.

Our delivery capabilities are industry-tested in client engagements. Just to name a few:

- The **SSImple** platform fully automates SSIs, ensuring seamless compliance with FMSB and UK/EU Taskforce goals to support T+1 settlement.
- **Gevamu** integrates Distributed Ledger Technology (DLT) networks with payment service providers, bridging DeFi with mainstream banking systems.
- The **ClearTH test automation framework** for post trade was adapted for software testing of DLT applications built using DAML, the open-source smart contract language created by Digital Asset.
- **Tokenization platforms** developed in collaboration with client teams digitise traditional assets into secure blockchain-based representations.
- The functional testing approach for the Corda-powered **Central Bank Digital Currencies (CBDC)** Sandbox was developed to demonstrate the effectiveness of our testing methods for DLT-based tokenised assets.

Swift HACKATHON at Sibos

Our team's solutions have a consistent track record of recognition at **Swift Hackathons**.

If Swift Hackathons were the Olympics...

Rank	Company	1	2	3	Total
1	BNY Mellon	2	2	0	4
2	Deutsche Bank	2	0	0	2
3	**Exactpro**	**1**	**1**	**1**	**3**
4	Capgemini	1	1	0	2
5	Chainlink	1	0	0	1
6	Secretarium	1	0	0	1
7	IBM	1	0	0	1
8	JP Morgan	1	0	0	1

INNOVATE WITH AI TESTING

Regulatory compliance for financial organisations



'Have we updated the rule book with the newest regulatory provisions?' 'Which of our rule book articles are covered by tests?' 'Which obligations remain untested?' 'What is our coverage percentage by regulation/jurisdiction?'

As financial organisations' regulatory compliance obligations become increasingly complex and expansive, the links between them and the test coverage evidence may suffer. This complicates the work of compliance teams, but also reveals mapping and reporting processes that are not streamlined, which causes interdependencies to go obsolete and integration of new obligations to get delayed.

Conformance automation frameworks such as th2-RC enable compliance teams to align rule books, system requirements, testing artefacts and coverage reporting. With th2-RC, rule books can get continuously updated with relevant rules and standards without compromising coverage and traceability coherence. th2-RC can accommodate any regulatory framework, trading rules, asset classes and data protocols.

th2-RC's AI-assisted coding plugin (that supports various LLMs) underpins rule creation but is not involved in test library execution. This allows the solution to achieve advanced functionality while being resource-light and fully compliant with regulations on handling personal and financial data.

th2-RC capabilities

FUNCTIONALITY

- Bi-directional mapping of regulatory obligations to rule book provisions in any jurisdiction (e.g., Reg NMS, Reg SCI, CFTC, MiFID II, DORA, etc.) and across regimes.
- Easy and continuous addition of new rules / standards using natural language.
- Linking atomic rule book provisions to test artefacts.

USABILITY

- Intuitive controls for dynamic coverage reporting and gap analysis – formalise, track and monitor all your controls from a single interface.
- Real-time alerting and monitoring – receive alerts, document your observations and manage the implementation of recommendations.
- Express reporting – generate your customised plans and reports in just a few clicks, ready to be shared.

BUSINESS VALUE

- **Native to financial systems out of the box**: requires minimal venue-specific customisation, compared to generic enterprise-grade compliance tracking solutions.
- **Scale- and domain-agnostic**: benefits small-scale venues and technology operators preparing for regulatory filings as well as large venues with cross-enterprise compliance needs.

Attaining reliable AI-driven decision systems in FMIs



Alyona Bulda
Senior Vice President, Technology, Exactpro



Daria Degtiarenko
Senior Marketing Communications Manager, Exactpro

With AI-enabled systems becoming embedded in enterprise-level tasks – across sectors, but in finance in particular – the safety guardrails should be as strong as ever, if not stronger, and financial services organisations can lead the way. Quality frameworks in financial technology are grounded in both expert domain knowledge and comprehensive frameworks like ZOIS and DORA which epitomise and stand for continuous cross-sector work for the sake of reinforced operational and cyber resilience across diverse sectors and fields of knowledge.

As a technology services provider directly involved in helping exchanges, post-trade system operators and banks enhance the operational resilience of their systems, we have recently contributed to the AI quality discourse. In our **Test Strategy and Framework for RAGs** case study (available via the QR code below), we transpose the software testing approach historically tailored for smart order router (SOR, an inherent part of algorithmic trading) systems to Retrieval-Augmented Generation (RAG) systems. The former represents a more traditional financial platform and the latter an AI-enabled infrastructure with a Generative AI component(s). In the case study, we compare the two system types and explain why RAG and other Gen-AI-driven system operators can benefit from the industry-proven AI Testing approach.

Insights from an independent software testing perspective can contribute to a deeper understanding of the system and its technology and limitations by system operators. Such insights can be used for better planning and strategic prioritisation at the early stages of a new project, as well as during ongoing projects, in technology migrations and prior to launches of brand-new systems.

