DATA ANALYTICS PROGRAMME

EMPOWERING DATA LEADERS

A case study by:
China Construction Bank
HKU Business School
**TABLE OF CONTENT**

<table>
<thead>
<tr>
<th>Page</th>
<th>Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>03</td>
<td>Executive Summary</td>
</tr>
<tr>
<td>04</td>
<td>Partnership</td>
</tr>
<tr>
<td>05</td>
<td>Part I: Challenge</td>
</tr>
<tr>
<td>10</td>
<td>Part II: Commitment</td>
</tr>
<tr>
<td>17</td>
<td>Part III: L&amp;D Initiative</td>
</tr>
<tr>
<td>29</td>
<td>Part IV: Impact</td>
</tr>
<tr>
<td>39</td>
<td>Part V: Reflection</td>
</tr>
</tbody>
</table>
China Construction Bank Corporation (CCB), the leading large-scale commercial bank in China, is committed to developing itself into a world class banking group with top value creation capability.

In the digital era, CCB faces the challenges posed by customers and new competitors. To maintain the leading position, CCB took the lead in digital transformation through tapping into the value of data to satisfy customers, as well as increasing new profitability and improving corporate efficiency. Digital talents are the most critical resources and key driving forces for this transformation. CCB partnered with HKU Business School to develop a bank-wide Data Analytics Programme for high-potential talents working in data-related fields. The objective of the programme is to train digital talents to lead cross-functional teams, to conduct customer-centric innovations and achieve refined management by using data-driven approaches – all in all for a better digitalized working environment.

HKU Business School has developed a 14-month bespoke programme for 112 CCB’s high-potential digital talents. Commenced in late 2020, the programme was designed based on the framework of HKU’s Master of Science in Business Analytics programme and delivered in online and offline hybrid mode. The delivery of the programme adopts a mixture of lectures, seminars, case studies, group modeling projects and industry sharing sessions - ensuring solid foundation and application of knowledge at workplace. A crucial part of the programme was the Capstone module, in which participants were assigned into 10 modelling teams to apply what they had learned to solve real-world data problems. The capstone projects were further refined and deployed at CCB – accelerating CCB’s innovation-led development.

The Data Analytics Programme achieved significant result. It not only achieved the expected course objectives of educating key data analysts for CCB’s digital operations, but also set the benchmark among peers and produced a positive and far-reaching impact – for CCB, and the banking industry in Hong Kong and Mainland China.
PARTNERSHIP

CHINA CONSTRUCTION BANK (CCB)

China Construction Bank Corporation, headquartered in Beijing, is a leading large-scale commercial bank in China. At the end of 2020, the Bank’s market capitalisation reached US$191,889 million, ranking fourth among all listed banks in the world. The Group ranks second among global banks by Tier 1 capital. The Bank provides customers with comprehensive financial services. With 14,741 banking outlets and 349,671 staff members, the Bank serves hundreds of millions of personal and corporate customers. The Bank has subsidiaries in various sectors, including fund management, financial leasing, trust, insurance, futures, pension and investment banking, and has more than 200 overseas entities covering 31 countries and regions.

HKU BUSINESS SCHOOL (HKUBS)

The University of Hong Kong is a comprehensive university with an international reputation for research, ranking 22 in the 2022 QS World University Rankings. HKU Business School has earned high reputation in Asia, with EQUIS and AACSB accreditations. More than 90% of the professors and lectures have experiences learning or teaching in Western tertiary institutions, most of the faculty also have experience in consulting and serving as independent directors in private and public institutions. Since 1998, the Executive Education, HKU Business School has focused on providing executive trainings and leadership development courses for local, regional and international private and public institutions.
PART I

CHALLENGE
In the digital era, traditional commercial banks are faced with the challenges of changes in consumer behaviours and corporate business models. Accelerating technological innovation has brought new entrants and intensified competition within the global banking value chain. Moreover, emerging Fintech Companies focus on a certain banking service (such as loans, financial products and payments) to provide specialized and differentiated services. Besides, large technology companies such as Google and Alibaba are actively integrating financial services as a complement to its existing services. In addition, the organizational structure and management model of traditional commercial banks are also difficult to adapt to the rapidly changing environment.

