



Testing as
a strategic enabler

For digitalization, automation,
and simplification in banking



About this report

This report has been produced by Wipro Ltd (NYSE: WIT), for a leading global bank, in partnership with Celent, a division of Oliver Wyman.

The global bank serves customers in retail, corporate and investment banking, with operations across US, Europe and Asia Pacific.

Celent is a leading financial research and advisory firm. Its thought-provoking content on the intersection of technology and banking/insurance/securities and investments has been guiding its diverse, global clients through the maze of financial technology disruptions for the past 15 years. Celent advises its client base about the disruption and change that financial technology firms, in concert with incumbent firms, can create across the financial verticals in which they operate.

This report is a result of a Strategic Innovation Day with the bank, Wipro and Celent. The goal of the Innovation Day was to leverage digitalization and automation to simplify and consolidate processes in the bank's global testing team, as it tactically implements the strategic goals.

This report highlights the power of collaboration between key partners and financial institutions

as they meet the challenges of today's capital markets. It looks at specific action items that came out of the Innovation Day and the tools and solutions that Wipro offers for meeting the needs of the bank's testing team.

The changing macro environment

Digital disruption continues to change the landscape of the financial markets. Regulatory and market structure change in the post-crisis world has put extraordinary pressure on the traditional operating models of global banks. Banks have been faced with weak global conditions — increased regulatory burdens that have remapped capital requirements and leverage ratios. This, in turn, has changed the ability of firms to generate revenues in the same fashion as before the crisis. All this is occurring in a macroeconomic environment that is increasingly difficult. The traditional investment bank and client relationship has been turned upside down in the post-crisis world.

At the same time, there is tremendous pressure to reduce the cost structure within banks. This path requires critical choices on where to compete, which clients to serve, what business lines to grow and which business lines to divest. It has also brought into view the high levels of complexity that are resident in technology architectures and business lines.