Engaging AI-enabled testing as a managed service or a capability building program on either traditional or emerging financial technology implementations provides access to cutting-edge know-how – not as an experiment, but as an industry-tested service proven to deliver tangible improvements in capacity, reliability, test coverage and time to market. In the context of AI-enabled systems in digital finance, the methodology helps embed transparency, reproducibility and safety of AI-driven decisions, fostering greater confidence in their real-world applications.

focus | Monthly insight from the WFE and our member exchanges



Scan to unleash Ragsor

Access the full article

INNOVATE WITH AI TESTING

From fragile scripts to comprehensive coverage

Integrated framework for automation in GUI testing

The challenges that often arise in GUI testing include lack of transparent coverage visibility, fragility of UI testing automation, uncontrolled growth of test suites, usage of BDD assets that are directly translated into executable GUI scripts and do not scale into reliable automation, focus on step-by-step GUI interactions while the system's state changes independently, as well as absence of property-based validation.

Many of our clients operate dynamic, highly interactive applications using frameworks, such as React, supported by Node.js-based build and execution environments. To test their frontends, the Exactpro team has developed lightweight automated checkers which can reveal issues that are difficult or costly to detect through other approaches. Our test library generation is supported by a combination of model-based and property-based testing principles. The approach:

- Reuses existing 'example-based' test assets/BDD assets as behavioural specifications and a foundation for workflow modeling, enabling rapid generation of test batches that cover broad classes of system behaviour.
- Makes Playwright or a Playwright-like UI automation usable at scale through rule-based validation and reduced maintenance overhead.
- Provides transparent, auditable reporting, where existing test assets and acceptance criteria are traceably linked to the generated test library monitoring issues across frontend, protocol and backend layers.
- Is well-suited for complex, data-heavy and regulated platforms where consistency and traceability are critical.
- Reduces the need for manual maintenance of hundreds of tests due to the use of model-based and property-based testing (i.e. seeing the GUI under test as a number of rule-based properties).

Our combined approach can capture the behavioural intent of 'example-based' scenarios (BDD or similar test assets), while enabling scalable, robust automation and comprehensive, traceable coverage.

If you are using Playwright or similar tools as part of your test implementation, reach out to us at ***info@exactpro.com*** to find out how you can improve software quality while accelerating delivery.



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th2-Loader
Enterprise-grade load, performance and resilience testing for financial systems

th2-Loader (aka th2-shark) is a high-performance load and simulation platform for mission-critical financial market infrastructures. Built for environments where microseconds matter and failures have a systemic effect, th2-Loader goes far beyond traditional performance testing tools. It enables organisations to detect capacity, resilience, correctness and recovery defects in trading, market data distribution, post-trade and web-based systems – as well as across systems – under realistic and extreme conditions and complex load scenarios and scenarios.

Testing modes:

- load generation via multiple protocols
- client and server simulation
- event-driven load test scenarios
- post-execution data analysis and reconciliation
- test or production data replay
- functional testing

Advanced Load Control & Fault Testing

- ☑ Platform-agnostic within the financial domain and applicable to other domains, following additional customisation.
- ☑ Thousands of simultaneous client connections or server simulation, high-rate transaction stress, bandwidth and latency measurement.
- ☑ Configurable load shapes and messages mix per connection or group.
- ☑ Dynamic on-the-fly load changes during execution.
- ☑ Support for failover and fault-tolerance testing.
- ☑ Built-in reconciliation features across multiple data streams and systems.
- ☑ Support of a variety of financial and general protocols and APIs.
- ☑ GUI testing capabilities.
- ☑ Real-time exposure of general and custom metrics into a monitoring solution.
- ☑ Dynamic reporting capabilities for internal and regulatory compliance purposes.

th2-Loader enables advanced capabilities for generating enterprise-grade loads alongside easy adoption across non-functional testing teams. It can be on-prem- or cloud-hosted and does not require high-end hardware for massive load testing.

INNOVATE WITH AI TESTING

Enhancing the quality of banking technology platforms through a hybrid AI Testing approach



Iosif Itkin
CEO & co-Founder,
Exactpro



Elena Treshcheva
Program Manager,
Exactpro

In the dynamic landscape of the banking sector marked by increased operational complexity and regulatory scrutiny, the pursuit of innovation demands a strategic approach. While offering enhancements in cost, quality and speed, it should mandate a cautious consideration of the risks inherent in the integration of emerging technologies. With the continuous advancement of artificial intelligence (AI), particularly, generative AI (GenAI) – as a method for improving process automation and streamlining dataflows and customer onboarding, among other use cases – its wider adoption in the financial industry demands careful consideration of the associated risk implications.

On top of regulatory compliance, aspects such as ethical considerations, potential biases, and the need for human oversight remain critical in AI-driven product development and testing. This paper* advocates for a software testing approach capable of addressing the complexities of banking technology platforms. Rooted in the principles of model-based testing, the proposed approach leverages GenAI algorithms to achieve extensive test coverage of the distributed systems and simultaneously employs rule-based analytics to refine the generated datasets, optimising coverage for faster test library execution and efficient resource utilisation. Such an approach is in line with a risk-averse innovation strategy, as it balances the smart creativity with more deterministic discriminative mechanisms.

