

Global Digital Wealth Management Report 2019-2020

Unlock New Future with Smart Transformation

Contents

Preface	1
1. Smart Transformation Propels Digital Wealth Management into a New Era	4
2. 2018 Recap: Smart Transformation Accelerates Worldwide	17
3. China Focus: The Pivotal Role Smart Solutions Will Play in Helping Balance Growth with Compliance in the Wealth Management Sector	29
4. Wealth Managers Must Acquire New Capabilities to Win in the Smart Era	36
5. Sustainable Development: How to Tackle Regulatory Challenges with a New Approach and New Tools	44

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Unlock New Future with Smart Transformation

Preface

The era of smart technology is officially upon us. With it comes an unprecedented overhaul to the finance industry marked by rapid customer intergenerational transformation, speedy adoption of new technology, and the ubiquity of financial services. With this momentous trend, smart technology innovation is bound to be one of the most important fields of development for global wealth management (WM) in the next 10 years.

- **Smart transformation brings new opportunities to the WM industry, with 50% investable assets from mass customers untapped, presenting huge market potential**

The year of 2018 saw the brink of a downturn for the global WM market, as its growth rate fell to the lowest level in the past 50 years. Nonetheless, through smart personalized advisory services and refined customer management, wealth managers (WMers) are rapidly extending their reach to the mass market and releasing customer potential therein. Consequently, a new wave of growth in WM is underway and it is entirely possible that we will witness births of new WM giants in this era. We project total assets under management (AuM) to increase by 25%-50%, total revenue to grow by 15%-30% and profit margins to expand by 25%-50% within the WM industry, driven by AI and other smart technologies.

- **Smart transformation is speeding up, with all players collectively thriving and regulatory technology prospering**

During the smart WM transformation, corporations should maximize their strengths in finding their appropriate positions within the ecosystem, and keep a healthy com-

petition to achieve co-existence and co-prosperity. Among these corporations, traditional financial institutions are breaking through institutional restraints through open cooperation and accelerating the implementation of smart applications. Financial technology (FinTech) firms are switching their mindset and strategies from 2C to 2B, participating in the development of specific fields of traditional financial institutions, and realizing the organic combination in more scenarios. Collectively as the bottom layer and infrastructure provider of the ecosystem, platform institutions are providing a fertile ground for innovations for small- and medium-sized WMers.

Meanwhile, the constant change in the global regulatory environment and the increasing compliance costs result in the rapid development of regulatory technology (RegTech). Apart from ensuring more efficient, agile, and comprehensive compliance in financial institutions, RegTech can also empower regulation systems to become more precise, professional, and transparent.

- **Admittedly, smart transformation exerts different impacts in different global markets. In China, it is the core driving force to propel the WM market to return to its fundamental purpose and leapfrog development**

In the US, smart transformation is deemed to be the trump card for creating competitive edges; while in Europe, it is an important part of the traction to reshape the current market landscape. The transformation of China's WM market began with the advent of the new asset management regulations, yet the market still faces a series of challenges such as the immaturity of investment concepts, an insufficiency of wealth allocation planning services for the majority of middle class customers, and unsophisticated institutional risk management. Smart technologies can solve these pain points in China by building a personalized content ecology to accelerate investor education, adopting robo-advisory to provide inclusive wealth planning services to alleviate "middle class anxiety", and strengthening the smart risk control system to achieve more robust comprehensive risk management, etc.

- **Smart transformation brings about new tasks for WMers: building an ecosystem of partnership, reimagining the customer journey and adopting analytics at scale**

Firstly, application scenario and data are the two pillars of smart transformation. By creating a new ecosystem and connecting application scenarios, institutions can consistently garner high-quality and multi-dimensional data. Secondly, institutions need to be truly customer-centric and wholly conduct re-creation of end-to-end customer journey to realize the true value of smart technology. Lastly, institutions need

to build a data-driven infrastructure to match the right talent with the right culture. Only then can an enterprise claim to have scalable smart application capabilities.

- **Application of smart technologies produces new challenges for regulators. We suggest that regulators keep an open mind and embrace the changes that data and technologies bring**

The acceleration of data and technological application has led to an exponential increase in market complexity and innovation patterns, which regulators nowadays need to confront. Given that the arrival of the era of smart technology is inevitable, the market demands a far-sighted and flexible regulatory system. This means that firstly, regulation positioning should be upgraded from reactive supervision to proactive guidance. While managing innovation risks, we should also cultivate a fertile ground for innovation. Secondly, regulators should adopt a sandbox mechanism to encourage the development and rapid iteration of innovative technologies with controllable risks. Thirdly, by shifting focus from rule-based regulatory approaches to data-driven ones, regulators should adapt to new business models and reduce compliance costs. Fourthly, regulators should be on the forefront of innovative technologies and put in significant energy to develop RegTech in order to build a professional, efficient, and accurate smart regulatory system.

1. Smart Transformation Propels Digital Wealth Management into a New Era

1.1 Wealth Management Embarks on the Smart Journey

The financial industry is currently experiencing enormous changes. Non-banks, who now provide financial services, have become an emerging force in the finance sector. Younger customers exhibit highly digitalized and personalized needs while fast-growing new technologies have made what was once fantasy a reality. Under the influence of these trends, the WM market is heading towards a fully smart era, underpinned by new technologies and data. WMers will thoroughly leverage FinTech to create a seamless digital experience in order to offer more professional and personalized WM services to a broader customer base than before.

Trend 1: Ubiquity of financial services

According to *Bank 4.0*¹, the dominant trend in the near future will be “banking everywhere but never at a bank”. Smart technology now enables transactions such as deposits, loans and remittances to be executed without needing to be physically at a bank branch or any financial institutions. Financial services in the smart era have adopted new forms and features.

- **Mobile channels have become the new battlefield:** customer preferences have changed drastically even in the past five years. Online channels, especially mobile ones, have become the main pathways to access banking services. Financial institutions are now serving customers outside of branches, creating a new battlefield for competition.
- **Customer needs have evolved to be unpredictable and highly personalized:** web/mobile-based transformations have driven customer needs to be more unpredictable and personalized. Demand for loan services is pushed earlier to the point of consumption. Accordingly, WM services need to cater to customer lifecycles and cash flow cycles. This new change implies that the demand for financial services could happen anytime, anywhere. Consequently, the sector needs to shift its mode from passively waiting for customers to proactively capturing real-time customer needs across different scenarios.

¹ King B. (2018). *Bank 4.0: Banking Everywhere, Never at a Bank*. Hoboken, NJ: Wiley.

- **Data have enabled more accurate customer profiling mechanisms:** integration of data lays the foundation for ubiquitous financial services. Data can be utilized to create holistic customer profiles and provide deeper insights into customers' needs. A "customer first" approach can come in handy for financial institutions that seek more comprehensive and richer data to better serve their customers.

Trend 2: Evolution of the customer base

Digitally savvy millennials² and digital natives³ have now entered the WM market and become a principal target for WMers. Born in the digital age, they have both different expectations and needs for financial services than their forbearers.

- **Rely on mobile devices:** millennials grew up alongside the Internet and mobile phones. In China, nearly all millennials use mobile payment tools, while only half of customers aged over 50 use them⁴. The first credit payment tool used by many young people is no longer a credit card, but the credit service Huabei, which is tied to their Alipay and Taobao accounts.
- **Put trust in technology first, then in licenses:** According to a joint survey by Lufax and iResearch in 2019⁵, millennials account for 83% of smart WM customers. They grew up with tech companies and witnessed the great changes and impacts technological innovations have brought to their communities. This affinity leads them to trust tech companies, while paying less attention to which types of licenses financial institutions hold or whether these institutions are state-owned.
- **Pursue faster and smoother experiences:** millennials use mobile apps to access financial services, and tend to compare experiences provided by financial institutions with those provided by tech companies. Unlike previous generations who focused solely on metrics like returns, investment horizons, or investment risks, millennials also pay attention to the consultation process, ease of purchase, and after-sales interactions.

Trend 3: Rapid implementation of new technologies

In 2016, Gartner's *Hype Cycle* enumerated five stages in which a new technology evolves as

² Millennials: usually refer to post-80s and post-90s.

³ Digital natives: usually refer to post-00s, born in a digital age.

⁴ Source: a February 2018 survey with about 2,100 samples, among which offline samples account for 50%.

⁵ Source: *Smart Wealth Management 4.0: 2019 Global Smart Wealth Management Services White Paper* jointly released by Lufax and iResearch, which uses an online survey sample size of, 1317.

(1) innovation trigger, (2) peak of inflated expectations, (3) trough of disillusionment, (4) slope of enlightenment, and (5) plateau of productivity. Gartner also commented that artificial intelligence (AI) and blockchain were in the innovation trigger stage, while big data and cloud computing were in the trough of disillusionment stage. However, three years later, these technologies are maturing much faster than expected.

- **Cloud computing and big data analytics have reached maturity:** big data analytics has driven customer profiling, targeted digital marketing and better lead generation in the front end. Integrated data and exceptionally strong computing power also enable more comprehensive risk management and timely alerts at multiple levels of the middle end. The rapid adoption of cloud computing also allows the back end to respond to concurrent requests more flexibly and at a more reasonable cost.
- **AI has evolved from experimental phase to real application:** the number of job openings requiring deep learning skills increased 35 times⁶ from 2015 to 2017. AI will reshape the entire financial industry value chain, powering more accurate assessments of customers, better real-time and lifecycle management of products and portfolios, personalized smart advisory services, and an overall more satisfying customer WM experience.
- **Augmented Reality (AR) and Virtual Reality (VR) have entered the early stage of application:** VR/AR can also bring about a new and exciting customer experience, improving the interaction between WMers and clients. For example, in order to raise awareness of pension planning, Fidelity Labs uses VR technology to help their customers experience their possible future life through a virtual scenario, demonstrating the tangible impact of what different saving rate plans could make in the years to come.
- **Blockchain technology has been put into practice in many areas:** the value of blockchain-related venture capital financing grew rapidly from less than \$1 billion in 2017 to \$3 billion in 2018⁷. As a database that uses linked individual digital records to store and process information, blockchain protects clients' personal information from tampering or loss and ensures more transparent, accurate and credible Know Your Client (KYC)'s information.

Smart transformation is no longer a marketing stunt or simply theory, but the most important route forward for global WM in the next decade. **The traditional WM model**

⁶Source: joint report by Stanford University, MIT, Harvard University, etc., *AI Index 2018 Annual Report*.

⁷Source: an April 2019 report by BCG, *Capturing the Value of Blockchain*.

with offline branches is facing enormous challenges, and WMers must embrace a new market environment, new technologies, and new customers. They should use data to integrate customer information across various use cases, utilize applications such as AI and other digital tools to replace traditional manual work, and collaborate with other WMers to share and co-develop products and technology. Consequently, they can derive more accurate customer insights and thus provide more tailored products and services.

1.2 An Inclusive Expansion of Wealth Management, Fueled by Smarter Solutions

Global wealth management market slows while Mass Affluent segment searches for new opportunities

According to the *2018 BCG Global Wealth Management Report*, although the overall market totaled more than \$20.5 billion, the growth has slowed down, and it was expected that the market would grow at a modest average annual rate of 5.7% in the subsequent five years. In mature markets⁸, the growth rate of the incremental AuM had slumped into negative territory at -0.7%. There was also a 4bps drop in return on AuM between 2014 and 2018⁹.

Consequently, the WM market needs a new source of growth, and the so-called “Mass Affluent”¹⁰ segment possesses significant potential. First, most people in this segment have half of their assets stored in cash or savings accounts, which are currently untapped by WMers. Moreover, the Mass Affluent segment accounted for only 17% of total AuM, yet contributed 27% of the overall WM revenue, indicating a higher return per unit asset¹¹. (See Exhibit 1.) Therefore, we believe the Mass Affluent market represents the biggest opportunity for WMers in the next decade.

Smart transformations bring opportunity to achieve all-inclusive wealth management

Smart advisory services with personalized offerings can now reach the Mass Affluent: in the past, hamstrung by a high cost customer service model, traditional WMers tended to focus chiefly on the High Net Worth (HNW) segment, whereas the Mass Affluent could not get access to customized service without paying excessive fees. However, smart

⁸ Incl. North America and West Europe markets.

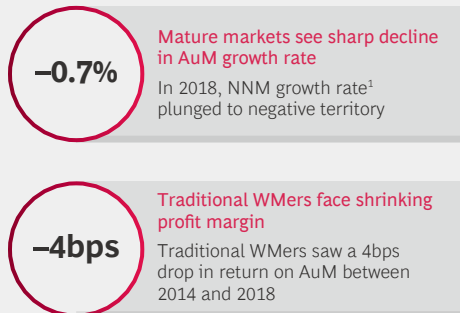
⁹ Source: *2019 BCG Global Wealth Management Report: Reigniting Radical Growth*.

¹⁰ Mass Affluent: households with investable financial assets under \$1 million; the same below.

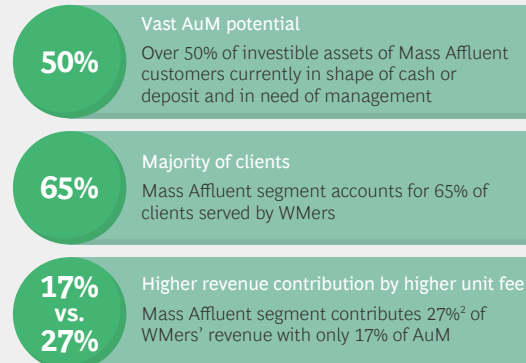
¹¹ Source: *2019 BCG Global Wealth Management Report: Reigniting Radical Growth*.

EXHIBIT 1 | Smart Transformation Enables Rapid Market Growth — Mass Affluent Segment Brings Significant Potentials

Global WM market stumbles in 2018



Mass Affluent presents great opportunities



Sources: 2019 BCG Global Wealth Management Report; Literature research; BCG analysis.

¹Percentage of Net New Money over total AuM.

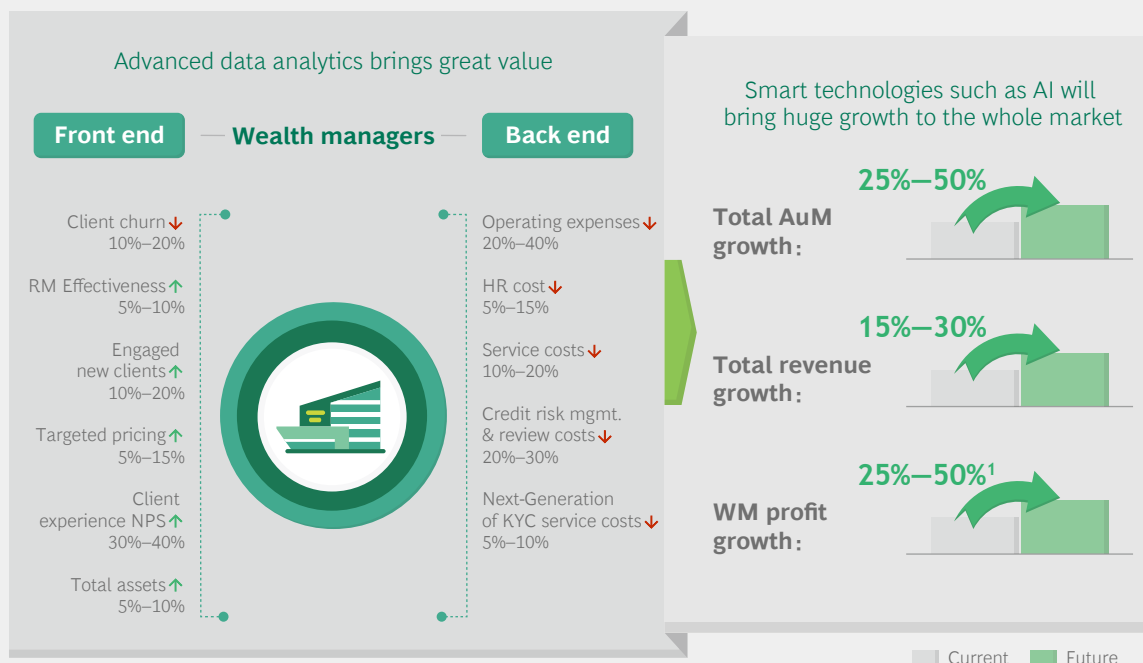
²A BCG global study shows that the Mass Affluent segment pays a higher unit rate for investment advisory services than HNW segment due to lower price sensitivity and lower AuM scale individual customer contributed.