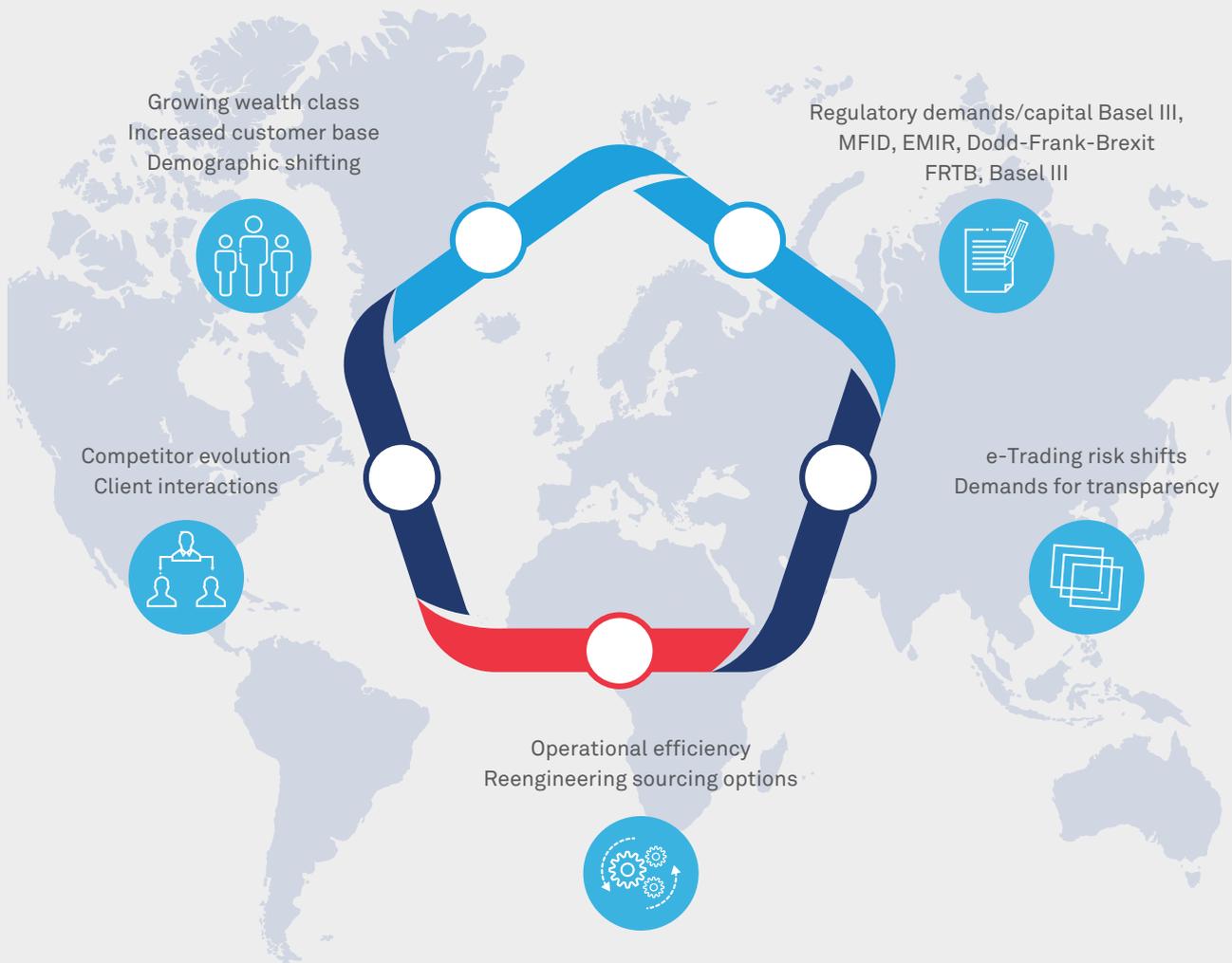


Figure 1 : The cycle of change is evident in the capital markets industry

Global banks have reacted in a variety of fashions to the challenges presented by the capital market business environment including new business models to allow them to compete as effectively as possible. A new world is forming in the capital markets; firms are looking at this world through a data-centric lens. In order to compete, firms are simplifying all the aspects of their internal and external touch points. Firms are striving to minimize complexity by moving from analog to digital models.

Firms are reinventing themselves through innovative business models and partnerships in order to operate nimbly in an increasingly

automated and digital business. A focus on data processes allows these firms to extract value from their data via cognitive AI tools. They are creating data-driven, replicable processes that are optimized on global scales across their entire infrastructure. These firms are innovating for simplicity through a collaborative approach to their global IT challenges.

In this report, we demonstrate a potential path for the global bank of tomorrow. The solutions described are built upon the three pervasive themes of digitalization, automation, and simplification.

Digitalization, automation, simplification

Digitalization

While digitization is focused on changing an asset from an analogue to digital form, digitalization goes much further — it is about applying customer and data-driven insights to radically transform the business. The digital global bank is built on the premise of leveraging resident data for insight, and prediction across business lines and user types. The data set has morphed to include not only traditional data, but also semistructured and unstructured data. The increase in data presents challenges and rewards. The multifaceted dimensions of data that can be leveraged present a unique opportunity to unleash a digital architecture that puts analytics and predictive intelligence, not just in the hands of data scientists, but all types of business users. This is a cultural shift that allows global solutions across a wide array of businesses and users. Collaborative intelligence will allow rapid transformation into automated solutions.

Digitalization is also about a new way of working. Co-located, multi-disciplinary teams work in collaboration to drive innovation across the lifecycle.

Automation

Banks are automating the heavily redundant processes that still exist within compliance, regulatory and operations into single workflows across their institutions. They are leveraging the wave of machine learning, cognitive computing and AI to continuously free staff to focus on value-added tasks while machines automate routine and replicable tasks.

Simplification

Banks are innovating for simplicity. Effectively optimizing processes across the value chain of bank businesses is a path to maximum

effectiveness. Firms that are burdened by heavy reliance on manual processes, or without the means to automate existing and new processes, are finding themselves at a disadvantage. Process design has an embedded path to automation. The speed of change is amplified in a world where information and capital travels fast. IT, operations and frontline business leaders require market intelligence and information tools to be able to predict the trajectory of their business.