To cope with the challenges, CCB actively practices “New Finance”, a concept of inclusiveness, openness and sharing; and it fully embraces the implementation of “Three Major Strategies” of House Rental, Inclusive Finance and FinTech. CCB developed a set of effective digital transformation methods with its characteristics in accordance with the basic logic of “building ecologies, setting up scenarios and expanding user base”.
TALENT, TALENT, TALENT

More than anything else, digital transformation requires talent. Having the right teams of technology, data, and process people who can work together, with a strong team of leaders who can bring about change, is critical to any organisation that are contemplating digital transformation.

The lack of talents was one of the key constraints that would impede the successful implementation of CCB’s digital transformation. The talent issues CCB faced centred around availability, depth and breadth:

- lack of project leaders experienced with leading digital projects;
- shortage of data talents at all levels, from head office business departments to branches;
- Insufficiency of all-rounded talents that are business-savvy, data-savvy, and technology-savvy.

These challenges were not unique to CCB. Across the banking industry,
- there were few high-quality and recognised learning and development initiatives at the time;
- there was no standard skill framework and certification mechanism catered to the banking industry in China;
- the applied research of advanced big data technology in banking was at its infant stage, resulting in limited application scenarios of frontier data technology in daily business operations.

For a large-scale bank like CCB with 14,741 banking outlets and 349,671 staff members across its operations, therefore, the availability, depth and breadth of talent at all levels must be addressed.
As such it was necessary for CCB to look into accelerating the talent development within the Bank by developing a development programme that aimed at:

- instilling digital way of thinking and developing skills in leading teams to implement digital transformation strategy;
- cultivating the culture of innovation and skills at all levels of the Bank;
- enhancing efficiency and unlocking the value of data across businesses.

In line with this recognition, CCB partnered with HKU Business School to design and deliver an innovative Data Analytics Programme targeting at high-potential talents across all functions and businesses.

HKU Business School is one of the top business schools in Asia. The Master of Science in Business Analytics is one of the highly sought-after programmes in Asia. In addition, the deep root of HKU Business School in one of the most vibrant global financial hubs and a strong pool of experienced executive education faculty members provide the required condition for a development programme that integrates academic rigour and industry relevance.
## Requirement of the enterprise digital talent

<table>
<thead>
<tr>
<th></th>
<th>Requirement</th>
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<tbody>
<tr>
<td>1</td>
<td>Ability to lead the cross-departmental teams on digital transformation projects</td>
</tr>
<tr>
<td>2</td>
<td>The ability to enhance the customer-centred products and service innovation, in order to create new profit points</td>
</tr>
<tr>
<td>3</td>
<td>The ability to enhance the capabilities of the business and efficiency of the enterprise by using data mining</td>
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## Pain points of nurturing talents

<table>
<thead>
<tr>
<th></th>
<th>Pain points</th>
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<tbody>
<tr>
<td>1</td>
<td>Lack of leaders leading the team on digital transformation projects</td>
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<tr>
<td>2</td>
<td>Difficulties of products/services innovation to meet the changing needs of customers, due to the shortage of all-rounded data talents at all levels</td>
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<tr>
<td>3</td>
<td>The key data analyst have insufficient knowledge of data analytics theory and data mining</td>
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## Training objectives

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<tr>
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<th>Objective</th>
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<tr>
<td>1</td>
<td>Train up the participants' digitalisation thinking, empower the participants to lead the team to implement the digital transformation strategy, advocate the participants' intention and ability to communicate and collaborate across departments and levels for digital transformation projects</td>
</tr>
<tr>
<td>2</td>
<td>Enhance the comprehensive ability of participants, including logic, analysis, innovation, business ability, and promote product/service innovation</td>
</tr>
<tr>
<td>3</td>
<td>Enhance the operation efficiency of the company by developing participants' ability of data analysis and tools application to unlock the valuable data mining</td>
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PART II

COMMUNITY
A successful programme that delivers value must be contextualised, relevant, problem-based and action oriented. To achieve this, in-depth process and organisational analysis, understanding and alignment of stakeholders, and meticulous planning are essential.