WM will soon disrupt the current business model by reshaping middle and back end operations, reducing service costs and enabling the Mass Affluent to have access to professional WM services. As shown in Exhibit 2, big data analytics can reduce customer service costs by 10%-20%, and operational costs by 20%-40%. In recent years, many overseas FinTechs and even traditional WMers have launched robo-advisory services for the Mass Affluent, and their investment management fee has dropped from around 1% to 0.25%-0.5%. At the same time, investment threshold is now reduced to \$5,000, or sometimes even less.

Refined customer engagement: in the past, digital tools were often criticized to be cold and not human friendly. Now, however, by making use of the greater knowledge of the customer derived from data collection, AI can interact in a way customers prefer. Digital tools are now perceived as considerate and personal. Thanks to this, professional WMers can regain customers' trust of their assets.

In conclusion, the role of smart transformation is not to simply redistribute profits in a zero-sum game, nor is it to reduce costs, but rather to extend the reach of the market significantly for all participants, creating a win-win situation. As a result, more customers will be attracted to professional WM services, more needs will be met, more satisfied customers will come back to the WMers, thereby creating a virtuous circle. We estimate that smart technology, AI in particular, can bring about total AuM growth of 25%-50% and total revenue growth of 15%-30% for the entire WM market. Moreover, the efficiency and effectiveness of WMers will also be improved, leading to an estimated improvement in profits of 25%-50%. (See Exhibit 2.)

EXHIBIT 2 | BCG Estimates that Smart Technology Would Bring Real Value to WMers, Leading to Huge Growth for the Entire WM Market



Sources: 2018 BCG Global Wealth Management Report; Literature research; BCG analysis.

¹According to estimation, RoCAL (Return on Client Assets and Liabilities) will be increased by 7-12bps, which equals 25-50% increase in WM profit margin.

Seize the opportunity: the next generation of digital wealth management giants will be supported by the Mass Affluent

We believe that the next generation WM powerhouses will need to seize the opportunity presented by millennials and the Mass Affluent, and then defend their positions by smart transformation in the front, middle and back ends. Both FinTechs and traditional WMers have been actively exploring the opportunity and extending their reach to millennials and the Mass Affluent.

FinTechs: a great number of new WMers and FinTechs targeting the Mass Affluent and younger clients have emerged. From 2013 to 2018, WM-related equity funding grew from \$245 million to more than \$1 billion, representing four and a half times growth¹². In the US, for example, Betterment and Wealthfront, without a single brick-and-mortar branch, have attracted Mass Affluent customers who need online access and convenience. They have accumulated \$10 billion in AuM in only a few years' time. In China, Ant Fortune,

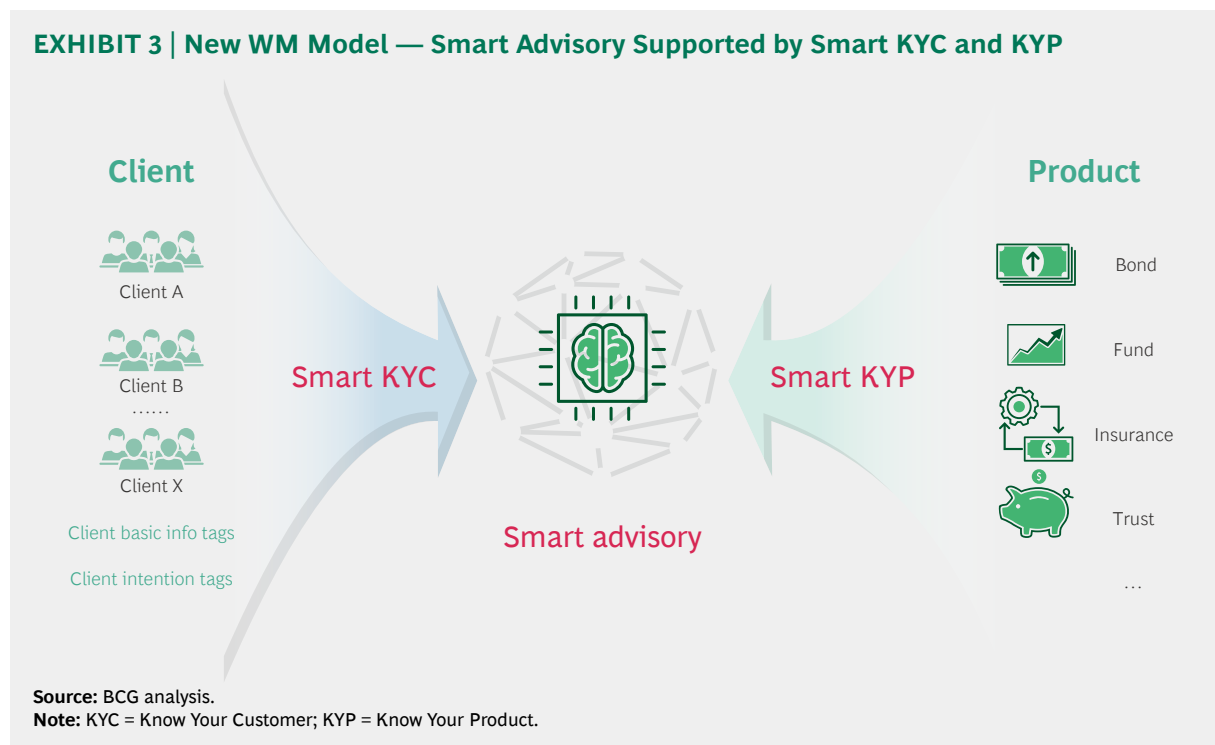
¹² Source: BCG FinTech Control Tower, equity funding includes only WM-related FinTech companies.

Lufax, and other similar organizations have extended first-rate online and mobile capabilities. They have accurately captured the key needs of the Mass Affluent by offering better investor education, scenario-based marketing, and robo-advisory services.

Established WMers: a large portion of established WMers are also paying more attention to business opportunities presented by the young and the Mass Affluent. In February 2019, Morgan Stanley acquired Solium Capital, an employee equity management agency, with the hope that Solium would help it gain access to young customers with high potentials. In mid-2019, Goldman Sachs also announced the launch of robo-advisory services on Marcus, its retail digital platform, to provide service to the US Mass Affluent with assets of \$100,000 – \$1 million. Goldman Sachs has also acquired United Capital, an investment consulting firm specifically catering to the Mass Affluent, further underlining its commitment to this market.

1.3 A Paradigm Shift and Value Readjustment Toward Personalization

The core service model of the WM is to find the right products for the right customers. Smart transformation makes the match more convenient, accurate, and personalized, enabling a smarter WM model and adding value through reaching new client segments and providing full customer lifecycle service. (See Exhibit 3.)



Smart KYC: data-driven personalization

Tailored offerings need to be based on specific and thorough understanding of customers. **Customer service in a smarter era not only needs to improve the quality, but also leverage the interactive approach and timescale more accurately than before.** To this end, WMers will need to leverage the new and smart resources at their disposal, including big data and AI, in order to upgrade from the static understanding of customers to dynamic prediction of their intentions.

- Lufax has launched a customer profiling system with KYC (Know Your Customer) and KYI (Know Your Intention) at its core. It includes a KYC labeling system and a predictive KYI model. The KYC labeling system aims to periodically update tags covering customer transaction history, consumption characteristics, and psychological traits. The KYI model, with a 100,000-neuron network at the base of the platform, accumulates and analyzes five categories of customer data: short-term behavior, long-term behavior, product preference, service preference, and habits when using the platform – all in real time. Sound customer KYI, with the help of AI, would make real-time identification of customer intentions¹³ a possibility. (See Exhibit 4.)

Smart KYP: end-to-end lifecycle management

In addition to comprehensively understanding customers, WMers also need sound judgment about products. Complete end-to-end management of products from investment research and market analysis perspectives, product evaluation system, and lifecycle tracking is made easier with the following tools:

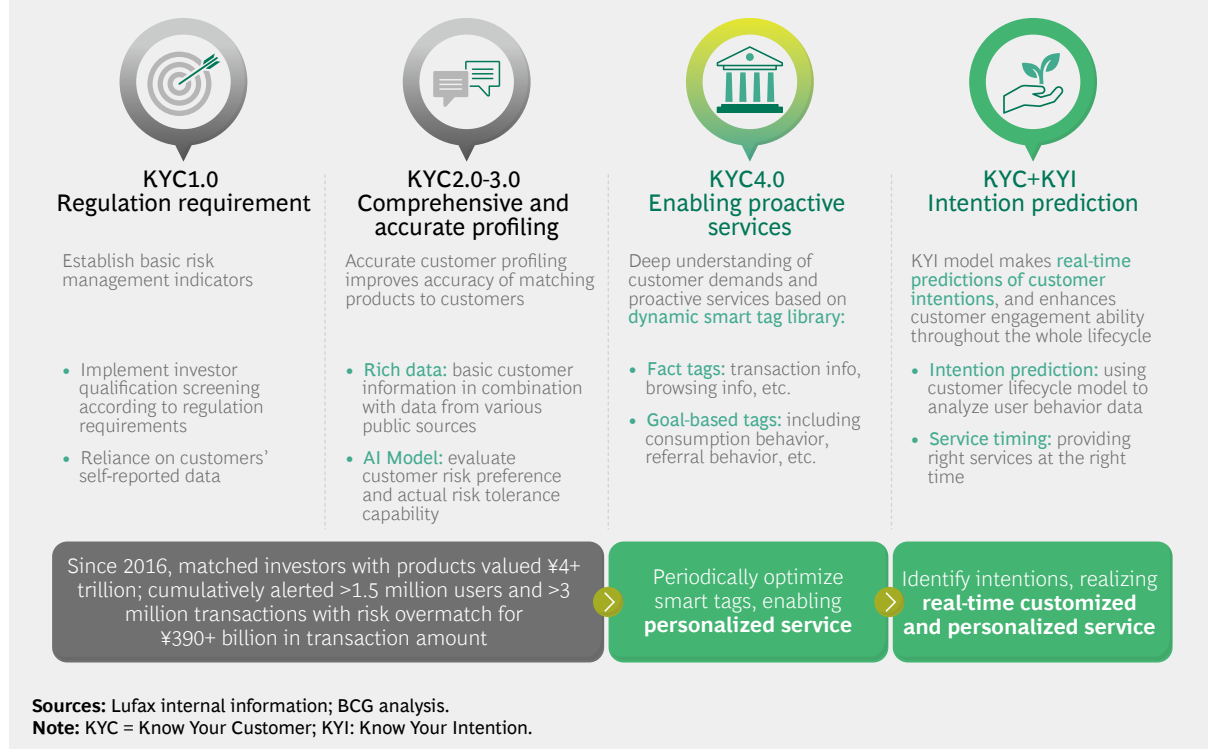
Firstly, smart investment research based on in-depth market insight: AI can provide faster, more detailed, and comprehensive investment research than humans can possibly fathom. Using pattern recognition and machine learning, AI-based investment research can now attain deeper insights into a specific industry and its underlying assets.

- Morgan Stanley used AI to study more than 41,000 research reports published in the past six years, and built a smart analytics model that helped analysts to generate a score on the likely performance of a particular stock. During this process, the model used a deep learning approach to judge each sentence of the reports, gauging the dispositions of the writers, in order to achieve full comprehension. Statistics show that top-rated stocks by the model outperformed the worst ones by 9.6%¹⁴ on average.

¹³ Source: Lufax internal information.

¹⁴ Source: Morgan Stanley 2019 public data.

EXHIBIT 4 | Lufax is Upgrading its KYC System Continuously, to Match the Right Products with the Right Customers at the Right Time



Secondly, a product evaluation system based on comprehensive market information: Leveraging big data, AI and other new technologies to integrate information, asset and people, smart transformation can build a label-based product assessment system for WMers to better match proper products with the right customers, based on both product and fund manager.

- Japan's Government Pension Investment Fund (GPIF)¹⁵, the world's largest pool of retirement savings, and Sony Computer Science Laboratories have jointly developed an AI system that enables GPIF to closely monitor the behavior of fund managers and detect stylistic idiosyncrasies that may signal potential investment errors or even possible misconduct. The system also helps to ensure that fund managers would adhere to their fiduciary duties to investors.

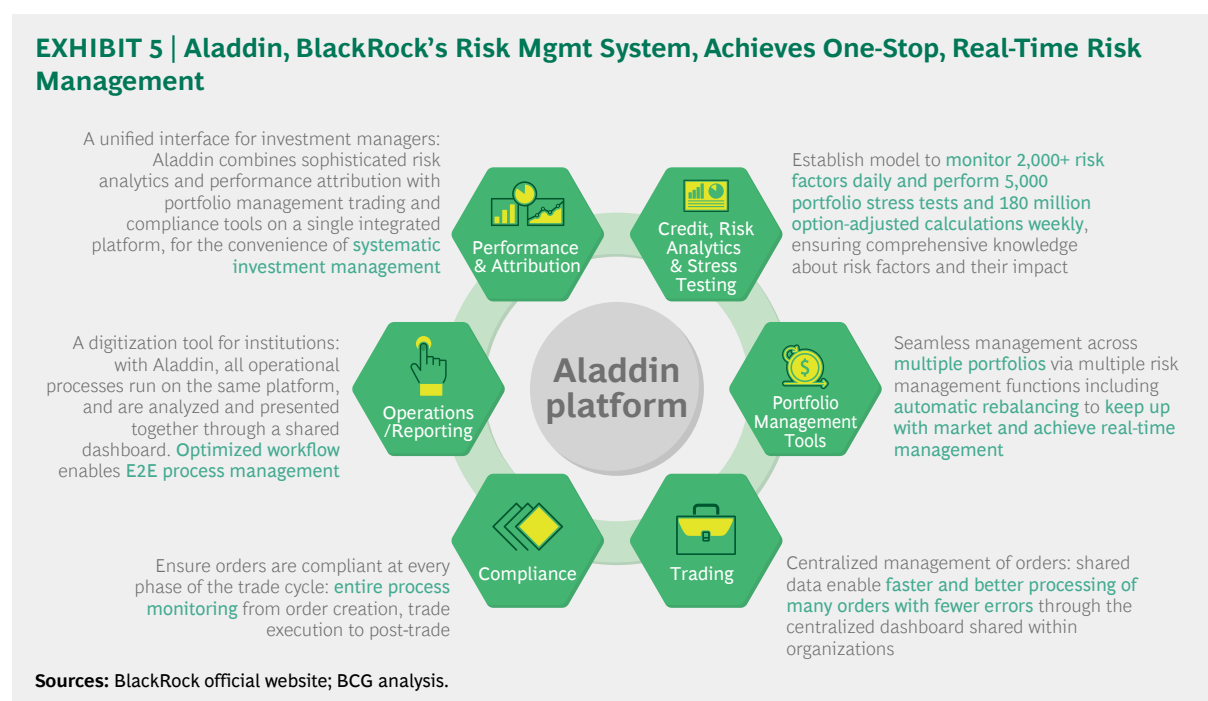
Thirdly, a real-time product lifecycle tracking system: smart transformation enables product lifecycle management in two ways, multi-dimensional cross validation and ongoing dynamic tracking. The former monitors the product from a variety of perspectives,

¹⁵ Source: a study on *the Use of Artificial Intelligence within Government Pension Investment Fund's Investment Management Practices* report published by Sony in 2018.

including compliance policy, macro market trends and underlying assets. The latter tracks market dynamics 24/7, conducts real-time performance analysis, and gives warnings, if necessary.

