

## Module Outline

<b>Module Title:</b>	Technology Management and Innovation in Banking
<b>QF Level:</b>	Reference is being taken and pitched to HKQF Level 5
<b>QF Credit:</b>	30 credits for Professional Diploma of Certified Banker (15 contact hours and 3 examination hours)
<b>Teaching/Training &amp; Learning Activities:</b>	Training Class
<b>Pre-requisite:</b>	N/A

### Module Objective:

This module aims to provide the learners comprehensive knowledge on the latest development of IT system and financial technology. They are expected to relate the application and implications of the IT systems and financial technology including the relevant regulations and security control to the bank and finance area.

### Module Intended Learning Outcome (MILO) & Unit of Competencies (UoCs)

Upon completion of the module, learners should be able to:

MILO1:	Assess and analyze the latest development and market trends of IT systems and financial technology and associate their implications to identify the technology needs of the banks or financial institutions;	
MILO2:	Evaluate different kinds of financial technology, IT and security infrastructure to enhance and optimize the effectiveness and efficiency of IT platforms and services;	
MILO3:	Plan, design and implement data analytics based on risks level, technology regulatory requirements and the effectiveness of the security measures;	
MILO4:	Manage and monitor the system development projects in according to system development standards and requirements; and	
MILO5:	Monitor the IT operations and services and identify the potential risks for taking actions to ensure smooth operations and risk mitigation.	

### Assessment Activity

Type of Assessment Activity	MILOs	Weighting (%)
Examination	MILO 1-5	100

## Examination Format and Duration

Time allowed: 3 hours

The examination consists of 50-60 multiple choice questions and 2 out of 3 essay questions

Passing mark for this subject is 60%

## Syllabus

<b>Chapter 1: Overview of Information Systems and Technology Management</b>	
<b>1</b>	<b>Transformation of the Banking Industry</b> 1.1 - The next generation of the banking industry 1.2 - Partnership and incubation 1.3 - Emerging 'banking groups'
<b>2</b>	<b>Impacts of Disintermediation &amp; the Shared Economy</b> 2.1 - What is 'Banking' and 'Banking Groups'? 2.2 - Paradigm shift of banking for evolving banking needs and client demographics 2.3 - Roles of IT services and talents in the evolving banking industry
<b>3</b>	<b>Open Up Banking</b> 3.1 - Banking as a Service (BaaS) 3.2 - Private and open API banking 3.3 - Changes in the banking business architecture and industry framework
<b>4</b>	<b>Banking on the Cloud</b> 4.1 - Cloud architecture 4.2 - Cloud deployment models
<b>5</b>	<b>Case Sharing on Facing the Challenges and Seizing the Opportunities Arising from the Banking Transformation Banking as a Service (BaaS)</b> 5.1 - Blockchain technology 5.2 - Innovation Lab 5.3 - Payment services 5.4 - Credit technologies 5.5 - Investment – fundraising 5.6 - Remittance services
<b>Chapter 2: Cyber Security and Data Privacy</b>	
<b>1</b>	<b>Regulatory framework and related regulations for technology management and cybersecurity e.g. HKMA SMP Technology risk management and risk management in E-Banking</b>
<b>2</b>	<b>Cyber Security Threats</b>

<b>3</b>	<b>Information System Security Management</b>
3.1	- Principles and general practices
3.2	- ISO/IEC 27001 Information security management system
<b>4</b>	<b>Cyber Security Regime</b>
4.1	- Enhanced Competence Framework (ECF)
4.2	- Cybersecurity Fortification Initiative (CFI)
<b>5</b>	<b>Cyber Security Technologies, Defence and Mitigations</b>
5.1	- Anti-DDoS and Security Operation Centre (SOC)
5.2	- Intelligence platforms, Security Information and Event Management (SIEM)
5.3	- Endpoints and mobile device management (MDM)
5.4	- Next-generation firewalls and virtual machine (VM) security
5.5	- Biometrics and multi-factor authentication
5.6	- Cryptography and data encryption standards and applications
<b>6</b>	<b>Data Privacy Considerations</b>
6.1	- Data privacy regulations in Hong Kong
<b>Chapter 3: Data Management, Analytics and Artificial Intelligence</b>	
<b>1</b>	<b>Big Data Analytics for Financial Services</b>
1.1	- Structured Data Analytics
1.2	- Unstructured Data Analytics
1.3	- Data Analytics in Retail Banking
1.4	- Data Analytics in Commercial Banking
1.5	- Data Analytics in Investment Banking and Treasury and Markets
<b>2</b>	<b>Big Data and Deep Learning Technologies</b>
2.1	- Data Pattern Recognition
2.2	- Predictive Analysis
2.3	- Machine Learning and AI
<b>3</b>	<b>Applications of Artificial Intelligence in Financial Services</b>
3.1	- Financial Risk Analysis
3.2	- Fraud Detection
<b>4</b>	<b>Credit Investigation Services</b>
4.1	- Consumer Credit Data
4.2	- SME Credit Data
4.3	- Capital Markets Credit Data
<b>Chapter 4: FinTech for Digital Banking and Service Channels</b>	
<b>1</b>	<b>Payment</b>
1.1	- Current interbank payment infrastructure
1.2	- Overview of emerging non-bank payment infrastructures
1.3	- Introduction of Stored Value Facilities (SVF) and regulations