HKU Business School followed an iterative 5D process in the design and development. The process of “Diagnose, Design, Develop, Deliver, Debrief” is collaborative and solution-focused in nature, and it involves a thorough and continued needs assessment.

**HKU Executive Education’s Approach**

- **Diagnose**: Dialogues with key stakeholders to understand the development needs.
- **Design**: A customised learning journey and development solution upon detailed process and organisational analysis to ensure relevance and on-target results.
- **Develop**: Detailed planning and development of interventions to ensure high quality, consistent, professionally executed experience.
- **Deliver**: Delivery of learning experience led by the programme management team to ensure integration and consistency.
- **Debrief**: Timely debriefing to capture learning for continuous improvement of the development experience.
COLLABORATIVE PROGRAMME DEVELOPMENT AND MANAGEMENT MODEL

To develop a high impact learning solution and deliver the flawless development experience, HKU Business School adopted the Collaborative Programme Development and Management Model to plan, coordinate, control and monitor the entire project, from the start to the end.

The key involvement from CCB and HKU Business School is summarised below:

**CCB**
- CCB Stakeholders
- Data Management Department / CCB Learning Center
- Programme Manager, CCB
- Internal Speakers

**HKU Business School**
- Programme Director
- Programme Director, Project Director
- Programme Manager
- Faculty Members/Speakers, Programme Manager

**Areas of Collaboration**
- Programme Development
  - Conduct organisational and process analysis
  - Conduct stakeholder analysis
  - Align expectations
- Steering Committee
  - Develop programme framework
  - Coordinate and integrate of faculty members
  - Align internal speakers and faculty members/speakers
  - Ensure alignment with objectives
  - Oversee the development and progress
- Project Management
  - Plan and implement efficient project management
  - Conduct programme evaluation and reporting
- Content Development and Delivery
  - Development of case studies, materials, content and online tools
  - Programme delivery
  - Programme logistics and operation assistance
  - Administrative and logistic support
COLLABORATIVE EFFORTS IN ACTION

Professor Haipeng Shen, Patrick S Poon Professor in Analytics and Innovation, was appointed as the Programme Director to lead the design of the Programme. Professor Shen is the Associate Dean of Executive Education, and has extensive experience in management training and development as well as consulting.

Together with the leaders of CCB Data Management Department and CCB Learning Center, HKU Business Schools outlined the approach and design philosophy for the programme.

DEMAND RESPONSE AND DESIGN PHILOSOPHY

Leverage on the advanced research network
Make use of the unique advantages of the University of Hong Kong, leveraging on the business school’s top professors and industry network, inviting senior industry experts such as industry leaders to participate in teaching and mentoring, sharing their valuable experience and best practices.

Result-oriented
The training should be result-oriented, with the purpose of helping CCB improve its core competencies and solve practical problems in development.

Action learning
Interactive teaching, promoting peer-to-peer knowledge exchanges, and conducting simulation exercises.

Localized application
Emphasize the local application of knowledge in Asian business environment, keeping abreast of the latest development trends as well as using situational cases from the HKU Asia Case Research Centre for interactive teaching.

Tailored learning journey
Focus on customized learning journeys that combine real-life business issues with innovative cutting-edge teaching tools to create a unique immersive learning experience.
The preliminary design of the programme was also completed based on the following principles.

To understand the business well and acquire working knowledge of finance

To have thorough recognition and comprehension of data technology

Leadership, i.e. the ability to lead a team or organisation

Program content needs to be clear in design and framework

Such framework is coherent in theories and methodologies

Providing participants ample opportunities to practice

So far there is no lack of specialists in any of the three characteristics, but few talents can really master all of them.

Beyond acquiring a knowledge base, they can actually handle the projects upon completion of the training.