- Aladdin, a risk management system developed by asset manager BlackRock, monitors over 2,000 risk factors each day, executes 5,000 portfolio stress tests and makes 180 million option-adjusted calculations each week¹⁶. Aladdin can also simulate the risks an investment portfolio may face in different scenarios, answering questions like “How will inflation affect my portfolio?” Furthermore, it helps investors adjust portfolios based on changes in correlation in a timely manner. (See Exhibit 5.)

EXHIBIT 5 | Aladdin, BlackRock's Risk Mgmt System, Achieves One-Stop, Real-Time Risk Management

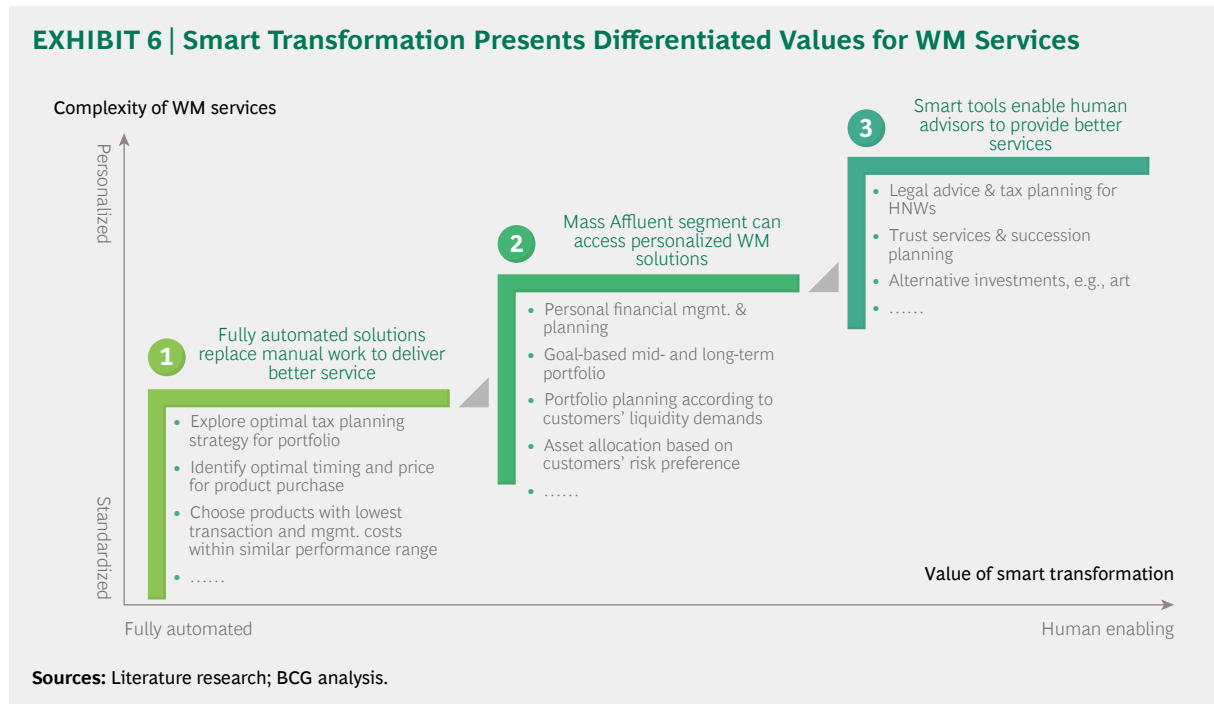


Smart advisor: smart transformation opens up a new era for wealth management service

WM service in the smart era does not mean human advisors will be completely replaced by robo-advisors. Rather, a customized WM service offers tailored products, and uses big data and AI to analyze customer assets, risk appetite, and life stage. WM services may also include wealth preservation, tax management, and asset allocation planning. As shown in Exhibit 6, we categorize WM services based on complexity in order to find the differentiated value that smart transformation can bring to different operations. The result shows

¹⁶ Source: data from official website of BlackRock.

EXHIBIT 6 | Smart Transformation Presents Differentiated Values for WM Services



that for rule-based operations, replacement of humans by AI does yield better results. For WM and financial planning for the Mass Affluent, an algorithm-powered robo-advisory service could provide goal-based solutions at lower costs. For more complex WM demands such as tax and succession planning for HNW individuals, smart tools can empower human advisors with better capabilities and efficiency.

- **Automation replaces humans for better results:** for rule-based operations, such as seeking the lowest-rated products, best trading prices, and most tax efficient options, AI system and tools can completely replace human labor and deliver better results. For example, in 2017, J.P. Morgan launched a smart trading robot known as “LOXM”, which uses deep learning techniques to assess historical data generated from both real and demo trading, and then determines the best trades and execution. Betterment has adopted a tax-coordinated portfolio that improves after-tax returns by 0.48% per annum¹⁷. Traditional advisors usually adjust portfolio positions once per quarter or every half year, but a smart advisor can perform real-time position adjustment and portfolio re-balancing.
- **Smart and personalized wealth management services are cost-efficient:** smart offerings can significantly reduce service costs, reach more people, and meet their

¹⁷ Source: data from official website of Betterment; if the portfolio is at loss, the uplift effect of tax coordinated return will be more significant, standing at 0.77% per annum.

EXHIBIT 7 | Betterment Sets Six Investment Objectives

	Objectives	Description
1	Retirement Savings	For those saving for retirement
2	Retirement Income	For retirees making withdrawals
3	Safety Net	For growing an emergency fund
4	Major Purchase	For making a future expenditure
5	General Investing	For investing when you're not sure of the specific future expenditure
6	Smart Saver	For investing when you have extra cash for low-risk portfolio that yields income through bonds

Sources: Betterment official website; BCG analysis.

needs better with real-time and customized investments. Smart WM services can tailor a financial management plan for each family member according to income level, target consumption, lifestyle, and stage of life. For example, Betterment customized customer portfolios are based on six investment objectives. (See Exhibit 7.) In this sense, robo-advisory allows every family to have its own personal chief investment officer.

- Smart transformations that complement and enhance human labor:** for more complex demands involving alternative investments, wealth succession planning, trust services, etc., smart tools cannot fully replace human labor, but can assist humans in areas such as data analysis, real-time information acquisition and digitalized customer interaction to achieve better results. For instance, in 2018, BNP Paribas Fortis acquired a 25% stake in GuiSquare to help finance the development of PaxFamilia, an online WM tool designed for private banking customers and relationship managers. PaxFamilia assisted relationship managers with not only routine tasks like report generation and financial planning advice, but also more complex operations such as collation of real estate data, P&L and cash flow analysis, and revenue scenario analysis. In the future, BNP Paribas Fortis hopes PaxFamilia will be able to use APIs to expand its scope of services to other areas, such as wealth succession planning and legal advisory.

1.4 Challenges for Institutions and Regulators in the Smarter New Era

To sum up, smart transformation will inevitably reshape the WM industry in the next ten

years. Although new technologies and service models will create new business opportunities, they also pose new challenges for both WMers and regulators.

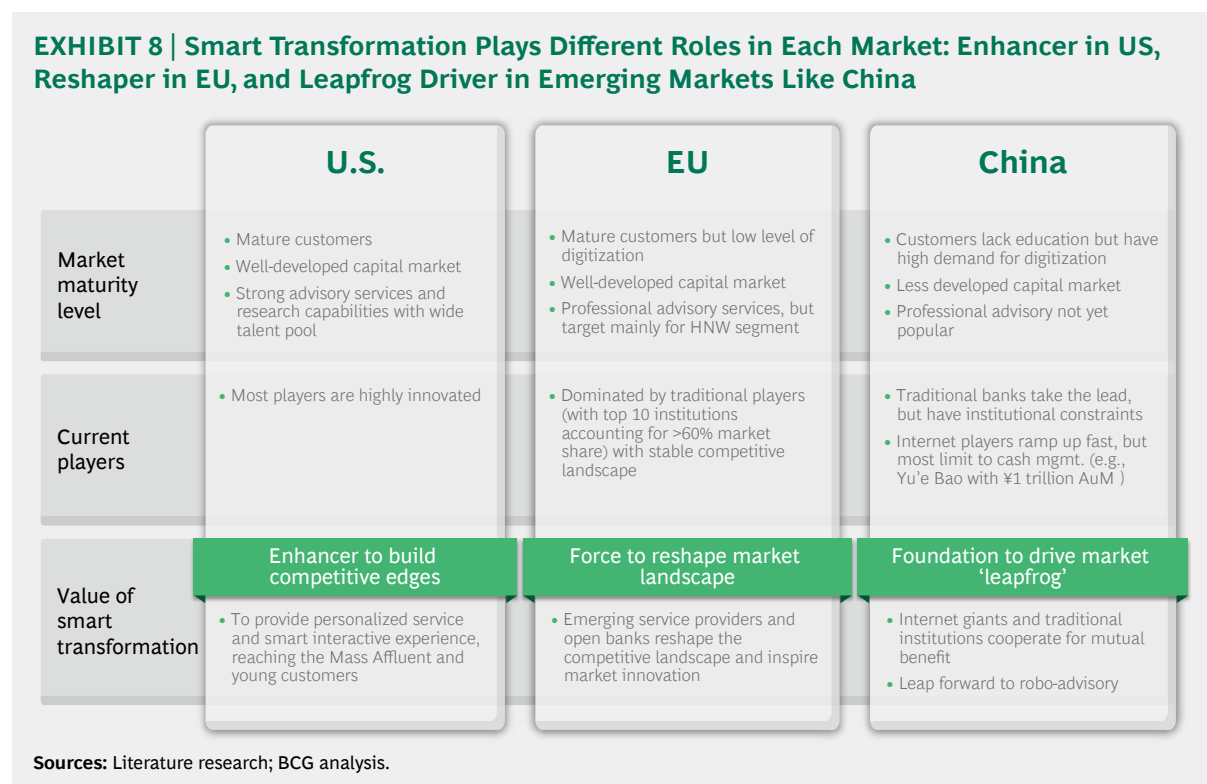
Smart technology transformation is the key for WMers to stay ahead of the competition, but the challenge lies in identifying the right place for each player in the market, and then accordingly developing necessary smart capabilities to support that transformation. Firstly, data and use cases are the cornerstones of smart wealth management. It is important to create an open and collaborative environment, build and connect use cases, and accumulate high quality and multi-dimensional data from a wide variety of sources. Secondly, WMers would need to implement an improved customer journey, which will not only cut costs but at the same time put customers' needs and experience at the heart of the business. Lastly, organizational restructuring is an indispensable tool for implementing smart transformation. Each WMer should explore the fittest way to change its operating model, organizational and talent structure, and build an open and data-driven corporate culture.

Regulators face different challenges as well. On one hand, smart transformation can improve the efficiency of the WM industry and the rapid development of RegTech enables regulators to reduce errors and increase transparency. On the other hand, smart technologies also introduce new risks and challenges into the market, including data security, privacy breaches, interpretability, accountability ambiguity of AI algorithms, and tech-generated fraud. **Tasked with managing the ever-changing market environment and the unprecedented technology revolution, regulators might need to reconsider their positioning, regulatory logic, and methodology. Whether to be the observer and supervisor, or to be the enabler or even the leader of innovation, is the new question with which they are now faced.**

Now, hopefully you can find the answers to tackle the above challenges in the rest of this report.

2. 2018 Recap: Smart Transformation Accelerates Worldwide

2.1 Case Studies: Smart Transformations in Three Key Global Regions



2.1.1 US: Smart Transformation as an Enhancer to Build Competitive Edge

The US is one of the world's most mature WM markets. The large number of wealthy customers and the largest amount of wealth in the world have promoted the development of WM market in both breadth and depth. Firstly, investors are knowledgeable about financial markets and are used to looking at investment in terms of long-term goals such as pension planning and child education. Secondly, the US capital market is well established for its diversified asset classes. For instance, at the end of 2019, over 5,000 stocks¹⁸ and around 2,000 exchange traded funds (ETFs)¹⁹ were listed and actively traded on the major exchanges. Thirdly, WMers have built mature service models that target HNW segment. Traditional WMers like UBS, Fidelity, and Bank of America

¹⁸ Source: 2018 Annual Report of NYSE and NASDAQ.

¹⁹ Source: a report by Statista, a German online statistics portal – *Number of Exchange Traded Funds (ETFs) in the United States*.

Merrill Lynch (BAML) all have a large number of professional investment advisors. At the end of 2018, BAML had nearly 20,000 and UBS had more than 10,000²⁰. Charles Schwab's online WM platform attracted more than 7,500 independent advisors²¹ to provide services to clients.

In a mature market like the US, favorable market conditions have also given rise to a large number of FinTech startups. According to BCG statistics, the total financing raised for US FinTechs from 2000 to 2017 accounted for over 60% of global FinTech volume²². Competition from emerging FinTech players has also forced traditional WMers to strengthen their technological capacity. For example, Goldman Sachs' technology talents now account for more than a third of its entire workforce. The firm spent nearly \$1 billion on technology in 2018, representing 2.8% of its operating revenue²³. Smart technologies and digital applications are recognized as core competitive edges by these institutions. Apart from improving advisory services and enhancing customer experience, the use of smart technologies is also a powerful tool to enable WMers to reach new client segments such as younger and emerging customers.

According to Statista, assets under robo-advisory management in the US reached \$750 billion in 2019, representing 76%²⁴ of total global volume. AuM of robo-advisory FinTechs like Betterment and Wealthfront exceeded \$10 billion in 2018. The key to successful robo-advisory WM is targeting the Mass Affluent Technology-Enabled (MATE) segment, which has been previously neglected by traditional players. People in this segment are generally 20-40 years old, with an average annual income of more than \$100,000. Most of them are engineers, doctors, lawyers and similar high-income earners with busy schedules and little time for investment decisions. In the US, there are around 15 million people in this segment with potential AuM of over \$500 billion, according to Betterment estimates²⁵. This segment has become a major battlefield for WM robo-service providers. In recent years, traditional large-scale WMers like Vanguard Group and Charles Schwab have grown their AuM of robo-advisory tremendously by virtue of their large customer bases and rich resources. Vanguard Personal Advisor Services, for example, has become the world's largest robo-advisory platform with over \$140 billion²⁶ in AuM. (See Exhibit 9.)

²⁰ Source: 2018 Annual Report of BAML and 2018 Annual Report of UBS.

²¹ Source: data from Charles Schwab official website.

²² Source: BCG FinTech Control Tower 2018.

²³ Source: 2018 Annual Report of Goldman Sachs, without labor cost.

