

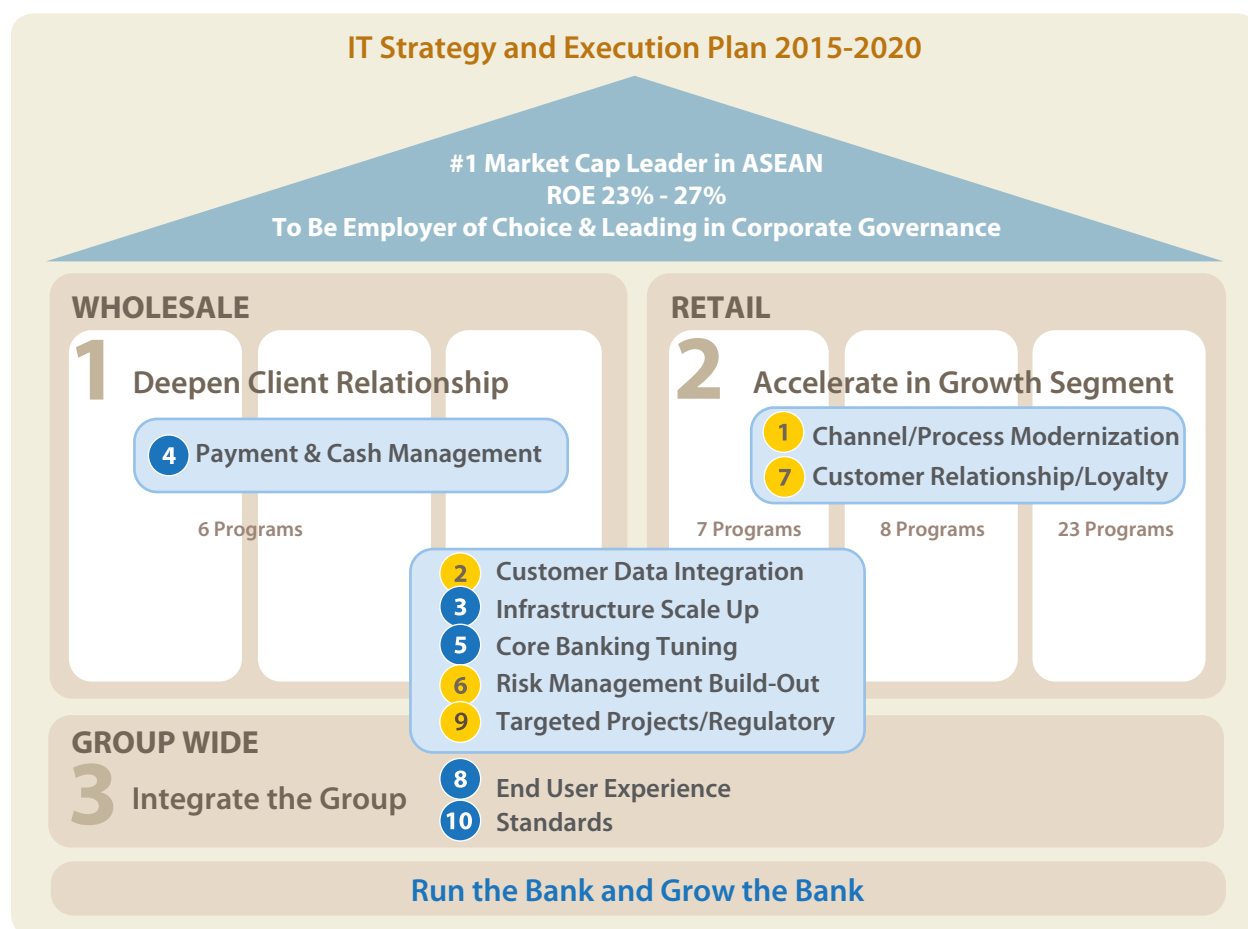
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Information Technology

"Bank Mandiri Information Technology (IT) Transformation Framework utilize as guidance in IT development with reliable, robust, agile, secure and efficient concept in supporting short-term and long-term business needs"

IT Development Strategy

Bank Mandiri's IT Development Strategy are based on the IT Strategy and Execution Plan (ISP) 2015-2020 consisting of two grand strategies, supporting vision and fixing the basics. There were five programs under the supporting vision strategy, namely Channel/ Process Modernization, Customer Data Integration, Risk Management Build-Out, Customer Relationship/Loyalty and Targeted Projects/Regulatory. Fixing the basic strategy advocates 2015-2020 grand strategy of Bank Mandiri especially in Integrate Across Groups. Fixing the basic strategy includes five programs namely Infrastructure Scale-Up, Payment & Cash Management, Core Banking Tuning, End-User Experience and Standards.



Economic slowdown in 2016 was the trigger for the IT of Bank Mandiri to shape down and move forward with its system stability, implemented through IT Transformation Strategy with the vision "Reliable, Robust, Agile, Secure and yet Efficient IT Management to support short-term and long-term business needs".