To ensure the content is relevant for participants, HKU Business School conducted two rounds of interviews with a group of data leaders, mid-level management from functions, and potential participants for the programme. Another round of anonymous survey was polled to further understand the desirable learning objectives from the participants, based on which the curriculum was refined.
The final design and syllabus were furthered reviewed by the two external reviewers

- Prof. Sirong Luo, School of Statistics and Management, Shanghai University of Finance and Economics
- Dr. Sijian Wang, Associate Professor from Department of Statistics, Institute for Quantitative Biomedicine, Rutgers University

Comments and recommendations made by both external reviewers were taken into consideration and the final programme design was endorsed by senior management of CCB.
SETTING OF LEARNING OUTCOMES

- To understand the most cutting-edge data analysis theories and develop practical ability of data analysis;
- Be able to carry out data projects, project results can be implemented;
- To develop teamwork skills to support cross-departmental data projects.
PART III

L&D INITIATIVE
PROGRAMME DESIGN

The Data Analytics Programme aims at the high-potential talents engaged in data analytics related work – the backbone of CCB’s efforts in digital transformation. The programme are designed in consideration of their different backgrounds, and the content of the programme are constantly adjusted throughout the discussion between the two parties.

CCB selected 112 participants with different levels and from different departments in various regions. The two parties plan to gradually increase the number of students after the first cohort of the Programme. The second cohort will be launched this year. We plan to recruit more participants in the second cohort.

The programme framework is designed based on the Master of Science in Business Analytics Programme of HKU Business School. We ensured that the content is comprehensive and coherent in theories, and the teaching methods of case studies, interactive discussions are widely used. We also ensured that the knowledge learned are practical and meet the needs of CCB.

In order to cope with the challenges brought by the Covid-19, the Programme is delivered in online and offline hybrid modes. Online courses are taught in forms of live broadcasts, combined with recorded lessons. The duration of each core and elective course is 12 hours. The entire programme was completed 14 months.
The first stage of the Programme includes Business Data Analytics Bootcamp (R, Python, Statistics, Maths), Federated Learning and Privacy Computing. The bootcamp covers mathematical knowledge, programming skills, database skills and statistical knowledge that related to business analysis. Trainees with less experiences can build basic competencies in bootcamp, while others can use the opportunity to improve relevant skills.
The second stage (core compulsory courses) includes Business Statistics, Data Visualisation, Quantitative Analysis Methods, Operations Analytics, Business Analytics Capstone. Core courses are the key for data analytics.

- **Business Statistics**
  Identification of problems of the business
  Selection and applications of effective solutions for the business
  Statistical softwares for solving the problems of the business and for communications

- **Data Visualisation**
  Visualising and reporting the data by using Tableau and Python
  Using Tableau to convert and clean the data
  Getting insight by visualisation

- **Quantitative Analysis Methods**
  Clear understanding and identifying the business problems
  Selection and usage of effective techniques to tackle the major challenges
  Problem solving by IT tools

- **Operations Analytics**
  Definition of operations processes
  Processes assessment analytics
  Techniques applications for improving processes
  Design and execution of effective operation system

- **Business Analytics Capstone**
  Integration and application of the knowledge and techniques that they have learned in previous modules
  Result presentation including identifying the problems, data mining, data analysis and applicable solutions
Stage 3 (Electives Courses) includes Managing and Mining Big Data, Marketing Analytics, Business Applications in Machine Learning, Forecasting and Predictive Analytics, Financial Engineering.

Stage 4, offline courses, which includes Social Media Analytics, Geospatial and Business Analytics and Capstone Presentation.
CAPSTONE PROJECTS

Business Analytics Capstone Projects provide participants the opportunity to analyse data using the knowledge and skills learned in the programme. Students can use real data to do modelling and participate in different stages of business analysis, including project planning and management, strategic positioning, modelling, data analysis, interpretation, and reporting. The capstone project provides students the opportunity to apply what they had learned to solve real-world data problems and hence gain first-hand experiences.

We assigned participants into groups, and each appointed an instructor, who would regularly provide guidance and host Q&A sessions. In rest of the time, each team arranged meetings on their own. The capstone project lasts for a period of 6 months. Participants presented the capstone results to instructors as well as CCB data segment leaders on graduation ceremony. The capstone topics were selected in accordance with actual problems encountered by the bank: such as customer’s asset trend prediction in retail banks; customer portrait; targeted promotion of regular products; financial risk control: loan default prediction, etc.