²⁴ Source: a report by Statista, a German online statistics portal – *Personal Finance Report 2019*.

²⁵ Source: data from Betterment's study.

²⁶ Source: Morgan Stanley's *Robo-Evolution, One Year Later* in 2018.

EXHIBIT 9 | FinTechs and Traditional WMers are Building Smart Capabilities to Provide Smart Service – Taking Robo-Advisory as An Example

		AuM in 2018	Fee ¹	Launch time	Average account balances (est.)	# of customers	Covered markets	Service category	Trend
Robo-advisory companies	Betterment	~\$14B	0.25% — 0.4%	2010	~\$30K	~460K	U.S.	Hybrid	Independent robo-advisory companies lead technological development
	Wealthfront	~\$11B	0.25%	2011	~\$52K	~210K	U.S.	Purely digital	
	Personal Capital	~\$8B	0.49% — 0.89%	2011	~\$180K	~18K	U.S.	Hybrid	
	Wealthsimple	~\$2.2B	0.70%	2014	~\$23K	~23K	Canada, U.S., UK	Hybrid	
	SigFig	~\$500M	0.25%	2011	~\$46K	~11K	U.S.	Hybrid	
Traditional players	Vanguard	~\$140B	0.3%	2015	Threshold \$50K, well trusted by middle-aged & senior customers		U.S., Canada	Hybrid	Traditional WMers catch up through in-house development or acquisition, gradually taking lead in AuM scale
	Charles SCHWAB	~\$33B	0	2015	Low threshold (\$5,000) and no fees; attracting many new users		U.S.	Purely digital	
	TD Ameritrade-Essential Portfolio	~\$17B	0.3%	2017	Low threshold (\$5,000)		U.S.	Purely digital	
	FutureAdvisor (acquired by BlackRock in 2015)	~\$1.2B	0.50%	2010	Low threshold (\$5,000)		U.S.	Purely digital	

Sources: BCG FinTech Control Tower; Literature research; BCG analysis.

¹Fees are taken as the portfolio management fees, excluding fund fees, at \$100k of AuM. Ranges indicate choice in management type and other value-add services.

2.1.2 European: Smart Transformation as Driving Force to Reshape the Market

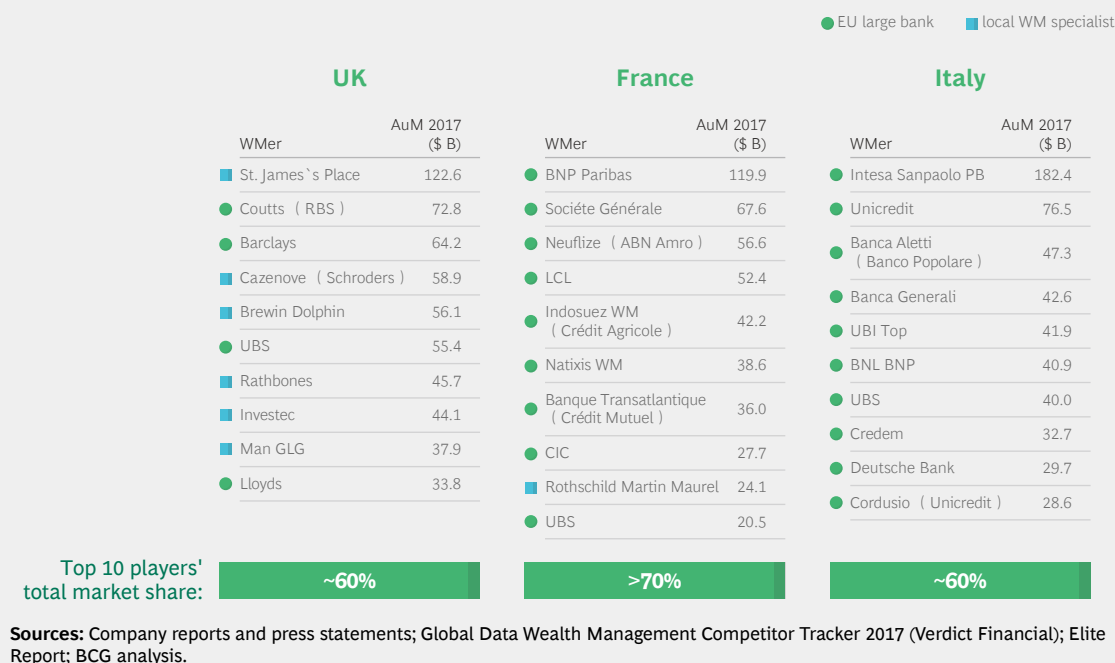
WM in Europe is dominated by established local WMers. Market structure is relatively stable, yet customers' degree of digitization and exposure to new technology are relatively limited. The top 10 WMers in both the UK and Italy account for nearly 60% of the total market, while the top 10 in France account for more than 70%²⁷. (See Exhibit 10.) Such highly concentrated markets leave small- and medium-sized players little room to grow, and to some degree hinder innovation. Compared with US and Asian markets, Europe (the birthplace of many top WMers) has lagged behind in terms of digitization and smart transformation. In 2018, for example, US-based digital wealth management (DWM) FinTechs raised nearly \$800 million, representing a 23% increase from the previous year, while in Europe total funding barely reached \$200 million, almost flat when compared to 2017.²⁸

Nevertheless, the status quo will likely be shaken by the promulgation of the revised *Payment Services Directive (PSD2)* in September 2019. PSD2 demands, for example, that

²⁷ Source: BCG's internal study on European WM.

²⁸ Source: BCG FinTech Control Tower 2019.

EXHIBIT 10 | EU Dominated by Established Traditional WMers: Top 10 Players in UK, France and Italy Account for Over Half of Market Share



banks give third-party providers access to user accounts. On the one hand, the directive vigorously promotes the emergence of integrated service providers, yet on the other hand, it also stimulates traditional WMers to experiment with smart technologies and to pursue new strategies such as the open bank model. The emergence of aggregators and open banks means the domination of the traditional WMers will likely come to an end, and the smaller WMers will emerge from the shadows. As a result, the market will become more competitive, and technological innovation will be more important.

- **Aggregator:** by consolidating users' account information derived from various financial institutions and combining a variety of WM services and applications, aggregators can better understand customer needs and provide customized products accordingly. Many small- and medium-sized WMers can also rapidly expand their services and the number of customers through cooperation with aggregators. For example, Yolt, an online payment platform in the UK, became the first platform to complete data docking with the nine leading UK banks that comprise the CMA9²⁹, bringing about a unified view of customer asset information across these institutions. In November 2018, Yolt's platform had 3.5 million API calls per week³⁰. It is also working with a number

²⁹ Note: 9 major UK retail banks that are first listed in open bank plan by Competition and Markets Authority (CMA).

³⁰ Source: Yolt's public information.

of small- and medium-sized institutions, such as robo-advisory company Wealthify, pension scheme platform PensionBee, and life insurance platform Anorak to build a one-stop financial services aggregator.

- **Open Bank:** in order to adapt and maintain competitive advantage, traditional large WMers have begun to make digital transformation a major part of their strategy. In early 2018, Lloyds Bank proposed to invest £3 billion in its comprehensive smart transformation, with the “Open Bank” business model at the heart of this process. This means it intends to build an open banking platform, assembling a variety of financial services and applications both in-house and from external partners to better reach customers. In June 2019, Lloyds officially launched the “Open Bank app”, combining savings and credit accounts, and planned on building a one-stop financial services platform through cooperation with Blue Motor, a financial leasing company, and Iwoca, a small and medium enterprises (SME) lending platform. In another example of joint operation, BBVA announced its partnership with Uber in Mexico in July 2019, intending to offer open bank financial services to drivers. Uber drivers are offered financial planning and other services including fee collection, salary payment, savings investment, loan application, and even daily expense discounts.

2.1.3 Asia: Smart Transformation as a Foundation for “Leapfrog” Market Growth

In China and other Asian markets, WM customers, despite their digital savviness, remain unsophisticated investors with a relatively short history of wealth accumulation, while WMers themselves suffer from limited advisory expertise as well. Traditional WMers, banks in particular, have captured the lion’s share of the market, relying largely on their strong offline channels and product-push sales approach, but they have yet to build professional advisory capabilities. FinTech giants focus their innovation efforts primarily on mobile payment for daily cash management purposes rather than for goal-based wealth planning and investment. Data show that a substantial share of Asia’s wealth is invested in cash management and other low-risk products, giving rise to super money market funds like Yu’e Bao, which has over ¥1 trillion in AuM. However, given its predominantly retail investor base with less than ¥2,000³¹ in AuM per user and its short investment horizons, Yu’e Bao is still a far cry from a professional WMer.

In such an immature market, digitization and smart technologies will be the underpinning of transformation. According to the World Bank, over 20 countries already have more mobile payment accounts than traditional bank accounts, mostly in Asia and Africa. Just as digitization has pushed many developing markets from a cash-only world to one

³¹ Source: 2018 Annual Report of Tianhong Yu’e Bao Money Market Fund issued by Tianhong Asset Management.

in which mobile payments are dominant, WM in developing markets like China can move from an era of limited professional human advisors to a new era of prevailing smart advisors. Smart technologies such as AI and AR/VR can both educate immature investors and help WMers to provide advisory services to the Mass Affluent. These emerging markets are therefore expected to grow by leaps and bounds driven by increasingly sophisticated investors, inclusive advisory services, and robust risk management.

In emerging Asian markets, traditional financial WMers and Internet giants should join forces drive the smart transformation. WMers can provide financial experience and expertise, while Internet players can offer customer traffic and smart technology infrastructure. These partnerships will benefit both sides. For example, Ant Financial formed a joint venture with Vanguard, an established American WMer, in June 2019. They aim to unlock the sales potential of Ant Financial's 700 million active users by leveraging the highly-rated WM capabilities of Vanguard. In addition, CICC and Tencent jointly established a technology services company in September 2018. This company will combine Tencent's technological expertise and large customer base with CICC's WM and retail brokerage capacity to create convenient and personalized WM solutions.

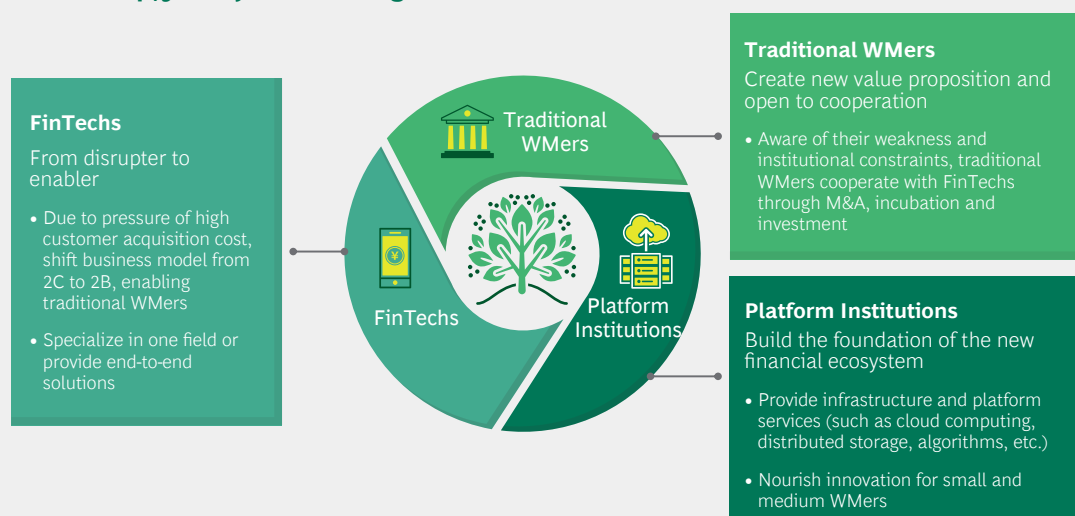
2.2 Players: A New Co-prosperity Dynamism Engendered by Partnership and Collaboration

Traditional WMers' reaction to FinTechs and Internet players has shifted from "disdainful dismissal" to "great threat" and to what is now "win-win collaboration." On the one hand, financial institutions have come to realize that strong technology and complement capabilities cannot be built in one day, and that their own institutional constraints hamper innovation and transformation. On the other hand, FinTechs and Internet players have realized their lack of financial expertise and understanding of WM and other financial services. Weighing their respective strengths and weaknesses, traditional financial institutions, FinTechs, and Internet players have positioned themselves well and build innovation-focused partnerships in which they compete with each other. These partnerships have extended beyond algorithms and technology, to data, use cases and other areas. (See Exhibit 11.)

2.2.1 Traditional WMers: Smart Transformation Gives Birth to New Value Offerings

In the past, WMers' use of digital technologies was mainly limited to automation in the middle and back ends to achieve cost reduction and greater efficiency. Now, smart technologies are considered to have potential in a much wider range of applications, such as

EXHIBIT 11 | Traditional WMers, FinTechs and Platform Institutions to Build An Ecosystem of Partnership, Jointly Stimulating Innovation



Sources: Literature research; BCG analysis.

mobile channel innovation, more precise KYC, and robo-advisory. Taking Vanguard Group as an example, they found through research that a considerable number of middle-aged and elderly customers are highly receptive towards digital means and exhibit significant demand for professional investment advisory services, but they are price-sensitive and emotionally volatile. Tailored to the above characteristics of middle-aged and elderly customer requirements, Vanguard launched the “Personal Advisor Services” (PAS), a hybrid robo-advisory service, with four core value propositions: Goals, focusing on investment goals such as pension planning and child education; Balance, emphasizing decentralized asset allocation to meet low-risk, low-volatility investment needs; Cost, ensuring investment advice from professional advisors at low rates; Discipline, positioning human advisors as “investment coaches” to guide the customers’ investment behaviors and to avoid emotional decisions. At present, PAS is ranked first in global robo-advisory services with \$140 billion AuM.

Meanwhile, major traditional institutions have become aware that they cannot execute technological transformations as quickly as they would have liked, and have instead formed alliances with tech firms. There are three main models of cooperation.

- **M&A:** BlackRock, Goldman Sachs, and Interactive Broker have, respectively, acquired the robo-advisory companies FutureAdvisor, Honest Dollar and Covestor. The effects were immediate and the benefits abundantly clear. For instance, BlackRock acquired FutureAdvisor in 2015, gaining access to its 4,500 Mass Affluent customers (with an average of \$130,000 AuM per account), giving the established asset manager a great

opportunity to enter the Mass Affluent market and to quickly build its own robo-advisory capabilities. By the end of 2018, FutureAdvisor's total AuM was close to \$1.2 billion³², more than double the amount when it was acquired.

- **Incubation and investment:** Goldman Sachs has invested a total of \$9 billion in 35 FinTech companies over the past five years, covering technologies such as blockchain, machine learning, and AR/VR³³. It also invested in smart WM solution providers like Uala (which has a virtual banking app) and Neyber (the core of which is a personal financial management platform).
- **Co-building:** UBS formed partnership with Broadridge to build an end-to-end smart wealth management platform in 2013, hoping to acquire cutting-edge applications and technology at the optimal cost. The platform has enhanced UBS's end-to-end smart capability by: (a) helping financial advisors and improving customer experience through providing front end with tools like account management support and cross-market order management; and (b) improving back end business with global settlement, portfolio adjustment, and HR administration. Now, the platform has opened its applications to other financial institutions, with over 200 small- and medium-sized financial institutions enjoying smart services on it.