The bank's strategy

In response to the profound shifts in the industry, the bank has embarked on an ambitious 3-5 year strategy. Focused on making the bank simpler, more efficient, less risky, better capitalized and better run, the strategy involves:

- Creating a new culture for greater effectiveness by maximizing human resources to minimize costs in order to compete in the ultra-competitive post-crisis world
- Refocusing core energies on the bank's strength — reducing the footprint in regions that are not conducive to high margin businesses. It requires tough decisions on which businesses to grow and which clients to serve
- Digitalizing the bank by automating manual processes to drive efficiency and control as well as fundamentally redesigning the way the bank interfaces and engages with its customers, across touchpoints
- Transforming the operating model to enable simpler, leaner operations
- Creating state of the art architecture that can be leveraged across bank business units
- Removing legacy systems to simplify global IT infrastructure to drive a culture that leverages data for maximum business effectiveness

Digitalization, automation, and simplification will play key roles in the strategy

The global testing and QA team is focused on implementing and achieving results to drive the firm's larger goals. The team is assessing its assets, people and tools. Moving forward with radical change is not easy. Remapping legacy IT and striving for a new architecture is not easy. Some of the challenges are listed below.

- Organizations spend 50% of their IT budget on application development, which on an average run 66% over budget and 33% over schedule.
- IT organizations typically spend more time testing, deploying, and releasing software than designing and building it.
- IT executives said they need to deliver faster for the pace of business.
- A high proportion of production incidents are a result of human errors in the manual release of software.
- IT development and IT operations have different values and ways of working that are often not in alignment.

Overcoming these challenges is a journey, and Wipro offered and presented its tool set and solutions that can be used to derive benefits in the short term, in terms of efficiency, and in the long term, to move toward its goal of automation and digitalization.

Innovation day

Digitalization and automation within core operations save the industry billions. The process of assessing the tools available to optimize results, the people that are available to achieve change, and assessing the state of a firm's assets are the path toward quick implementation. The goal is moving the firm forward to create the optimum culture to implement change and thereafter prepare the firm to accept rapid cycles of change.

The asks from QA are changing too. In traditional QA, time (whatever time remains after development is done), cost (as low as possible) and quality (got to be perfect out of the door) were the key asks. Today, digital channels are enabling enterprises to reach end consumers faster than ever with innovative products and services with experience at the core. Hence, in digital QA, speed (test as you build or even before), experience (for personalized and omnichannel experience), and iterative development (building a minimum viable product) are what both IT and business leaders are striving for.

Test automation is moving beyond regression to enable parallel development via progressive approaches. Behavior-driven development (BDD) methodology is one such approach where user expectation of behaviour in natural language constructs is the premise for automated testing. Enterprises are increasingly embracing Open Source tools and not-yet-established frameworks, and are open to experimentation more than ever. In tandem, skill requirements are evolving as well.