### CAPSTONE PROJECT TIMELINE

<table>
<thead>
<tr>
<th>Meeting</th>
<th>Analysis</th>
<th>Capstone Analysis</th>
<th>Interim Report</th>
<th>Finalisation</th>
<th>Final Report</th>
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</thead>
<tbody>
<tr>
<td>Preparation:</td>
<td>Starting:</td>
<td>Investigation:</td>
<td>Topics involved:</td>
<td>Outcome:</td>
<td>Topics involved:</td>
</tr>
<tr>
<td>- Objective of</td>
<td>- Topic Analysis</td>
<td>- Topic Analysis</td>
<td>- Understanding</td>
<td>- Suggestion and</td>
<td>- Understanding of the topics</td>
</tr>
<tr>
<td>capstone project</td>
<td>- Data Collection</td>
<td>- Data Cleaning</td>
<td>of the topics</td>
<td>solution</td>
<td>- Understanding of the data</td>
</tr>
<tr>
<td>identification</td>
<td>, cleaning, sharing</td>
<td></td>
<td>- Understanding</td>
<td>- Ready to report</td>
<td>- The process of data collecting</td>
</tr>
<tr>
<td>- Understanding</td>
<td></td>
<td></td>
<td>of the data</td>
<td>- Rehearsal</td>
<td>and cleaning</td>
</tr>
<tr>
<td>of the topics</td>
<td></td>
<td></td>
<td>- The process</td>
<td></td>
<td>- Analyse the result</td>
</tr>
<tr>
<td></td>
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<td></td>
<td>of data collecting</td>
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<td>- Forecasting</td>
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<td></td>
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<td>and cleaning</td>
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</tr>
<tr>
<td>May</td>
<td>June</td>
<td>July</td>
<td>August</td>
<td>September</td>
<td>October</td>
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**CAPSTONE PROJECT PROCEDURE**

1. **Form the teams with team leaders**
2. **Get the data from their working department and analyse the data**
3. **Meet with the team members regularly for the progress**
4. **Present the interim report, and prepare Powerpoint**
5. **Leaders lead their team to meet with mentor for project flow and timeline**
6. **Work in cooperation for all tasks, and work for the items and analysis individually**
7. **Meet and consult with mentor for the progress (3-4 times, 40 mins each)**
8. **Meet with mentor for final rehearsal**
9. **Complete and submit. 30 minutes Final presentation**
There were 3 sessions of industry sharing (online). We invited experts from top companies around the world to share experiences related to digital transformation, blockchain, AI and data analytics.

A participant can be granted with certificate, if he/she:
- Passes all the exams;
- Participates in and completes the capstone module; and
- Attends 80% of the online and offline classes.
HIGH IMPACT LEARNING EXPERIENCE

RIGOROUS CURRICULUM

The highly rigorous curriculum imparts a strong business acumen through the teaching of business and the tools to solve real life business challenges using big data. The programme equips participants with not only skills in strategic thinking and business communication to understand and articulate business problems, but also proficiency in using a variety of statistical, operation research and machine learning techniques needed to solve them.

RELEVANCE TO WORKPLACE

The programme places a premium on the immediate relevance to the participants’ work by giving them the means to apply at workplace. During the 14 months period of study, CCB initiated a number of strategies to improve transfer of learning to the workplace. Together with HKU Business School, participants were provided Just-In-Time (JIT) learning aids and mentorship to facilitate application. The output of the Capstone Project at the end of the learning journey, in addition, were further studied and optimised for implementation within the Bank and/or its branches.
TECHNOLOGY-ENHANCED AND PARTICIPANT-CENTRED TEACHING

Learning is effective only when participants are curious, inspired and invested in the learning. Keeping participants engaged in a year-long programme is therefore critical. In addition, challenges imposed by COVID-19 means that HKU Business School and CCB must make full use of technology, platforms, systems, and digital content to extend and enhance participant-centred learning.