Following the proposed approach, banking technology operators get to innovate, while learning about potential issues persisting in their systems faster and mitigating risks better, making timely and informed release decisions.

*Research published initially and copyright reserved by Henry Stewart Publications LLP

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Trading technology testing

CASE STUDIES

EXACTPRO – JSE COLLABORATION TO TEST THE MILLENNIUM EXCHANGE™ PLATFORM

The case study highlights the Exactpro deliverables in setting up automated functional and non-functional testing of the Millennium Exchange™ trading platform provided to the Johannesburg Stock Exchange (JSE) by LSEG Technology.

ATHENS STOCK EXCHANGE (ATHEX) TRADING SYSTEM FIX MIGRATION

OASIS Upgrade Testing & Coverage Analysis

The case study is a reference use case for supporting trading system migrations to FIX-enabled technology, it also highlights the role of passive testing approaches in performing and automating regression testing and improving test coverage.

MEMX – EXACTPRO COLLABORATION ON EXCHANGE QUALITY ASSURANCE

The case study reviews the extensive functional testing and test automation delivered by the Exactpro team.

MARKET SURVEILLANCE SYSTEMS TESTING

The case study highlights the challenges and the complexity of testing market surveillance systems connected to trading platforms, market data providers, involving various data mining processes, alerting mechanisms, and having different degrees of process distribution complexity. The case study is based on the experience of testing a number of market surveillance systems across different markets and locations.

MARKET DATA SYSTEMS TESTING

Recommended Practices for AI-enabled testing of market data, ticker plant, consolidated tape, Securities Information Processor and direct-feed solutions that handle market data from trading venues.

AI-ENABLED SOFTWARE TESTING FOR ARTEX MTF

The case study highlights Exactpro's AI Testing approach tailored to ARTEX needs and encompassing E2E functional and non-functional testing of the MTF's protocol and matching engine software.

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Post-trade technology testing

CASE STUDIES

POST TRADE SYSTEMS: FUNCTIONAL AND NON-FUNCTIONAL TESTING

The case study focuses on the Exactpro approach to testing large-scale post-trade infrastructures with emphasis on enhancing system resilience and increasing the level of process automation. The latter is achieved via using the latest data mining and machine learning techniques.

RISK MANAGEMENT

The case study focuses on the challenges of testing risk management systems and Exactpro's test automation and testing approach developed and implemented for our client, a central counterparty responsible for clearing and risk management of CCP-eligible transactions on a leading European exchange.

COLLATERAL MANAGEMENT

The case study features scenarios for testing collateral and liquidity management systems for a leading global rates and multi-asset clearinghouse and a multi-national central counterparty.

AUTOMATING CUSTOMER CONFORMANCE CERTIFICATION

Conformance certification (also known as conformance testing) is a mandatory step in ensuring that customer systems comply with the officially declared exchange/broker certification rules. The case study describes Exactpro's passive-testing-based solution for streamlining customer conformance testing automation.

AI TESTING: A STRATEGIC TESTING APPROACH FOR AN ISO 20022 MIGRATION

The case study elaborates on Exactpro's AI-enabled software testing capabilities for supporting the transition of banking and payment systems (including CBPR+) to ISO 20022.

BRIDGING INSTITUTIONAL-GRADE RELIABILITY AND ON-CHAIN AGILITY WITH COINCENTO

The case study demonstrates the main features of the Coincento solution that enables cross-network interoperability and efficiency across digital finance.

Capability building and support of AI Literacy obligations

Exactpro offers versatile learning opportunities that enable firms to boost their human potential and foster knowledge exchange and skills development within their teams. Participation in ISTQB®-accredited courses helps lay the foundational knowledge across the organisation and get teams ready for internationally recognised certification.

Our training courses include:

- knowledge transfer programmes for specific projects/goals
- software testing basics training
- AI Literacy training
- AI Testing training

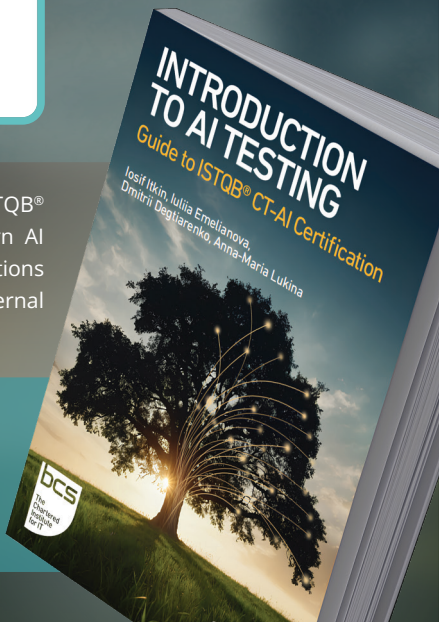
Participation in interactive workshops provides expertise in AI Testing via hands-on training covering relevant methodologies and tools.

Workshops upon request:

More workshops



Our recent book – Introduction to AI Testing: Guide to ISTQB® CT-AI Certification brings the clarity you need to govern AI responsibly. The book is a practical guide for organisations getting introduced to AI and starting to apply it in internal processes, including software testing.



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