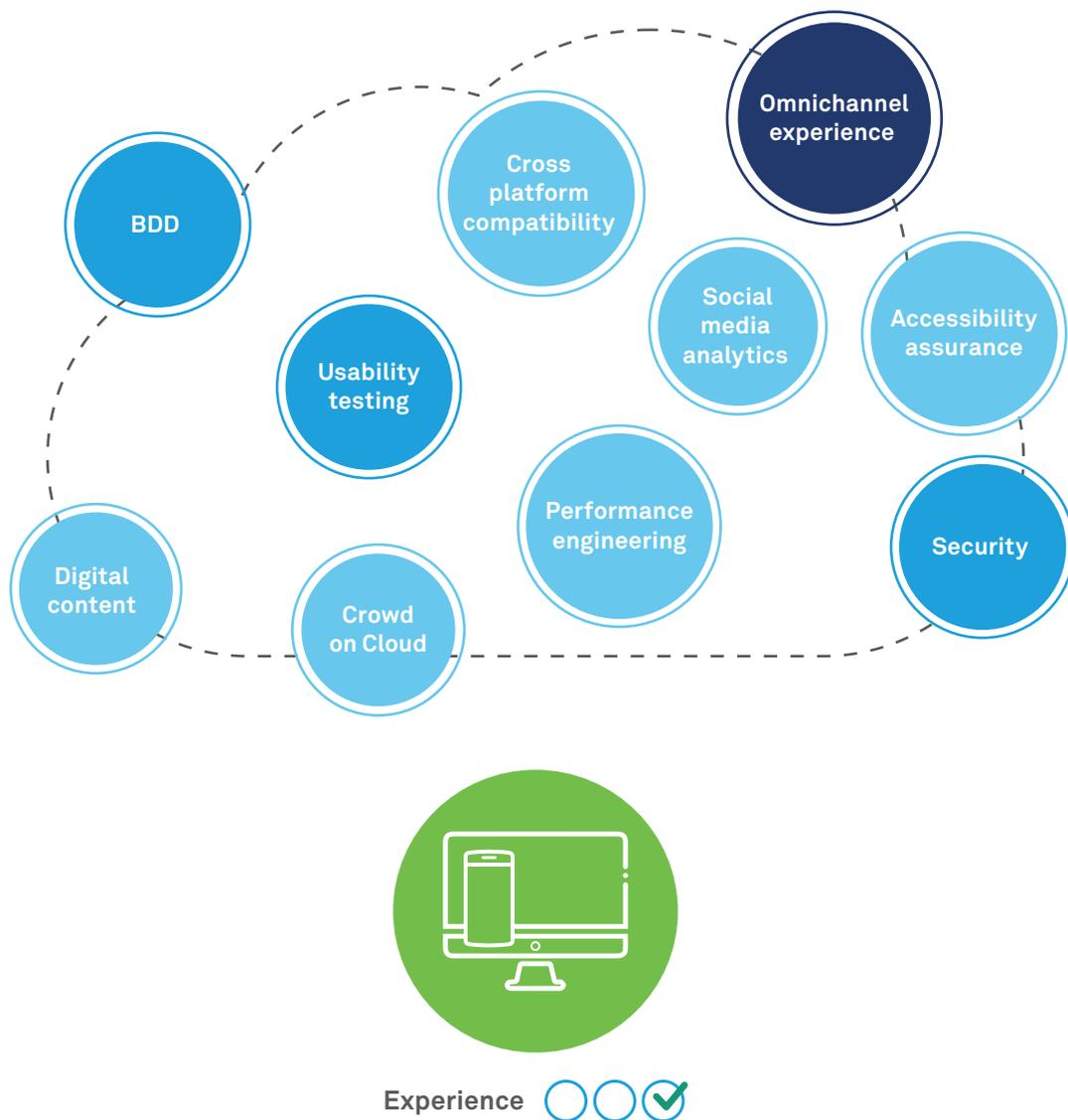


Figure 2 : Getting the experience right is everything

Creating a new culture that focuses on collaborating and optimizing services often requires different models for the holistic testing solution. A means of easing the continued transition to BDD and DevOps will bring leverage to firms using this path to collaborate and automate.

Tools are needed to better map, analyse, and draw meaningful insights and visualize, and create data-based solutions. A key theme is developing more rapid and efficient tools to automate the full spectrum of quality assurance (QA) for application development. Figure 4 illustrates one method to move to leverage innovation in the preparation and ingestion of data for visualization and prediction:

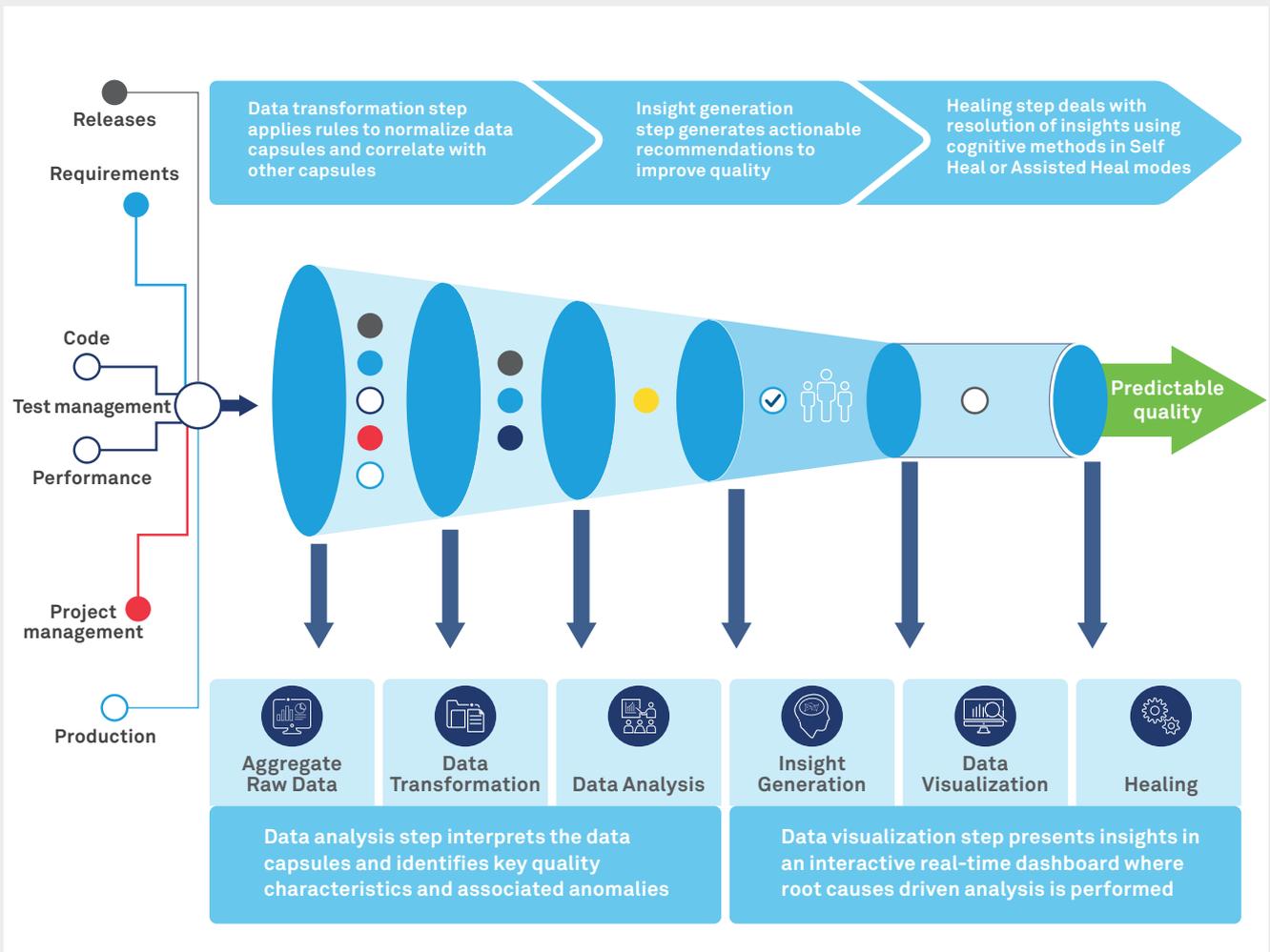


Figure 3 : Optimizing the lifecycle and getting to predictive quality

The need to process, analyse and gain intelligence from data is the defining activity of our age. Big Data has created a wealth of data that needs to be processed. The bulk of firms (88%) want to use their Big Data for predictive analytics. Firms that can build the analytical architecture to answer today's and tomorrow's questions will be the leaders of their space.

The explosion of data in the capital market has continued as the market has digitized. The multifaceted dimensions of data that can now be leveraged present a unique insight opportunity, but they do so at the cost of complexities in data curation, search distribution, normalization, processing and storage.

Concurrently, computing power and advanced statistical modeling have made artificial intelligence a nascent reality across the financial world. AI and cognitive solutions are now being employed and will be used to change the methods in which clients and partners interact, represent their knowledge set, leverage algo intelligence, learn and reason. Wipro's Holmes platform is an example of an AI platform that will bring exponential change to the financial industry.

Wipro has created a next-generation Intelligent Quality Platform that hosts a bouquet of machine learning and AI assets as applicable to QA and testing. It improves predictability in application

quality, increases automation, and drives better productivity. Ultimately, it results in IT wellness through predictive quality analytics, reduced

cost of quality, and a culture where every part of the organization thinks 'Quality First'.