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IT Transformation Strategy consisted of three points as follows:

3. Infrastructure & Security

1. Problem Management

- Keep the lights on: 24/7 automated monitoring, problem handling supported by appropriate experts, accuracy of recovery time, and reliable backup systems.
- Tidy up the basics: daily monitoring on production issue, disciplinary on permanent fix and solution propagation in preventing similar matter to other system, check the status on all applications, capacity planning to maintain system reliability.

2. Development

- Synergy with working unit in excavating the development system requirement, utilize Agile Methodology concept using micro services architecture for in-house development team, detailed and efficient testing, staging release environment to alpha release beta release and production.
- Mandiri Group synergizes through technology investment optimization, execution of IT architecture roadmap, comprehensive prioritizing IT strategic initiative, accommodating disruptive technology.

- Infrastructure: 3-site data center standard implementation to support the needs of high availability for critical application, roadmap private cloud execution, fulfillment of branches and ATMs backup link, BYOD implementation to gain more flexible working environment.
- Security: enhancement of IT Security in transactional and operational activities in form of end point, application, infrastructure, data and perimeter and network security to ensure the security of both internal and external IT services users.



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IT Organization

Bank Mandiri IT Management in 2016 was under Director of Digital Banking and Technology and IT Senior Executive VP that focused on IT management. Bank Mandiri IT management working unit consists of 4 units namely:

1. **IT Applications Development**, system developer working unit.
2. **IT Applications Services**, existing management working unit.
3. **IT Strategy & Architecture**, IT development strategy working unit.
4. **IT Infrastructure**, IT infrastructure development working unit.

Human resources development of IT has played an important role for the success of Bank Mandiri's IT development and management. Implementation of IT Officer Development Program (ODP) 2016 class was one method to fulfill HR of IT, with a focus to educate future leaders who are ready to adapt in IT working environment of Bank Mandiri. IT ODP format consisted of in class training, case studies, thematic OJT, talk shows, simulation training and lecturing visit, entirely designed in accordance with the conditions of the IT and technology trends. In addition, the existing IT employees also continue to develop its capabilities through certified training. Some IT certifications that have been executed in 2016 included Certified Ethical Hacker, ICT Project Manager Professional Certification, Certification of Enterprise Architect Competency, CISA, COBIT 5, ISO 9001: 2015 training and IT Quality Assurance training.

IT Governance

IT governance has a crucial role in guide the planning, development, and IT operations in order to support business needs, provide excellent service to customers, and reliability of banking operations. We are working to improve the quality of IT governance through periodic reviews of the policies and procedures referred to in regulations and the industry's best practices by keeping in mind the character and the Bank's business strategy. Throughout 2016, the Bank has been adjusting policies and procedures for its IT governance, with details as follows:

1. Information Technology Standard Operating Procedure

Guidelines for IT governance begin at the planning, development, operational management and security systems at the bank to be in line with legislation and best practice that is aligned with the improvement of business processes by taking into account the principle of confidentiality, integrity, availability, reliability, continuity, and compliancy by taking the principles of effectiveness and efficiency.

2. Information Technology Planning

Working unit guideline in preparing information technology planning which includes Information Technology Strategic

Plan, Standard for Information Technology, Annual Information Technology Planning and Research and Strategic Studies on Information Technology.

3. Information Technology Project Management

Provide guidance at the development stage of IT Strategic Initiatives Project so that every process in the development phase are standardized in the implementation while maintaining the quality of each of the Project.

4. End User Computing (EUC) Management

Working unit guideline in developing an application system with End User Computing mechanism. Updating of the procedures carried out in the framework of the provision of regulatory alignment and process improvement.

5. Information Technology Application User Management

Working unit guideline related in the matter of security protection and access permission management into the main gate of information access to prevent on the risk of leakage, damage, inaccuracies, loss and misuse.

6. Information Security Standard Management

In order to improve the security of IT services, periodic reviews of security baseline are conducted regularly as the reference of IT services security. Through these efforts, the security loophole risk on the Bank Mandiri system / application can be mitigated earlier.

IT Program Implementation In 2016

Throughout 2016, the IT bank has implemented several strategic IT initiatives in order to accelerate business of Bank Mandiri, as follows:

1. Channel Enhancement & Transaction Processing

- Bank electronic channels development on individual segments through the implementation of multivendor ATM to bring a new experience of transaction in Mandiri's ATMs. Development of new Internet Banking and Mobile Banking on a single platform has started in 2016 and pushes forward the concept of developing a unified and seamless experience for each customer transaction.
- Improvement of Supply Chain Management for wholesale segment and implementation of sector-specific solution for the healthcare industry and the port industry. The development of electronic channel for the Government sector, among others through the implementation of Kartu Tani (in cooperation with PTPN). Through Bank Mandiri agent, there were improvements on pilgrimage registration flow on Siskohat and feature enhancements for contribution payment of BPJS Kesehatan.
- Creating a reliable end-to-end business process for corporate customers through Mandiri Cash Management enhancement.