1.4	- Functional comparison of conventional and emerging payment solutions in HK
<b>2</b>	<b>Remittance</b>
2.1	- Current remittance architecture
2.2	- SWIFT – history and recent developments
2.3	- Emerging remittance technologies
2.4	- Functional comparison of conventional and emerging remittance solutions in HK
<b>3</b>	<b>Chatbots</b>
3.1	- Technology overview of Chatbots
3.2	- Client services channel
3.3	- Revolution of banking process re-engineering
3.4	- Regulatory and compliance considerations of Chatbots in banking
<b>4</b>	<b>Robot Advisory</b>
4.1	- Overview of conventional retail investment platforms
4.2	- Theoretical review of robo advisory service
4.3	- Robo Advisor versus Human advisor in retail investment
4.4	- Regulations and suitability of robo advisory services in retail investment
4.5	- Introduction of social investing
4.6	- Introduction of algorithm trading in institutional investment
<b>5</b>	<b>Digital Branch</b>
5.1	- Online-to-offline client servicing
5.2	- Roles of branch staff, location and facilities in digital branches
5.3	- Branch banking officers and tellers
5.4	- Retail investment advisors
5.5	- Premier banking services
5.6	- Commercial banking services
5.7	- Increasing Digital Penetration – Change in Roles of Conventional Branches
<b>6</b>	<b>Digital Currency</b>
6.1	- Technological overview of digital currencies
6.2	- Development of digital currencies in Hong Kong and internationally
6.3	- Roles of central banks, issuing banks and payment channels
6.4	- Cashless transactions in retail payments
6.5	- Regulatory and compliance considerations
<b>7</b>	<b>Distributed Ledger Technology</b>
7.1	- Technological overview of Distributed Ledger Technology
7.2	- DLT versus conventional distribution systems
7.3	- Cross-institutional banking workflows
7.4	- DLT applications and future directions
7.5	- Regulatory and compliance considerations
<b>8</b>	<b>Mobile First and Mobile Only</b>
8.1	- Client demographics and banking behaviour
8.2	- Mobile banking versus internet banking versus banking at a branch

8.3	- Business analytics in mobile banking
8.4	- Overview of mobile and related technologies: HTML5, push technologies, open banking API, and mobile devices
<b>Chapter 5: Compliance with information Technology</b>	
<b>1</b>	<b>Overview of regulatory technology (RegTech)</b>
<b>2</b>	<b>Transaction surveillance and AML</b>
2.1	- Application of data analytics
2.2	- Privacy and the use of analytics
<b>3</b>	<b>Know-your-client (KYC) and onboarding technologies</b>
3.1	- Aggregation of identity
3.2	- Biometric authentication
<b>4</b>	<b>International efforts</b>
4.1	- Joint Financial Intelligence Unit (JFIU)
4.2	- Financial Action Task Force on Money Laundering (FATF)
<b>Chapter 6: Business Analytics, System Projects, and IT Operations</b>	
<b>1</b>	<b>Overview of system application development and project management methodologies</b>
1.1	- SDLC
1.2	- Agile Development
1.3	- Rapid application development (RAD) and prototyping
1.4	- Project management inventory and tools
1.5	- Quality assurance, testing, and change management
<b>2</b>	<b>Enterprise architecture</b>
2.1	- Enterprise architecture versus application design
2.2	- Service oriented architecture (SOA) and industry frameworks
2.3	- Technological stack, inventory, and tools
2.4	- User-centric design (UCD)
<b>3</b>	<b>Vendor and service outsourcing management</b>
3.1	- Principles of IT outsourcing
3.2	- Inception and exit strategies
3.3	- Service level agreement (SLA)
3.4	- Regulatory and compliance considerations
<b>4</b>	<b>Professional development</b>
4.1	- Project management: PMP
4.2	- System service management: ITIL, PRINCE2
4.3	- Business analysis: IIAB
4.4	- Cyber security: CISA, CISSP

**Essential Readings:**

- HKIB, Study Guide - Technology Management & Innovation in Banking (2018)

**Supplementary Readings:**

- Marakas, G.M. and O' Brien, J. (2008). Introduction to Information Systems (16th ed.). Irwin/McGraw-Hill
- Chris Skinner. Digital Bank: Strategies to Launch or Become a Digital Bank, ISBN 978-9814516464
- Efraim Turban and Linda Volonino. (2011). Information Technology Management (8th ed.). Wiley

**Further Readings:**

- Chaffey D. and Wood S. (2010). Business Information Management – Improving performance using information systems (2nd ed.). Prentice Hall

**For more details, please refer to further reading session at end of each chapter.**