The proprietary CCB Learning platform, armed with pedagogy and learning design by HKU Business School, enables seamless live virtual sessions, recordings and on-demand content, collaborative and social learning. Platform’s tracking mechanism and analytics offers real-time insights and allows teaching faculty members and programme coordinators to determine the best approaches for human intervention. Feedback and suggestions generated by participants were also collected via the platform so that the programme team could implement appropriate improvement for future modules.
The engagement is evident in the high completion rate. With a passing rate of 85.7%, a total of 96 participants completed all learning modules and fulfilled assessment criteria. Amongst the participants who successfully completed the programme, 86 participants further completed the assessment and received the Professional Certificate accredited by the Hong Kong Council for Accreditation and Vocational Qualifications (HKCAAVQ). The passing rate was as high as 76.8%.
IN VolvEmEnt OF bAnK’S SeNior LeAdErS

Critical to the ability of the programme to inspire role modeling and motivate learning is the involvement of senior leaders from the Bank. Senior leaders from the relevant units of the Bank such as the Data Management Department and CCB Learning Center were involved in the process of programme development and delivery.

Besides providing guidance on the Bank’s policies and framework, guidelines on values in the development phase of the programme, Bank’s leaders were invited in the facilitation of the learning – through a combination of talks and fireside chat to articulate the aspirations and expectations of the Bank and how trainees could contribute and succeed within the framework. Senior leaders also took part as judges and observers of the progress report and project presentations by participants.
PART IV

IMPACT
Successful companies are those that have found ways to identify and develop the skills and talent they need to respond to challenges and business imperatives. Through the partnership with HKU Business School, CCB succeeded in developing accelerated talent development experiences to support the business and stimulate a digital culture across the entire Bank. The learning journey and success created impact not only within the Bank itself but also to the banking industry in Hong Kong and Mainland China.

**IMPACT ON THE BANKING INDUSTRY IN DIGITAL TALENT DEVELOPMENT**

1. The programme sets a benchmark for the development of digital talents in the banking industry.

2. The accreditation by the Hong Kong Council for Accreditation and Vocational Qualifications (HKCAAVQ)’s Qualification Framework not only fills the gap of the professional certification of data analytics for the banking industry in the region, but also marked as the first step building an internationally recognised certification outside the Mainland China.

3. The programme attracted wide media coverage from domestic and overseas media, including Xinhuanet, Financial Times, Phoenix New Media, Hong Kong Economic Daily, Hong Kong Sing Tao Daily and other media.

4. Upon the success of the inaugural cohort, the programme is under review for endorsement by the Hong Kong Monetary Authority (HKMA) under its Enhanced Competency Framework (ECF) for Banking Practitioners.
IMPACT ON DEEPENING RELATIONSHIP AND SCOPE OF COLLABORATION

1. The success of the programme accelerates further collaboration between CCB and HKU Business School.

2. Building on the programme, CCB is rolling out a series of thematic training programmes for all its subsidiaries to meet the demand of digital talent development across the Bank. And HKU Business School is actively working with CCB to further develop micro-learning content to bring learning opportunities to more employees within the Bank.

IMPACT ON BUSINESS ACROSS THE BANK, FUNCTIONS AND BRANCHES

Major Projects

Since the commencement of the Programme, 58.7% of the surveyed participants have participated in major digital projects within CCB such as Digital Infrastructure Project, Anti-Gambling and Fraud projects, and Smart Risk Control projects.

Impact on Business across the Bank, Functions and Branches

Appointment in Key Positions of Business Analytics

- One of the participants were appointed as the data analyst in a provincial branch, which is the only hire with professionals skills at level 6.

- One of the participants were promoted from the Head of Department to Deputy Branch General Manager.
KIRKPATRICK MODEL

As a part of the efforts to evaluate the programme performance and impact, HKU Business School and CCB agreed to adopt the Kirkpatrick Model.

KIRKPATRICK MODEL

Results

04 Did the training influence performance?

Impact

03 Did the training change behaviour?

Learning

02 Did learning transfer occur?

Reaction

01 Did the learners enjoy the training?
LEVEL 1: REACTION

In terms of learner’s reaction to all courses and learning components, more than 75% of the entire cohort reported the highest rating and close to 100% responded very positively to the instructor, course design and quality of delivery.

The aggregated ratings in detail are as follows:
LEVEL 2: LEARNING

Measure of how much participants learnt from the programme and improved their skills was very positive. A total of 95% of the participants reported that the programme was successful in shaping and improving the digital way of thinking, knowledge of subject matter, ability to apply and transfer learning, skills in team collaboration, confidence, and clarity in further career development.