2.2.2 FinTechs: From Disrupters to Enablers

FinTechs face higher customer acquisition costs than ever before; new WM FinTechs need an estimated \$2 billion in AuM to break even. They also need a rich supply of data in order to regularly update their algorithms. However, lack of clients will lead to insufficient data and practical application scenarios, which hinders small- and medium-sized financial institutions from creating great value. **Consequently, many FinTechs have moved from being market disrupters to being partners to traditional WMers.**

The shift from the 2C to 2B space is the primary way for WM FinTechs to accumulate AuM and customer data quickly and cheaply. For instance, Betterment, a now leading US robo-advisory FinTech company which started by targeting individual clients, failed to grow its AuM above \$2 billion in the first seven years since its inception and so in 2014 it introduced "Betterment for Advisors". The campaign gave more than 300 SME WMers access to strategic robo-advisory tools. As a direct result, Betterment's AuM grew to \$14 billion in four years.³⁴

³² Source: US Robo-report company Backend Benchmarking- 2018 Q4 Report.

³³ Source: Pitchbook database, covering 2014-2018 Goldman Sachs investment activities.

³⁴ Source: ADV document that Betterment submitted to Securities and Exchange Commission (SEC).

EXHIBIT 12 | FinTechs Could Offer Small and Medium WMers with complete, Smart Solution Covering the Entire Value Chain

	Privé Technologies	Broadridge	Marstone	WDX	ABAKA
Client lifecycle mgmt.	✓	✓	✓	✓	
Virtual support	✓	✓		✓	✓
Advisor interaction	✓	✓		✓	
News, research, alerts	✓	✓			
Analytics & simulation	✓	✓	✓		✓
Aggregation	✓	✓	✓		✓
Execution	✓	✓	✓		
Back-end automation	✓	✓	✓		
Portfolio & risk mgmt.	✓	✓	✓		
	Front-to-back services via modular API access	Front-to-back services via modular API access	Front-to-back solution leveraging strategic partnerships	Customer engagement software integrating on top of PMS	Customer digital engagement chatbot and portal

Source: BCG FinTech Control Tower.

Note: Smart solutions will evolve as the business structure of each company changes, and this diagram does not represent the current final state.

Many FinTechs are now aiming to provide WMers with smart solutions covering the entire value chain. (See Exhibit 12.)

- Some FinTechs start from one particular pain point within their value chain, such as smart interaction, investment research, or risk control, to build up expertise.** For example, Kensho, a US smart investment research pioneer, specializes in data analytics and industry research. Enjoying the moniker “Siri of Wall Street”, it provides services to a number of large investment banks including Goldman Sachs, J.P. Morgan, and BAML. It has developed the market analysis software Warren, who operates as a natural language search engine for the financial market and incorporates the application of multiple smart technologies including big data, NLP, and machine learning. Users can ask questions such as “Which stocks might be affected by the hurricane in Florida today?” and they receive answers based on Warren’s rapid mass data analytics within a matter of seconds.
- Other FinTechs provide end-to-end smart total solutions covering the front, middle and back ends of WMers.** Privé Technologies, a FinTech company founded in 2011, offers WMers module-based smart apps covering investment research, operation automation, robo-advisory services, and marketing. Privé now services over 60 institutions, including Credit Suisse, Citi, and other leading WMers.

2.2.3 Platform Institutions: Building the Foundation of the New Financial Ecosystem, Fostering SME Innovation

Many large tech companies are no longer satisfied with their current roles as tech, product, or even service providers but want to become open platforms which providing infrastructure and PaaS (Platform as a Service). On the one hand, platforms provide technical expertise (such as cloud computing, distributed storage, algorithms, and even data and application scenarios) to all types of players in the ecosystem; on the other hand, they optimize various technologies and algorithms through continuous testing and practical application from various players using their platforms. The emergence of these platform-based companies has greatly lowered the threshold for small- and medium-sized players to employ new technologies and test for innovation.

- In the US, Amazon Web Service (AWS) helps various types of small- and medium-sized institutions bypass the high cost of building infrastructure and the difficulty of acquiring sufficient data. AWS provide WMers with data management, AI application, and compliance solutions.
- In China, Alibaba Cloud, Tencent Cloud, and Huawei Cloud have all developed cloud solutions for the financial industry. Alibaba Cloud provides a cloud data center, where it leverages cloud computing and big data for nearly 2,000 financial clients, covering WMers, equity, and insurance. Meanwhile, using vast reserves of client data, Alibaba Cloud and Ant Financial have developed AI algorithms for customer authentication and anti-fraud functions. At the start of 2018, Alibaba Cloud and a Chinese securities company reached a comprehensive digital and smart cooperation agreement, with aims to use distributed architecture, mass data, and mature technologies from Alibaba to allow the securities company to build up its client service system.

2.3 Regulations: Changing and Maturing Regulatory Environment Fosters RegTech Development

2.3.1 Changing Regulatory Environment Brings More Challenges for WMers

WMers are faced with mounting and increasingly complex compliance requirements.

- **China: *The Guiding Opinions on Regulating the Asset Management Business of Financial Institutions (Guiding Opinions)* imposes stricter requirements on WMers.** In the *Guiding Opinions* introduced in April 2018, the Chinese government issued instructions on Abolish Rigid Payment, Prohibit Passageway Business and

Prohibit Term Matching, applying more detailed and comprehensive requirements for institutional compliance. Moreover, the *Financial Holding Company Supervision and Regulation Draft Rules* issued by People's Bank of China (PBOC) in July 2019 sought to tighten regulations regarding financial holding companies by stipulating rules regarding market access, shareholder qualifications, capital sources, corporate governance, related-party transactions, and firewall systems. Ant Financial and other traffic-based institutions thus have an urgent need to build new capabilities to cope with tightened and more complex regulations.

- **US: *Regulation Best Interest*, unveiled after several rounds of discussion and expected to take effect in June 2020, urges WMers to make clients' best interests the top priority, forcing a number of institutions to redesign internal procedures and protocols.** It states that the WMers must disclose all relevant investment information and eliminate conflicts of interest. This means WMers should carefully examine the differences between current processes and the requirements stated by the regulation, redesigning internal procedures and control mechanisms as necessary and providing new training for key personnel.
- **Europe: *The General Data Protection Regulation (GDPR)*, which took effect across EU in May 2018, explicitly requires enterprises to take data protection measures and introduce comprehensive record keeping systems for data storage and handling.** The revised *Markets in Financial Instruments Directive (MIFID II)*, introduced in the same year as the *GDPR*, further strengthens protection for clients by improving standards of product transparency, KYC and best execution.

The increasingly stringent regulatory requirements imply higher compliance costs for WMers, especially for multinational players who have to deal with not only more complex corporate structures but also more than one regulatory jurisdiction. For example, according to a Duff & Phelps's survey, US WMers spent 4% of overall revenue on regulatory compliance in 2017. That is predicted to increase to 10% by 2022³⁵. In the worst case scenario of a compliance failure, WMers might end up with devastating reputational damage in addition to fines that can, on occasion, exceed \$1 billion.

2.3.2 RegTech Grows Rapidly, Demonstrating Its Value in Cost Reduction, Efficiency and Smart Compliance

The changes in the regulation and compliance landscape in recent years have given rise to a wholly new business called regulatory technology (RegTech), which has


³⁵ Source: a report by Duff & Phelps – 2017 *Global Regulatory Outlook View Point*.


helped financial regulations become more efficient, accurate, professional, and open. According to FinTech Global, an independent UK data institution, funds raised by global RegTech firms increased two and a half times to \$4.5 billion between 2017 and 2018, representing a CAGR of almost 50% between 2014 and 2018. In addition to simple cost-cutting and efficiency improvements, digital and smart technologies can also help institutions meet regulatory requirements in a more agile manner. On the one hand, through real-time scanning, pattern recognition, and other technologies, institutions can achieve more agile adaptation to regulatory compliance changes. On the other hand, smart technologies can help institutions better meet regulatory requirements by eliminating human errors and identifying deeper potential risks.

Currently, RegTech is chiefly applied in regulatory tracking, internal monitoring, risk analysis, and regulatory reporting. (See Exhibit 13.) Of the four applicable fields, most leading companies are focusing on internal monitoring and risk analysis, particularly on KYC and anti-money laundering (AML). For example, Fenengo, a global leading RegTech company, is providing KYC and AML solutions for larger traditional financial institutions such as UBS, Santander, and Bank of China. Fenengo's services can be broken down into three main categories: (a) establishing digital customer files that can be constantly updated, easily accessed, and centrally managed; (b) developing an online system with a summary of current regulatory requirements to facilitate WMers' screening procedures, to spot gaps between current status and regulatory requirements, and use necessary client information for risk assessment to meet requirements; (c) conducting regular risk ratings among WMers based on data analysis, and indicating whether further risk control measures are needed by comparing the rating to past ones.

EXHIBIT 13 | Rapid Development of RegTech Globally Has Helped Institutions Meet Compliance Requirements Better

Core values of RegTech

 **More agility**
Real-time response to regulatory changes

 **Better compliance**
Elimination of human errors and identifying underlying risks

Mainly applies in four areas

Regulatory tracking	Risk monitoring and analysis	Internal auditing	Regulatory reporting
Keep track of regulatory updates and automatically evaluate the impact of regulatory changes to help WMers respond promptly	Risk monitoring and analysis driven by big data to provide deeper insight into areas such as KYC and AML	Real-time AI auditing to automatically identify violations and make recommendations for improvements, to minimize impact from human error and moral hazard	Automatic report generation enabled by technologies such as image recognition and API to improve filing efficiency

Sources: Literature research; BCG analysis.

3. China Focus: The Pivotal Role Smart Solutions Will Play in Helping Balance Growth with Compliance in the Wealth Management Sector

3.1 China's Wealth Management/Asset Management Regulatory Changes Bring Both Challenges and Opportunities

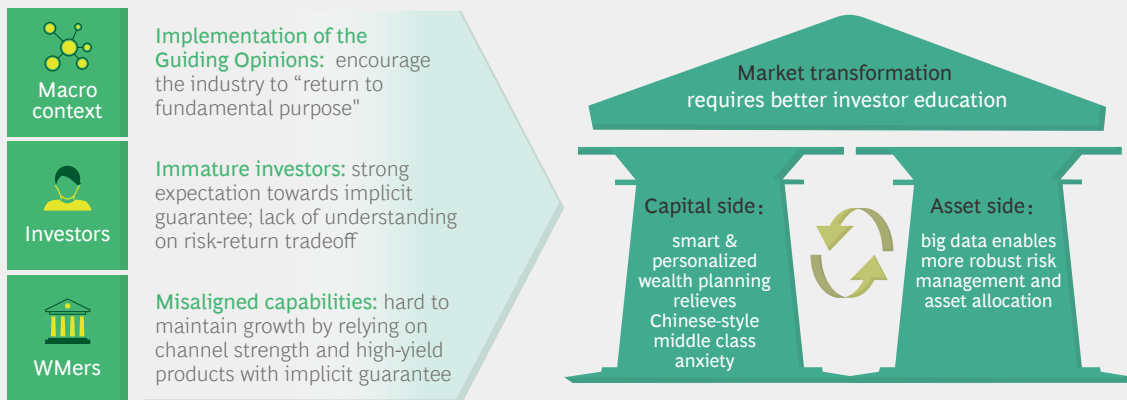
The publication of the *Guiding Opinions* by the PBOC in 2018 marked a significant milestone in the development of the Chinese WM industry. The stated goals of “a return to the fundamental purpose” and standardization of Chinese WM set new and higher requirements for Chinese WMers. The new rules underline the abolition of implicit guarantees and a shift to NAV-based products, prohibit misleading sales practices, and stipulate that WMers promote investment products prudently. They also require WMers to accurately identify investor risk tolerance and select potential customers based on a strictly defined suitability standard. Finally, they advocate a real-time, transparent regulatory approach, requiring detailed disclosure of underlying assets, risk control methods, and compliance capabilities.

AI and other smart tools have unique applicability to the Chinese WM market as most Chinese WMers currently have insufficient capabilities to meet the new requirements specified by the *Guiding Opinions*. In the mobile Internet era, banks and other WMers not only face a decline in traditional offline channels, but the new *Guiding Opinions* also make it difficult to continue offering high-yield products underpinned by “shadow banking”. Other challenges for WMers include the need to accurately assess customer risk tolerance and foster reasonable expectations of investment return in face of the decline of implicit guarantees, as well as proving their professional judgement and portfolio allocation skills to help clients navigate a volatile macro-economic market. Indeed, establishing systematic and professional skills and capabilities based on human advisors is crucial, but they cannot be developed overnight. New technologies like big data analytics, AI, and smart interactions can, however, enable Chinese WMers to overtake their counterparts in developed countries. (See Exhibit 14.)

Specifically, we believe that AI and other smart technologies will resolve the current pain points in Chinese WM market in three aspects: allowing WMers to help improving investor education, customizing robo-advisory services for the Mass Affluent segment, and thus enhancing risk control. They will also, in time, propel the market's healthy development and help the WM market “return to the fundamental purpose” as promoted by the *Guiding Opinions*.

EXHIBIT 14 | Smart Transformation Has Unique Applicability to the Chinese WM Market

China's WM market is approaching a turning point... ... where smart transformation has unique value



Sources: Expert interview; Literature research; BCG analysis.

3.2 Better Investor Education Is Crucial for Market Transformation

Investor education is uniquely important to China's wealth management market. Chinese investors lack a proper understanding of the risk-return tradeoff due to the reliance on implicit guarantees. Investment knowledge is also limited to most investors. Consequently, a more advanced understanding of WM needs to be in place before the Chinese WM market can provide high-quality fiduciary WM services. If investors cannot let go of the implicit guarantee mindset, WMers will come under undue pressure from "irrational" investors. And investors themselves might suffer unbearable losses as their real risk appetite is disguised.

Deterred by abstract financial and investment concepts, most non-professional investors lack basic financial knowledge and understanding of investment products. Investor education thus faces three challenges: investors lack interest and attention, incomprehension of jargon, and difficulties in understanding risks and returns. Investor education can be effective only when all the three challenges are resolved. To do that, relying solely on messaging from the salesforce is far from adequate. WMers must also build a content ecosystem that leverages mobile interface and digital technologies to master content operations.

We believe successful WM content operations must incorporate the following key elements: first, the ability to spark interest or meet certain needs of customers; second, the skill to leverage more vivid and interesting messaging to simplify complex financial concepts; and third, the breadth and depth to generate or curate truly personalized content

tailored to each individual. Only after building such a smart content ecosystem can WMers make investment simpler, easier, and more tempting for the Mass Affluent segment.

- **Personalized content:** many large WMers leverage AI technologies to build personalized content communities. Lufax, for example, has established a content community, and recommends customized information and advice based on investment experience, transaction habits, and the risk preferences of users. It also dynamically adjusts content according to the browsing history of each user. In another example, through algorithm-powered recommendations, Xueqiu, which has no fewer than 12 million active users and produces 200,000 discussion threads per day³⁶ covering topics such as equities, funds, real estate, and insurance, distributes a great deal of content to its large user base efficiently.
- **Interesting content:** immersive and interactive investment education can facilitate better understanding of concepts that sound boring to non-professional investors and may even inspire potential investors to do independent research. For example, a fund company used “Fortune Account” (a platform developed by Ant Finance) to create online investment characters based on four female characters in the popular TV drama “Ode to Joy”. The firm produces educational articles and videos featuring these characters in a medium which the target audience finds easy to digest. It subtly instills investment concepts into the minds of investors and successfully educates investors. Elsewhere, the quiz game “Finance Business Battle”, launched by Tencent Licitong, familiarizes users with investment-related topics through online quizzes and offers discounts according to the results. These games often gain popularity through word-of-mouth, and in the end, encourage more customers to purchase fund shares.