Naturally interactive

Dialogue, natural language

Knowledge representation

Extraction form unstructured data

Learning/reasoning

Machine learning, common sense

Algorithmic intelligence

Stochastic modeling

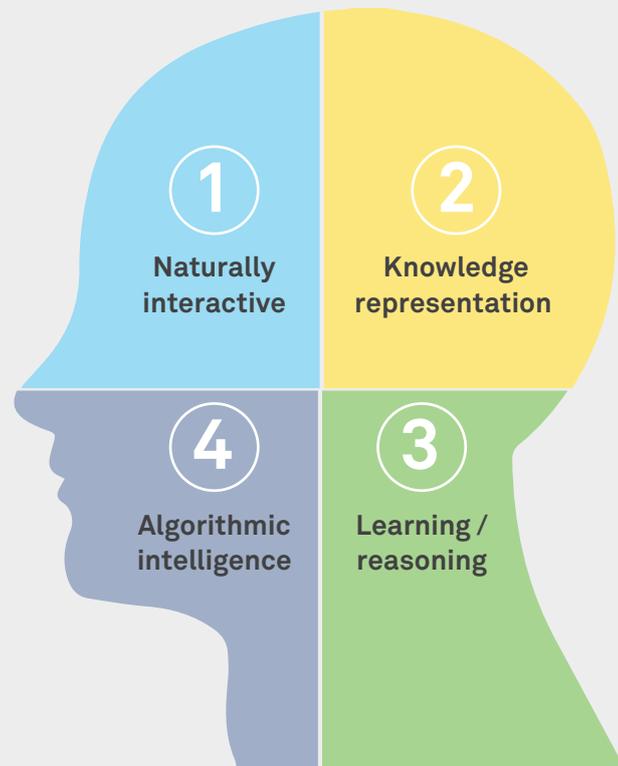


Figure 4 : Rise of the Machine: Artificial Intelligence and Analytics

AI will be a key component of task and process automation. Holmes is being piloted across the spectrum of operations in the capital markets with an eye toward exponential increases in efficiencies.

As part of the theme of complexity mitigation, tools are required to ease the automation process, rapidly design test cases and create a simpler means of creating regression analysis. Wipro's next-generation managed services QA delivery framework integrates best-in-class tools, IPs and best practices to address the needs of multi-speed enterprises implementing bimodal IT. By establishing a global partnership with Wipro, the co-creation of innovative solutions for digitalization, automation and simplification will drive the team's agenda and the bank's goals in the most rapid fashion. An example is Wipro's automation framework that serves as the foundation of the bank's global test automation standard.

Within QA, an entire mapping of the tools available, analytics, dashboards, reporting, and resource allocation needs to be managed centrally and offered in the most effective way possible across the lifecycle.

Quality as-a-service (QaaS) is another such tool to drive:

- On demand QA
- Project management
- Real-time QA analytics
- People management
- Estimation tools

Simplifying the testing lifecycle by integrating the full lifecycle of QA will accelerate go to market, maximize reliability, and drive return on investment.

Action items

Innovation Day wrapped up with a call for action, along the key themes of the day. The joint working groups, with members from the bank and Wipro teams, will focus on strategy and tactics in the move to increased digitalization, automation, and simplification.

Group 1

- **Digital transformation:** Continue to map out the way forward for the digitization of the bank. Work feasibility of some Proof of Concepts (PoCs).
- **Automation:** Strategy for implementing increased automation, as well as moving to a culture of BDD and DevOps with a focus on mobility.

Group 2

- **Tools and solutions:** The specific tools and solutions that Wipro can offer to the bank.
- **Security testing:** Supporting the creation of a Security Testing Framework (STF) to map across the bank's organization.

Anchors have been identified from both the bank and Wipro with an objective to work jointly and adopt the relevant tools and solutions across the bank to enhance the capabilities of the testing organization to meet its strategy.

Conclusion

Trends in digitalization will accelerate, and the challenge for established financial firms will be to find the correct means of collaborating with new business models and innovative technologies. Partnerships are growing and are key to creating value for internal and external clients in the challenging environment in which we all compete. Firms will continue to move to more digital, simpler and more automated models. Testing will move forward to leverage behavioural, business and technology changes to implement the bank's strategic goals. The joint working groups between Wipro and the

bank are immediately forming and working to implement testing strategy across the bank.

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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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