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2. Data Services & Customer Onboarding

- Implementing the first phase of Master Data Management in 2016 to consolidate the data of all Bank Mandiri customers. As well as maintaining data integrity for reporting through implementation Bank wide Report Integration and Executive Information System (EIS) enhancement.
- Improvement on the quality of performance and capacity of the collection system and the fulfillment of Integrated Processing System (IPS) redundancy in the Disaster Recovery System (DRC).

3. Risk Analysis & Fraud Management

- Strengthening the Bank's risk management through the development of Enterprise Risk Management (ERM) to accommodate the implementation of Basel II and III in addition to enhancing the development of New Asset & Liability Management.
- In 2016 the development of Fraud Risk Management System using the new SOA architecture has started.

4. Core Banking Tuning, Sales & Relationship Service

- Development of joint financing applications to support the vehicle leasing business (Mandiri Utama Finance).
- Complaint Handling Social Media Implementation process (capture, categorize and distribute) customer complaints submitted through social media.
- Fiestapoin loyalty program development to be accessed (inquiry and redeem) through mobile banking and internet banking.

5. Network Enhancement & Internal Support

- Implementation of network devices for data center backup and upgrading branches network devices.
- Advancement of transaction processing and critical system availability with the implementation of the monitoring availability system, including alerts for system infrastructure status threshold.

Bank Mandiri IT infrastructure contained in the Data Center (DC) Plaza Mandiri and 2 Disaster Recovery Centers (DRC) in Rempoa and Borneo (3-site Data Center). DRC Rempoa is an investment that began in 2015, built on the assets of the Bank and embrace the concept of Tier-3 Data Center (Uptime Institute). In 2016 DRC Rempoa has officially become operational and backup over DC Bank Mandiri, operational Rempoa DRC has been reported pursuant to the regulator.

As our commitment to deliver excellent support to the Bank's business, IT business unit Bank Mandiri implements certified service standards, namely:

1. ISO 9001:2008 for the Operations and Development of Data Center, DRC, IT Security & Infrastructure.
2. ISO/IEC 20000-1:2011 for the Provision of IT Service Management System to Internal Customer.

IT Synergy for Subsidiaries

As the realization of the vision Integrate the Group, in 2016 IT of Bank Mandiri initiated cooperation with the subsidiaries to jointly undertake the development of technologies to build Mandiri Group with services integration that are reliable, secure, and has the technology for optimization of technology investments.

Some output of synergy that have been successfully executed in 2016, namely:

1. The use of **ATM Switching with Bank Mandiri Taspen POS** (Mantap) make transactions of Bank Mantap customers can be served at 17 thousand Bank Mandiri ATM machine without any additional investment in the Bank Mantap.
2. **Co-location Mandiri Group Data Center**, through the placement of subsidiaries data center in DRC Rempoa with the aim for space optimization, cost efficiency and risk management.
3. **Subsidiaries Synergy Initiative Governance** through the preparation Mandiri Group Principal Guidelines as the basis for IT synergy cooperation of Mandiri Group subsidiaries, as well as the preparation of the Memorandum Procedure for filing synergy initiatives.

IT Investment

Throughout 2016, the Bank has made IT investments. Detailed data is described in the Chapter "Management Discussion and Analysis" with sub-chapter discussion "Investment and Materials Association of Capital Goods".

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2017 Technology Development Plan

In 2017 the Bank launched several IT concept technology developments to accelerate the Bank's business following the corporate strategy as follows:

- 1. Improve distribution network and develop digital** proposition in the retail segment through the Bank at Work development capabilities, improved branch delivery system, development of Gen Y Saving Account, New Internet Banking and Mobile Banking, and enhance customer complaints management on social media.
- 2. Winning the wealth segment, deepen relationships, and revamp cash management capabilities** by improving Mandiri Investment Access(MAKSI), the development of applications to support the trade and foreign exchange transactions, as well as enhance Mandiri Cash Management to serve the needs of corporate customers.
- 3. Electronic channel synergy and enhanced government payment system** to support the Merah Putih ATM government and the National Payment Gateway, distribution of Kredit Usaha Rakyat (KUR), government sector development and refinement of branchless banking solutions.
- 4. Streamline Non Collateral Loan (KTA) and Multipurpose Micro Credit (KSM)** proposition and sales process and Small Medium Enterprise (SME) Solution through the development of micro distribution network, enhanced Retail Loan Originating System (LOS) and develop the capability to support the Indonesia e-Commerce market.
- 5. Build advanced analytics and Customer Relationship Management (CRM)** through the implementation of Big Data, Master Data Management (MDM) and Marketing Engine, strengthening fraud analysis with the consummation of Fraud Risk Management Strategy (FRMS) as well as maintaining the integrity of the reporting of data through Bank wide Report Integration.
- 6. Credit Portfolio Management Strategy and Streamline Business Process** through the development of Retail Business Process Engineering, implementation of the Integrated Risk Management Mandiri Group (IRMG) and early detection system solutions for micro segment.
- 7. Build HR Capabilities and Strengthen Training Program** through the development of SAP capabilities, Culture Excellent Scoreboard and the Learning Management System.