3.3 Capital End: Personalized Wealth Planning Relieves Chinese Middle Class Anxiety

China has a large and rapidly growing middle class³⁷, which brings significant opportunities for the digital WM market. In the past decade, the pursuit of middle class and Mass Affluent customers with traditional, non-digital methods has been very costly. However, nowadays WMers can utilize smart technologies to provide personalized wealth investment services for the middle class in an efficient and cost-effective way. In particular, the one-child generation in China, mostly born in the 1980s and 1990s, is dubbed “the anxious

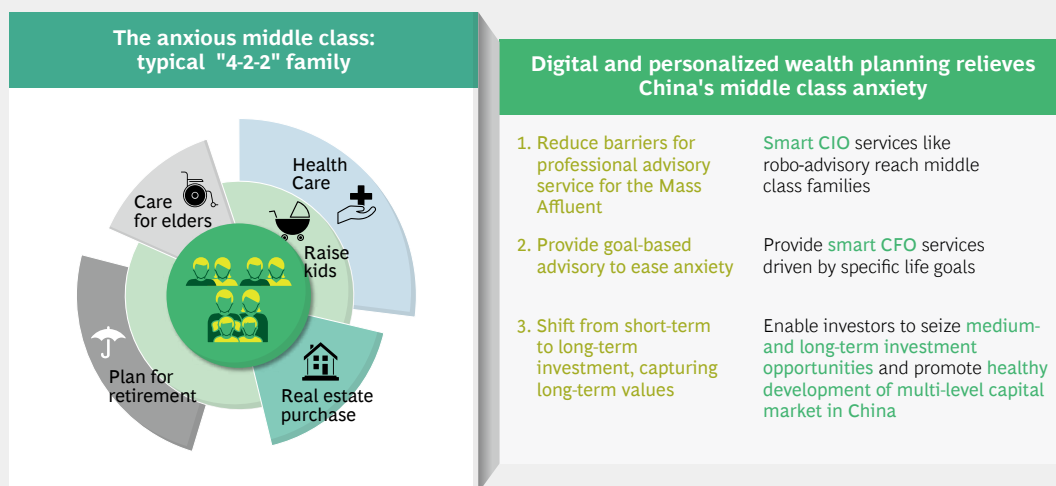
³⁶ Source: official announcement by Xueqiu.com upon completion of D-round financing in July 2018.

³⁷ “In March 2018, HE Lifeng, the head of NDRC, said at a press conference held during the 1st session of the 13th National People’s Congress that “China now has the largest middle-income population (i.e., over 400 million) in the world...”

generation”, because of their particular needs and considerable financial pressures. In a typical 4-2-2 family structure³⁸, for example, a married couple faces not only the pressures of a mortgage, supporting elderly parents and raising children, but also the need to plan for retirement and health care. Therefore, wealth management and long-term financial planning have become increasingly important. **Against this backdrop, personalized WM planning through channels like robo-advisory services has become an effective tool to help alleviate middle class anxiety.**

- Goal-based advisory eases anxiety:** China’s middle class is exploring optimal budget planning and investment approaches to meet certain family goals such as buying a house or paying for children’s education. In this context, family wealth management and financial planning services supported by smart technologies and big data have come to the rescue of “middle class anxiety”. (See Exhibit 15.) For example, China Merchants Bank launched the Sunflower Financial Planning Service System in 2018 that offers wealth management solutions for client’s entire family. The system is powered by a smart model that automatically calculates, upon receiving input variables, the capital needs of each family and recommends an investment portfolio accordingly. If the goal is to provide for a child’s overseas education, for example, the model considers the living standards and levels of inflation of different countries, the nature of education sought, and family assets and liabilities.

EXHIBIT 15 | “The Anxious Middle Class” in China Generates Great Opportunities for Digital WMers and Smart Application such as Robo-Advisory



Sources: Literature research; BCG analysis.

³⁸ 4-2-2 family structure: a couple from one-child generation with four elderly parents and two children.

- **Prolong the investment period to help customers better capture investment value:** after China's decades of rapid economic growth, many Chinese investors lack patience and set expected return at 5%-8% or higher for a short investment duration (usually within one year). This investment model is rendered unsustainable by changes in the macro environment. Robo-advisory WM can foster the healthy development of the Mass Affluent segment by guiding investment targets to more long-term goals. Such efforts will facilitate a healthy capital market and enable the Mass Affluent segment investors to seize medium- or long-term investment opportunities in face of short-term market fluctuations.

3.4 Asset End: Big Data Enable More Robust Risk Management and Smarter Asset Allocation

Chinese WMers are facing unprecedented complexity in the ever more important field of risk management. Firstly, more stringent regulations require WMers to establish more professional and comprehensive risk management capabilities. Secondly, as a result of implicit guarantee, risk control and prevention for loss of principal are more important for most Chinese investors than the upside of achieving extra returns. Thirdly, as the growth of the Chinese market slows, the probability of asset default has increased. Finally, as the breadth and complexity of WM continue to increase, WMers face more internal control challenges such as the possibility of human errors and misconduct.

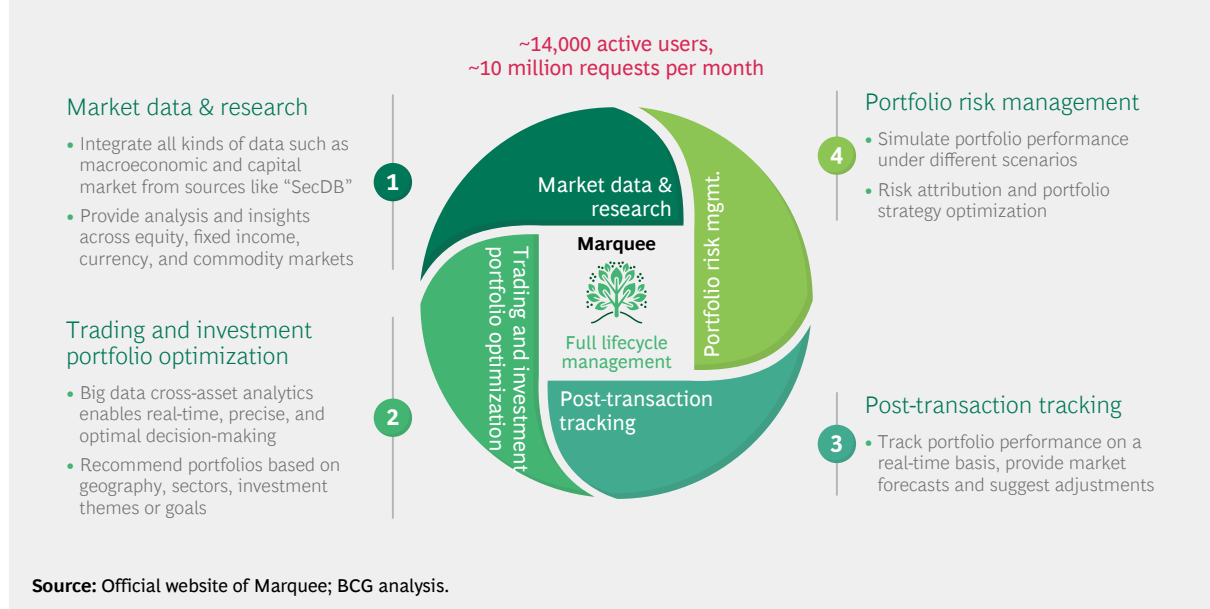
Smart technologies like big data analytics and automated compliance programs enable WMers to improve the capabilities of full-cycle portfolio risk monitoring and contingency planning, ensuring better compliance in a volatile market environment.

- **Risk monitoring and asset allocation adjustment are implemented throughout the investment cycle:** data-driven risk monitoring accomplishes goals such as wider data coverage, efficient analytics, and stable decision-making. New technologies enable WMers to analyze more structured and unstructured data related to investment risks than was possible in the past. Secondly, vastly superior to the decision-making speed of human traders, data and rule-based systems can perform hundreds of analyses per second and achieve close to real-time decision-making. Finally, the system follows pre-defined rules to implement decisions that ensure stable performance and better compliance. In 1993 in the United States, Goldman Sachs launched a data-driven risk management project named "SecDB"³⁹, which was initially designed to support currency and commodity transactions. Around twenty years later, the big data-based

³⁹ SecDB: Securities Database.

system not only calculates 23 billion prices for over 2.8 million positions and 500,000 market scenarios per day⁴⁰, but also constitutes a risk management platform across all of Goldman Sachs asset classes. In 2013, the company developed a trading platform named Marquee, which was based on “SecDB” to provide institutional investors with full lifecycle investment management services, covering the pre-investment (market data and research), investment (investment optimization and portfolio), and post-investment (tracking and portfolio risk management) phases. Marquee now has 14,000 active users and receives up to 10 million requests per month⁴¹. (See Exhibit 16.) In China, OneConnect, a subsidiary of Ping An Group, provides WMers with a full-life-cycle portfolio risk management solution that covers all aspects of the value chain, including market information acquisition, investment portfolio, trading orders, valuation, and risk management.

EXHIBIT 16 | Goldman Sachs’ Marquee Platform Provides E2E Investment Management Services Based on Smart Technologies to Institutional Investors



- **Automated compliance and internal control programs act in the best interest of clients:** algorithm-based investment advice is unaffected by human emotions or personal interests in that digital processes ensure everything is done according to algorithmic rules. Automated internal control programs have enabled WMers to add a more objective line of defense. For example, Credit Suisse relies on an internal CCRO

⁴⁰ Source: Goldman Sachs Presentation to Deutsche Bank Global Financial Services Investor Conference in 2015.

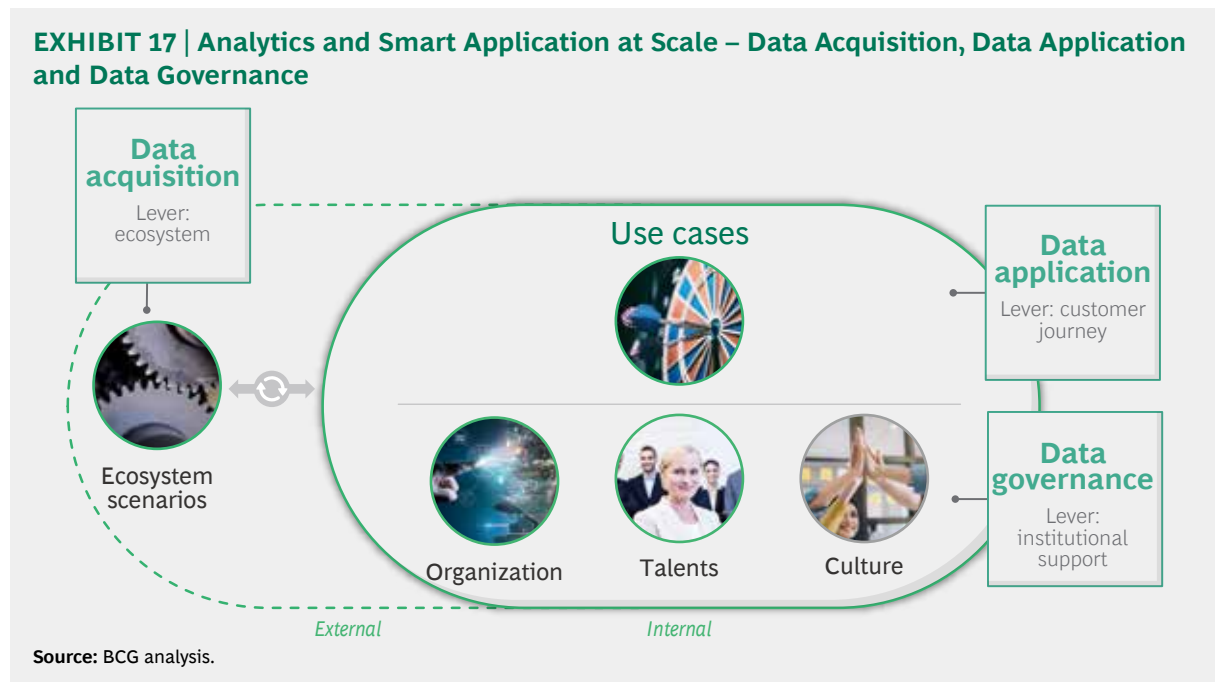
⁴¹ Source: data provided by Goldman Sachs CFO Stephen Scherr at a briefing on Q1 performance in 2019.

system⁴² to ensure that global compliance requirements are strictly followed. At the core of this system is an AI-driven compliance program named James Robot, which is powered by analysis of billions of records. The program can complete compliance checks at a speed 200 times faster than human reviewers and helps Credit Suisse significantly reduce transactional compliance risks.

⁴² CCRO = Chief Compliance and Regulatory Affairs Officer; Credit Suisse has established an independent department to develop and operate its technology-driven risk control and compliance platform.

4. Wealth Managers Must Acquire New Capabilities to Win in the Smart Era

How can WMers seize new opportunities in the smart transformation era and maximize business value? As shown in Exhibit 17, we believe that they need to build capabilities around three pillars.

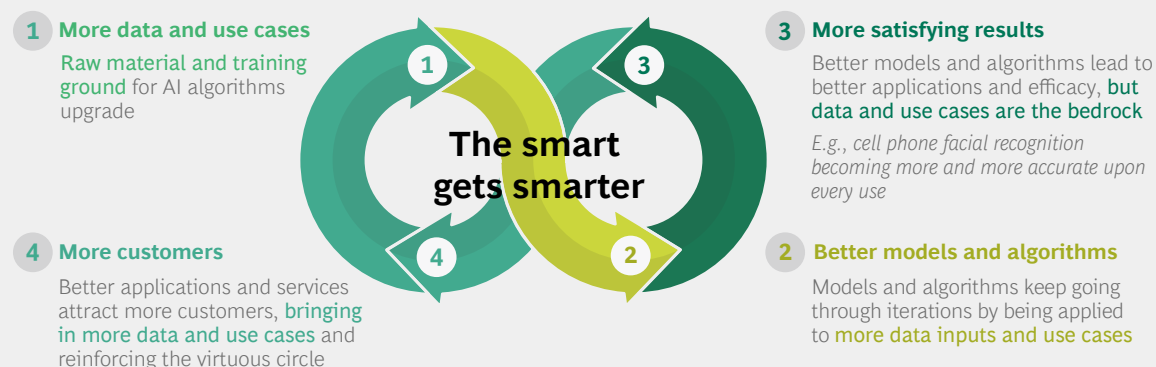


- First, they need **constant data acquisition**. This means building an ecosystem of partners to ensure the acquisition of sizeable, diversified, and relevant data.
- Second, they need **fit-for-purpose data application**. Without appropriate customer value propositions, data acquisition on its own is meaningless. This requires institutions to be customer-centric, to conduct end-to-end, all-round journey remolding, and to identify valuable data application scenarios.
- Lastly, they also need an **effective system of data governance and application** which comes from fitting organization, workforce and corporate culture, so as to make the smart application achieve versatility and scalability.

4.1 Ecosystem of Partners: Data and Use Cases Are Far More Important than Algorithms

Algorithms are important, but they can only be made useful by the input of size-

EXHIBIT 18 | Data and Use Cases are More Important than Algorithms, as They Are Key to Developing AI Capabilities and Keeping Smart Smarter



Sources: Literature research; BCG analysis.

able, multi-dimensional, and highly relevant data, as depicted in Exhibit 18.