The aggregated ratings in detail are as follows:

![Figure 2](image_url)
LEVEL 3: BEHAVIOUR

Measure of how participants applied what they learnt from the training reveals that the participants participated in a variety of cross-function and cross-business digital projects after the programme. In addition, participants tried to pass on the learning to fellow colleagues in the form of sharing sessions and inhouse training. This is a testimony of the fact that the programme empowered the participants in leading teams to implement digital management and cultivating the digital culture.

Selected qualitative feedback is appended below:

SELECTED QUALITATIVE TESTIMONIAL

Cross-functional Collaboration
I took part in the Data Support Group of the Digital Operation Command Team, which is a cross-functional task force. In this task force, I was responsible for identifying and solving operational issues with data at the provincial branch in collaboration across functions.

Internal Learning Sharing
I organised colleagues at the branch office to go through the training content available on the CCB Learning platform, and arranged assessment at the end of each module to evaluate knowledge acquisition."

I published the Capstone project I completed during the programme on the ‘Github’ internal to the bank and invited all employees to exchange views and learning.

Pilot Implementation
I organised team members to make use of the model built in the programme, and we completed seven projects.

I initiated pilot collaboration with external data providers on federated learning and privacy computing.
LEVEL 4: RESULTS

Follow-up surveys conducted 3 months after the programme revealed that 60.2% participants took on the challenges at the workplace and achieved tangible impact to the business. As highlighted below, participants appeared to really connect with the learning experience.

Selected projects that create tangible impact to the Bank’s business are appended below:

1 // Customer Insights

Using Decision Tree Algorithm, a group of participants were able to conduct customer profiling, credit card fee collection, marketing, and behaviour analysis and completed a report on Customer Churn Prediction for Supplementary Credit Card Holders.

2 // Customer Management

A group of participants conducted life cycle assessment on the Bank’s customers of payroll payment using data of used product, asset and consumption patterns. The insights developed from the analysis were used to develop appropriate strategies to accelerate the growth and maturity of clients, and to delay and manage the decline.
3 // Precision Marketing

Using Machine Learning and knowledge gained in the programme, a group of participants managed to identify customers who are relatively more responsive to marketing campaigns and followed up with targeted promotional activities. The success rate of the campaign was measured at 12%, which was much higher than the previous success rate of 3% - 5%.

4 // Data Driven Application

Using the ARIMA (Autoregressive Integrated Moving Average) Model for analysing and forecasting time series data, a group of participants were able to identify patterns of payment and analyse a variety of applications in payment. The analysis was used to support the planning of digital operation.

5 // Product Development

A group of participants used data analysis to develop exclusive credit products that are suitable for small and micro technology business ventures.

6 // Decision Making Support

- Using indicators such as local market share, settlement volume and savings retention rate, a group of participants conducted analysis to assess factors impacting the indicators and used the analysis output to inform the business decision making.
- Using the knowledge and skills learnt in data visualisation, participants developed a map of the clients of acquiring services detailing the location, amount, frequency and other important metrics. The map provides important insights to client/territory managers to expand services and increase business volume.
7 // Opportunity Identification

The Non-Map Smart Localisation algorithm developed by a group of participants for the CCB branch was successfully deployed in another provincial branch and the local Industrial and Commercial Bureau. This enabled the branch to locate new business registrations and generate new business opportunities daily.

8 // Recognition of Project Application

Some projects completed by participants won awards domestically in China. Highlights of the projects include:

- Long-tail customer profiling project
- Mining of inclusive business and risk prediction model
- Rent Seeker project
PART V

REFLECTION
The Data Analytics Programme provides the best example of collaboration between higher education institutions and enterprises:

- Impact-oriented and customized solutions specifically targeting enterprise digitalization of CCB;
- Keep abreast of latest development in technologies and methodologies in data analytics, bridging theory and practice;
- The programme successfully achieved its objectives and had a far-reaching impact on data talents development - for both CCB and the banking sectors.
EXECUTIVE EDUCATION

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