Where can this wealth of data be acquired? **We believe WMers should build an ecosystem of partners where data sharing among participants can maximize the benefits.**

The quantity of data is not enough in itself; the data must have relevance to be of quality. For example, **for the WM business**, customer investment preference and risk appetite are more useful for generating differentiated insights than standardized information such as customer assets, income level, and demographics. **And the analysis of customers' browsing histories of finance and economics content will be the best reference to capture relevant data.** For instance, Ant Fortune has invited finance media and professional asset managers to post WM and financial content on its platform. In addition, it supports video streaming, games, and other marketing campaigns and also provides data analytics tools. Through these effort, Ant Fortune can not only attract traffic but also, more importantly, deepen its understanding of investors' risk tolerance and investment preference. It could then use those insights to further generate more suitable products and more effective investor education.

Institutions might need to consider a more open technology framework to ensure both security and efficiency of data interaction between cooperating institutions. For example, the use of blockchain technology can help reliably store and efficiently share the relevant with multiple parties.

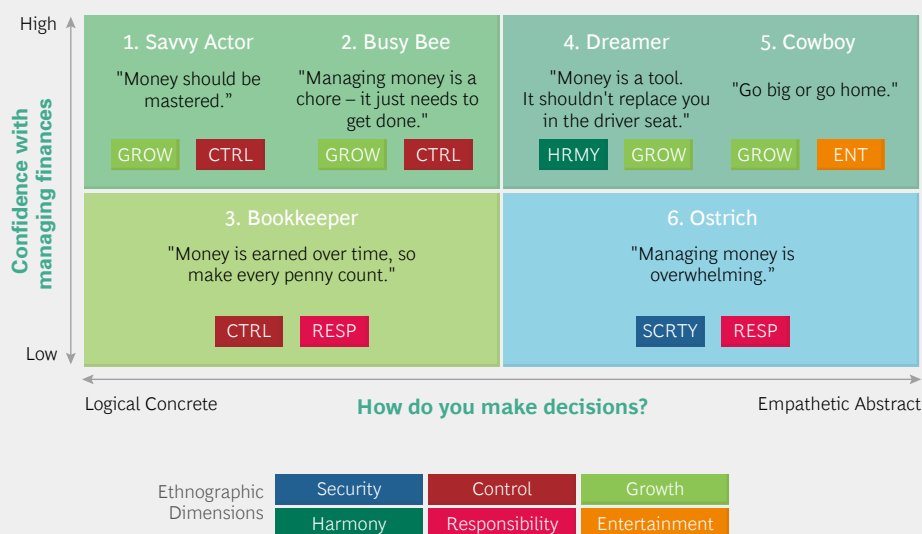
4.2 Reimagining the Journey: Customer-centric Is the Essence of Smart

How should firms organically incorporate smart applications, improving the customer experience while also reducing costs? **The best method, we believe, is to start from reinventing customer value propositions and reshaping the entire customer experience.** In this way, internal operations will be incentivized to transit from an experience-driven to a data-driven approach.

First, successful improvement of journey redesign derives from more accurate customer segmentation, more customer insights, and a more matched value proposition. What are the key dimensions that really influence customer choice? The use of statistics and big data analytics shows that traditional segmentation based on metrics like wealth level and age group yields far from ideal results, whereas a more effective method might include analysis of more personal and behavioral data.

For example, a leading global bank recently examined its customers and plotted their relevant data on two axes (See Exhibit 19) when designing its new robo-advisory offerings for the Mass Affluent segment. One axis is termed “investors’ decision-making approach”, in relation to which investors can be further divided into two segments termed “logical concrete” and “empathetic abstract”. The other axis is termed “investors’ attitude toward wealth management”, and in relation to this, clients can be also categorized as those “with confidence to conduct wealth management independently” and those “without confidence

EXHIBIT 19 | A Leading Bank Set Customer Segmentation Innovatively Based on Ethnographic Research with Six Personas for Smart Customer Engagement



Sources: Expert interview; BCG analysis.

to conduct wealth management independently”. Thus, the bank has four different quadrants of customer segments. The “empathetic abstract” without confidence segment, called the “ostrich” group, is identified as an area of opportunity because it tends to be neglected by competitors. The bank therefore set about targeting the ostriches by offering robo-advisory services, and designing new marketing as well as client-interaction strategies. Sales duly climbed shortly afterwards.

We noticed that **the most successful institutions are those that pay attention to customer feedbacks and build products hand-in-hand with customers**. For instance, a leading Asian private bank conducted 100 one-on-one customer interviews and iterated 108 different versions before they launched their customer app so as to fully incorporate customer feedback. “Only when we were really ‘co-creating with customers’ did we find that many features that we believed important are not at all in customers’ eyes,” said a spokesman for the bank.

Secondly, reshaping the customer journey successfully is an arduous project that requires holistic effort. “Our biggest challenge is to align middle and back end operation systems with front end transformations,” said the chief operating officer (COO) of Credit Suisse Private Banking (PB). Credit Suisse designed an entirely new digital experience for its PB customers, using its mobile app as the principal vehicle. The bank has implemented 300 new functions entirely reshaping dozens of customer journeys, **each underpinned by the complete re-engineering of processes and systems across the front, middle, and back ends**. Front-end functions require lasting and comprehensive efforts to refine operational detail. For instance, to answer the question “How to make a remote video call?” the app requires answers to a series of further questions: Where to make the call? What should the advisors wear? Do they need headphones? Do they need to be trained to speak to the camera? Do we need to establish a monitoring and auditing system for the video calls? How to transform the technology to ensure a smooth, uninterrupted call?

Institutions can integrate smart applications to **transform customer service from one that is reactive to one that is proactive, cultivating more seamless interactions with the customer**. Lufax’s intelligent wealth management interface, for example, deploys algorithmic sensors at key stages, such as account opening, product purchasing, and linking bank cards with accounts. If a visitor to an interface is there for an unknown reason or a transaction gets interrupted, a process wizard will be triggered to provide customized assistance. The system deployed sensors covering all customer interactions by May 2019, serving over 44 million users while also doubling sales conversion.

4.3 Analytics at Scale: Build a Data-driven Organization

While the reshaping of the customer journey requires **effective data application**, it also requires **an effective system of data governance** which befits the organization, workforce, and culture.

Organization: WM operating system will become more client-centric and data-driven. With a data-driven operation, decisions about customer interactions will be based on data and not conventional wisdom; and machines will assist or even replace humans in making rapid judgments and decisions.

To achieve this end, a centralized and strong middle end needs to be built, with business operation and data platforms at its core. The data platform builds data asset and provides the business platform with data analytics results for large-scale usage. The business operations platform will then provide recommendations on business strategies to the front end teams. For example, the overall marketing strategy of WM account managers, including marketing leads, content, timing, and tone, may be developed by the business operation platform based on data insights and then sent to the enterprise tablets of account managers. The business operation platform will be the command center of the data-driven organization, enabling greater agility and efficiency by the front-end account managers.

Building a strong middle end, especially a data-centric one, is a long-term project. Institutions are advised to spare no efforts in building proper data governance. They should set up data management roles in the leadership of business and IT departments to take charge of management mechanisms, data standards, data quality, and system management, etc.

Workforce: the workforce structure of a data-driven organization differs markedly from that of traditional organizations. Overall, the former has a higher proportion of technology talent than the latter. At Goldman Sachs and Ping An, for example, the technology team accounts for a third of the entire company headcount. In terms of talents, data-driven organizations have greater reliance on those with customer insights and data application capabilities, such as customer experience designers, behavioral psychologists, content operation specialists, data scientists, machine learning experts, and blockchain experts.

Culture: institutions should promote the importance of data, drive cross-departmental collaboration, and establish an agile culture.

- **Data culture:** institutions need to reach a top-down consensus, making sure that

the value and necessity of the data-driven approach is comprehensively recognized across the firm and make a continuous commitment to reinforcing those capabilities.

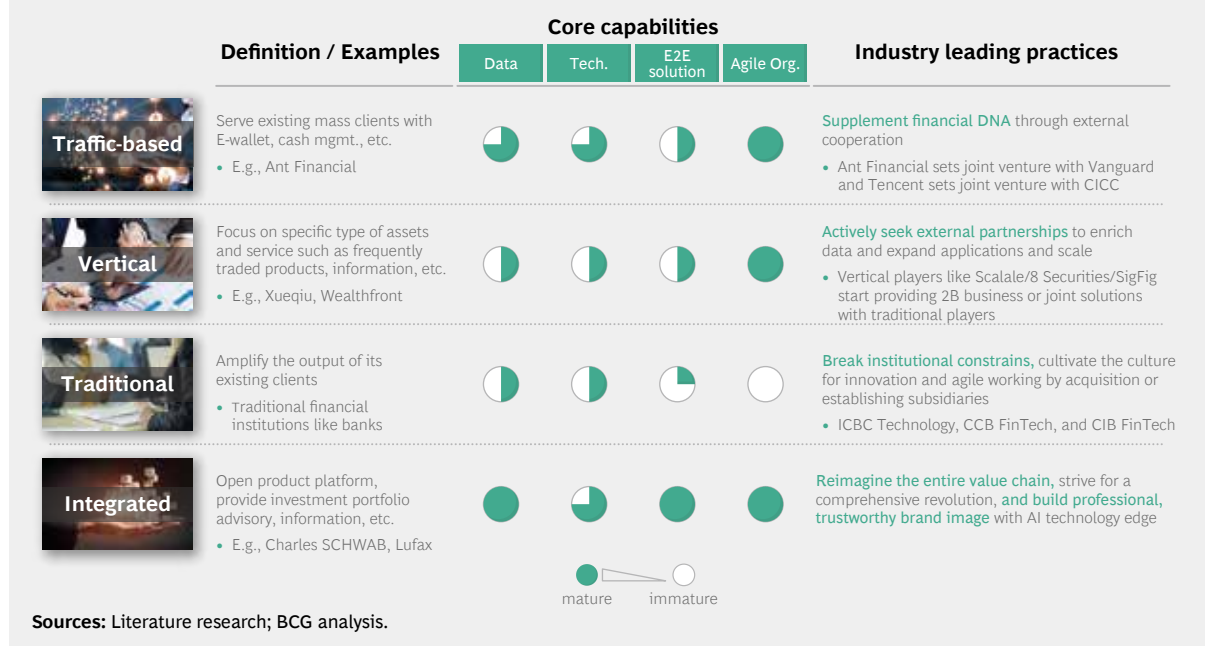
- **Collaborative culture:** banks and other traditional WMers divided into multiple departments should **break down departmental and IT silos**, facilitating an open and collaborative structure and culture.
- **Agile culture:** institutions should launch a range of initiatives to enhance underlying capabilities and develop data use cases. To facilitate the implementation of these initiatives, institutions should **set up cross-functional agile teams with clear and measurable goals, bringing together IT and business staff with adequate resources**. Experience shows that the most agile organizations not only enable more efficient delivery at a lower cost, but also boost staff morale, the absence of which is one of the main barriers to a successful internal transformation.

4.4 One Convergent Goal, Four Divergent Routes

In our *Global Digital Wealth Management Report 2018*, we identified four types of digital WM players: traffic-based players, vertical players, traditional players, and integrated players. All four types have their respective advantages. (See Exhibit 20.)

- **Traffic-based players:** the core strength of traffic-based players like Ant Financial lies in their ability to apply data and systematically use AI. Alibaba and Ant Financial are far ahead of competitors in terms of technical sophistication, data governance, organizational excellence, and talent. However, as a newcomer to the WM industry, leading traffic-based players often lack the requisite in-house skills to interpret regulatory policies, minimize financial risks, acquire necessary financial data, and customize comprehensive end-to-end solutions for HNW individuals with complex needs.
- **Vertical players:** vertical players like Xueqiu and Wealthfront usually have the unique advantages of data accumulation and algorithms in certain aspects of the WM business but lack a systematic approach to provide end-to-end solutions. Moreover, since vertical players tend to implement the application of smart technologies on small-scale, their impact is often unremarkable.
- **Traditional players:** traditional players like banks have accumulated significant advantages based on extensive industry experience, thorough understanding of regulatory requirements and risks, and end-to-end service systems. However, many of them face obstacles in organization, talent, and culture, such as internal silos, data fragmen-

EXHIBIT 20 | Four Types of Players Differentiate Their Paths to Smart Transformation Based on Respective Advantages, Among Which Integrated Players are Likely to Win



tation, legacy IT systems and a cumbersome procurement process that puts too much emphasis on cost effectiveness. All these factors significantly limit the potential of traditional players to achieve data-driven smart transformation.

- Integrated players:** featuring a wider product mix and more objective investment advisory services than traditional players, third-party WMers like Charles Schwab and Lufax can provide a wide range of services across online and offline channels. They are well-rounded competitors who can provide end-to-end solutions like traditional players and achieve organizational and governance excellence on the same level as traffic-based players. Generally speaking, integrated players are better positioned than traffic-based players to compete with traditional financial institutions.


Looking into the future, vertical players and traffic-based players are more likely to collaborate with traditional players and integrated players to achieve synergy. This trend has emerged independently in places around the world. For example, Ant Financial, China's leading traffic-based player, announced in 2019 that it was set to establish a joint venture with Vanguard. The goal was to combine the strengths of Ant Financial in traffic, data, and technology with the experience of Vanguard in wealth management, so as to offer clients easily accessible wealth investment advisory services. Meanwhile, leading vertical players in robo-advisory services like Scalable and SigFig have partnered with traditional players like ING and BlackRock to develop 2B solutions.

On the one hand, collaboration is crucial for creating synergy and enhancing the ability to provide end-to-end solutions. On the other hand, WMers should develop and enhance capabilities in data aggregation, data application, and data governance to consolidate competitive advantages. To be more specific, they need to connect or build corporate systems bearing in mind the principle of open collaboration, reshape the end-to-end customer journey with customers put first, identify use cases, and reinvent their organization and culture.

5. Sustainable Development: How to Tackle Regulatory Challenges with a New Approach and New Tools

Over the past few years, amidst many new technological developments such as mobile payments, the pioneering spirit of innovative companies has driven the rapid growth of the market through groundbreaking technological innovation. (See Exhibit 21.) However, these new technologies also bring regulatory challenges. Regulators have sought to strike a balance between propelling innovations while at the same time ensuring risks are properly handled.

EXHIBIT 21 | Regulations Can be Further Improved on Fronts of Data Privacy, Robo Qualification, AI Interpretability/Accountability, and Tech-Generated Fraud

	Data privacy	Robo qualification	Interpretability and accountability	Tech-generated fraud
Leading practices	U.S. , EU & China	U.S. & Australia	U.S. & EU	U.S.
 Regulatory focus	Covering the entire process of data collection, storage, and usage <ul style="list-style-type: none"> • Collection: WMers must acquire direct authorization from users and disclose the purpose • Storage: use reliable encryption methods and standby system to ensure data security • Usage: gain users' consent and keep the users informed 	Institutions, not robo-advisors, are subject to regulation <ul style="list-style-type: none"> • Reviewing dimension I - financial service capabilities: standard professional financial service capabilities as prerequisite • Reviewing dimension II - technology capabilities: such as the number of technological staff, description for algorithm, data and privacy protection scheme, risk management mechanism, etc. 	Two models for interpretability <ul style="list-style-type: none"> • Internal design: algorithms designed to be explicable • External observation: set up external monitoring to explain algorithms' decision-making logic Three focus for accountability <ul style="list-style-type: none"> • Cover the whole process from technological development to application • Establish protocols to determine liabilities and compensation • Encourage the creation of an internal control system 	Emergence of tech-generated fraud doesn't mean we should ban tech innovation, but instead: <ul style="list-style-type: none"> • Address tech-generated fraud with tech upgrade • Strengthen user education to help immunize them from tech-generated fraud • Establish comprehensive regulatory mechanisms to cope with fraud, such as stress tests, contingency plans, periodic checks, and tech combat training, etc.

Sources: Literature research; BCG analysis.

5.1 Data Privacy and Security: How to Handle the Double-edged Sword of Big Data?

With the maturity and implementation of smart technologies such as AI and big data, governments and corporations are increasingly reliant on big data analytics for decision-making and designing easy-to-use products. However, threats posed to data security and breaches of privacy have made many appearances in the news. In March 2018, tens of millions of Facebook accounts were reported to have suffered from a security breach due to a third-party institution, evoking major cyber-security concerns in the US.

Many countries have **established or amended cyber-security regulations** by defining: (a) **the rights of the data subject**, including the right to be informed, right of access, right to object, right to be forgotten, and right to correct; (b) **the obligations of data users and collectors**, including sending prior notification and obtaining prior consents, taking measures to protect data, record filing, as well as reporting and handling incidents; (c) **the responsibilities of regulators**, including developing a filing system, defining legal liabilities of each party, and imposing penalties on errant behavior.

Following the enactment of the Privacy Act of 1974 by the US federal government, state administrations adopted stricter information protection rules. The EU's *General Data Protection Regulation (GDPR)* came into effect on May 25, 2018, and it significantly enhanced the overall level of cybersecurity in EU countries. In May 2019, as a supplement to the *Cyber Security Law*, the Office of the Central Leading Group for Cyberspace Affairs (CAC) of China promulgated the *Draft Measures for Data Security Management*, which stipulates technical specifications and best practices for data security.

WMers possess a very large amount of sensitive user data about personal wealth, hence institutions need to build a reliable system to ensure that data are not compromised. Firstly, they must acquire direct user authorization before data collection and disclose the purpose of the collection to the user. Secondly, they must use safe and reliable methods for data storage, such as cloud storage and blockchain. Real-time supervision as well as a standby system with thorough emergency protocols must be established. Lastly, they must acquire authorization from the original data owners before using and sharing relevant personal information. When transferring data to different countries, WMers must strictly obey the regulations of both jurisdictions.

5.2 Granting Permits: How to Regulate Robo-advisory Services?

After the launch of “Machine Gene Investment” by China Merchants Bank (CMB) in 2016, more and more banks, funds, brokers, and third-party WMers have offered robo-advisory services. However, the rapid expansion of the market has led to a number of potential problems, such as a large variance of quality for products and services on offer. To combat these potential flaws, the *Guiding Opinions* introduced in 2018 requires institutions to acquire an investment advisory certification before starting to provide robo-advisory services, to fully disclose and report the main parameters of the algorithmic model, and to use digital technologies in a more standardized manner. Therefore, it is necessary to improve auditing and supervision systems to help support and sustain smart transformation in the WM industry.

Many developed countries have developed full-fledged regulation for robo-advisory services. In the US, robo-advisory services fall under the supervision of the Securities and Exchange Commission (SEC). The SEC requires robo-advisors to acquire Registered Investment Advisor (RIA) certification in the same way regular investment advisory companies have to. Robo-advisors must also conform to all relevant regulations, such as the Investment Advisers Act. For example, Wealthfront and Betterment, two SEC-registered leading US robo-advisors, have been required to submit the same information as traditional investment advisers, including details of service methods, portfolio composition, ways in which to maximize client profit, etc. Currently, Australia is the country with the most sophisticated robo-advisory entry standards. There, all robo-advisors must obtain an Australian Financial Services License (AFSL) by specifying details of products offered (fund, equity, insurance, etc.) and services provided (investment advisory, trading, discretionary account, etc.), fulfilling the necessary relevant traditional financial services qualifications and meeting additional technical, accountability and market entry standards. These standards include staffing of professional and qualified personnel, algorithm monitoring, information filing, internal control mechanisms, compensation mechanisms, etc.

In summary, the assessment for robo-advisory qualification should be based on institutions' technical capabilities, while retaining professional financial services capabilities as its core. Firstly, **it must be recognized that institutions, instead of robots or algorithms, are subject to regulation**, and institutions will be punished for any regulatory breaches. Secondly, institutions need to **provide suitable financial sales and advisories** and follow relevant rules. Lastly, they must also prove to have **sufficient technological expertise and capabilities** in algorithm design, data privacy protection, risk control, and compensation schemes.

5.3 AI Black-box: How to Minimize Ambiguity and Maximize Accountability?

The use of AI algorithms will inevitably bring “black-box” issues to the fore if AI applications remain unexplainable and developers unaccountable. The black box undermines the trust of both regulators and the public, therefore significantly hindering the mass promotion of the technology. In the US in May 2016, an electric vehicle in autopilot mode crashed into a truck and killed the electric car driver upon impact. Incidents such as this raise questions as to whom should be held responsible when a system that involves both humans and AI should deviate from its intended course. In fact, it is almost impossible under the existing framework to apportion blame for accidents caused by AI. Consequently, every time there is an AI-related accident, the same questions will come up. What went wrong? Who should be held accountable?

Two common methods can be adopted to improve AI interpretability. **(1) Develop algorithms with built-in interpretability.** **(2) Introduce external solutions that can extract the key process and data from AI to explain the logic of its operation.** In September 2018, IBM introduced a technological solution to bring transparency to AI. By monitoring and analyzing changes with pre-set indicators from an external point-of-view, It attempts to explain AI decision-making in real-time.

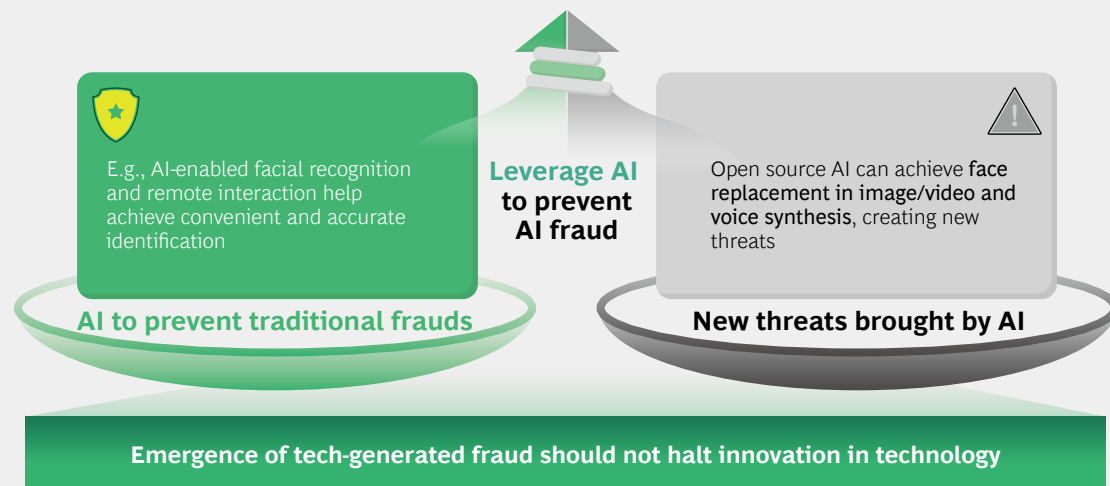
AI accountability eventually lies with humans and institutions, not technology itself. An AI accountability mechanism needs three chief features: **first, end-to-end supervision and monitoring from design and sales to applications.** China promulgated the *Development Planning for a New Generation of Artificial Intelligence (DPAI)* in July 2017, which explicitly required full-scale supervision for AI, and proposed the implementation of an AI safety certification; **second, a system to determine liabilities and compensation.** Mutually recognized standards should be established to determine the legal and moral responsibilities of different parties in the event of an accident. For example, the EU released *Ethics Guidelines for Trustworthy Artificial Intelligence* in 2018, which stressed the importance of a mechanism that makes AI suppliers the primary party responsible for the consequences of AI accidents and also offers different compensation schedules for different levels of wrongdoing; **third, arouse awareness from institutions to impose internal risk control.** Although external supervision is very important, AI developers themselves are actually the first line of defense. Microsoft, Ping An, and other institutions have all set up AI ethics committees to actively control AI-related problems, such as biases and moral issues as well as privacy violations.

5.4 A New Conundrum: How to Prevent Tech-generated Fraud?

Although commonly used to prevent fraud and improve risk control, smart technologies may also be exploited by criminals.

Anti-fraud technology should grow and evolve with the fight against tech-generated fraud. Upgrade of technology, effective user education, and proper control systems are necessary to counter the new threats of smart technologies. Firstly, **technological advances** represent the best way to ensure that fraud is prevented from the source. Researchers are developing tamper-proof labels and techniques to detect AI-powered face-swapping and speech synthesis. (See Exhibit 22.) In 2019, the American research institute DAPRA developed the first face-copying AI detection tool and achieved an accuracy of 99%. Secondly, **users need to be educated** and made aware of the characteristics of AI fraud. Lastly, **comprehensive regulatory mechanisms are needed to cope with new**

EXHIBIT 22 | Anti-Fraud Technologies Should Continuously Advance in the Fight Against Tech-Generated Fraud, Taking AI as an Example



Sources: Literature research; BCG analysis.

tech-generated frauds, including stress tests, emergency plans, periodic spot checks, and technical training.

5.5 Positioning Upgrade: From Passive Supervision to Active Guidance

In this era, regulators in global financial centers should pivot from a passive to a more active posture, engaging in managing risks while also encouraging innovation. **Regulators have already adopted this stance in highly developed financial markets such as Singapore and the UK, where the market is more vibrant with significant use of advanced technology.**

Lead the technological innovation: stay on the edge of technology development, offer guidance and standards for application of new technologies as early as possible, and build sandboxes to encourage safe experimentation.

- **Regulators should stand at the frontier of technological exploration with timely instructions.** The Monetary Authority of Singapore (MAS), for example, launched guidelines about the implementation of new technologies such as blockchain, open API and AI at an early stage in an effort to guide research and application. These guidelines include *Finance-as-a-Service: API Playbook*⁴³ issued in November 2016, rel-

⁴³ *Finance-as-a-Service: API Playbook* issued by ABS and MAS

evant regulations on ICO 44⁴⁴ issued in August 2017, AIDA⁴⁵ issued in November 2018 and *A Proposed Model AI Governance Framework*⁴⁶ issued in January 2019. Taking AIDA as an example, its principles clearly enunciated policies that tackle fairness, ethics, accountability, and transparency of technologies, drew appropriate boundaries, and indicated the likely direction of future development.

- **Implement sandboxes for small-scale tests and accelerated technological applications.** As early as November 2016, drawing lessons from the UK, MAS set up a regulatory sandbox, aiming to help organizations promptly launch innovative products and services with huge consumer benefits. The applications will fail to clear the bar if they cannot prevent sandbox abuse: one circumstance is that the new technology is already present in the Singapore market in some form and/or if applicants fail to prove that correct procedures and due diligence have been followed. The other is that applicants fail to prove that they have conducted a detailed review in the experimental environment and confirmed the legitimacy of the product based on current rules and laws. As of December 2018, over 150 companies⁴⁷ have benefited from the sandbox policy.

Empower all kinds of institutions: build innovation incubators, improve clarity of policies towards innovations and explore intelligent regulatory system.

- **Establish incubators and enable innovation.** As early as early 2014, the Financial Conduct Authority (FCA) of the UK established Project Innovate to support innovation in institutions. FCA communicated its aims and relevant guidelines to financial institutions through frequent seminars and also answered questions about compliance when designing new applications. As of April 2019, Project Innovate had received over 1,600 applications and provided service to more than 700 institutions⁴⁸.
- **From supervising rules to supervising data, achieving real-time, accurate and comprehensive intelligent supervision.** Under traditional rule-based regulation, financial institutions needed to invest large amounts of labor and resources to understand rules, but still faced the possibility of misinterpretation. In 2018, the FCA

⁴⁴ *A Guide to Digital Token Offerings*.

⁴⁵ *Principles to Promote Fairness, Ethics, Accountability and Transparency (FEAT) in the Use of Artificial Intelligence and Data Analytics in Singapore's Financial Sector*.

⁴⁶ On 23 January 2019, the PDPC released its first edition of *the Model AI Governance Framework (Model Framework)* for broader consultation, adoption and feedback.

⁴⁷ Source: official statistics from MAS.

⁴⁸ Source: official statistics from FCA.

launched a test run of its Digital Regulatory Reporting⁴⁹ system in collaboration with major financial institutions including Barclays, Credit Suisse, and Lloyds. The system leverages smart technologies such as machine learning to capture data from financial institutions to build regulatory reports. If implemented, it could not only provide regulators with real-time and accurate market data, but also allow firms to identify potential risks in a timely manner, reducing compliance costs and the negative impact engendered by non-compliance.

⁴⁹ *Call for Input: Using technology to achieve smarter regulatory reporting* issued by FCA in February, 2018.

Acknowledgments

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About BCG China Financial Services Institute

Having served the Chinese market for over 25 years, BCG has established a leading position in financial services, particularly the wealth management and FinTech sectors. BCG's financial institutions team has a network of experts on wealth management worldwide and a proprietary global wealth management database (covering nearly 200 large retail banks across countries and regions). In addition, BCG has been doing in-depth studies about China's wealth management. Meanwhile, in FinTech and digital areas, we have collaborated with many global and Chinese leading financial institutions. In the past 18 years, BCG has published 18 global wealth reports and 10 China wealth reports. Drawing on its global experience and insights about the Chinese market, BCG puts forward operational advice and creates substantive values for clients, which is highly appreciated by clients and the market.

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About Lufax Holding

Established on December 2, 2014, Lufax Holding Ltd (“Lufax Holding”) is a prominent global FinTech enterprise.

Lufax Holding operates a world-leading comprehensive online wealth management platform, offers consumer finance services, and provides turnkey technological solutions for financial institutions. These businesses and services feed into one another and are integrated within the Lufax Holding ecosystem.

Driven by its core competitiveness of “finance + technology”, Lufax Holding infuses financial DNA and advanced technologies in helping individual investors, enterprises, and financial institutions manage their assets and finances. Through these efforts, Lufax Holding endeavors to bolster financial inclusion, support the real economy, and foster innovation in the finance sector.

About Lufax

Shanghai Lujiazui International Financial Asset Exchange Co., Ltd. (“Lufax”) is a world-leading comprehensive online wealth management platform. Lufax is an associate of Ping An Group, one of the world’s largest retail financial services conglomerates and insurance giants. Lufax was founded in Shanghai in September 2011, with a registered capital of RMB837 million.

The company leverages its global financial footprint and technological innovations in building an underlying robust risk management apparatus, and providing institutions, enterprises, and investors with secure, professional, and efficient financial information and services.

Lufax’s online wealth management marketplace lu.com was launched in March 2012 as a holistic wealth management services hub for individual investors. As of December 2019, lu.com has more than 44 million registered users and offers more than 6,000 products.

In addition to serving individuals investors, Lufax works closely with hundreds of financial institutions in exploring use cases for broader FinTech application and empowering the traditional finance sector with its technological capabilities and operational expertise.

