AB-IoT
Artificial-intelligence and Block Chain to Facilitate Food Safety

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Webinar on Digital Innovations for Transforming Food Safety Outcomes in China
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PART 01
Ping An Advantages of “Integrated finance + technology leading”
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- **Ping An Bank**

- China’s **first** publicly listed national joint-stock bank
- Headquartered in **Shenzhen**, the network covers **the whole country**
- By the end of 2020, the total assets were **4,468.5 billion yuan**, the net profit was **28.9 billion yuan**, and there were **100** branches and **1,057** business institutions

- **No. 21** in Global 500 by The Fortune and **No. 7** in Global 2000 by The Forbes
- **No. 1** in market value among global insurance groups and **No. 1** in global insurance brand
- International leading **technology-based** personal financing life service group
- By the end of 2020, the total assets were **9,527.9 billion yuan**, the net profit was **143.1 billion yuan**, the number of individual customers was **218 million**, and the number of Internet users was **598 million**
Under the guidance of the "technology-led" strategy, Ping An continues to deepen the "finance + technology" and "finance + ecology" strategy, attaches great importance to core technology research and independent intellectual property management, constantly increases scientific and technological investment, and uses AI, OCR, voice print recognition, block chain and other leading technologies to enable financing business.

<table>
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<th>Category</th>
<th>Description</th>
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<tr>
<td>Number of fintech patent applications in 2020</td>
<td>Ranked No. 1</td>
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<td>Number of digital medical technology patent</td>
<td>Ranked No. 2</td>
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<td>Number of PCT international patent applications</td>
<td>Ranked No. 8 in the world</td>
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**Ping An Advantages of “Integrated financing + Technology leading”**
Ping An Advantages of “Integrated finance + Technology leading”

### Three chains structure
- Industry chain
  - Check trade background
  - Insight into customer operations
  - Aggregation of industry ecology
- Digital dual chain
- Block chain

### Open bank
- Output bank finance+non-finance ability
- Develop enterprise’s industry digitalization process
- Provide complete, efficient, safe and compliant digital finance services

**5大行业**
**20+项目**
**238W+设备接入**

**4700+ API interface output**
**Over 20,000 customers**

### AI model
- **Quantified model** supports digital assessment, marketing caring and alarming forecast
- **Intelligent identification** supports remote operation, contactless service, optimized process and improved experience
- AI middle platform builds algorithm base and rule base, and establishes service registration and management mechanism

### Block chain
- Self developing, leading tech., with 3rd party authority verification as Leading company of block chain tech. innovation in China.
- Develop own sectoral standard based on PBOC’s standards
- Practical experience with over 10 block chain cases implemented to the ground

### Channel
- Digital pocket, Ping An Chain, Financial Asset Mag, Bank-company link

### Application
- ID unified digit account, Open API

### Service
- Unified interface, LUM product, AUM product, Disbursement settling, Financial SaaS service, Industry SaaS service
Ping An Bank has made satellite Launch and space-based IOT constellation development exploration. From cooperative exploration to independent operation, the autonomous and controllable IOT satellite network is gradually realized, and the "Ping An Constellation Alliance" is established to provide customers with satellite network communication operation services and financial services under the IOT scenario.

Launch Ping An #1

The first in the country
The satellite is the first satellite launched by a financial enterprise in China.

The industry benchmark
Create a new benchmark of "finance + technology" and "finance enabling industry", and explore the solution of "hardware + data + finance"

Ping An Bank space-based IOT project, is an important breakthrough in financial + technology + ecology
Connecting data and physical assets through the IOT, enables closed loop monitoring
Explore and create a digital economy service ecology with satellite constellations above, IoT devices on the ground, digital pockets and open banks in the middle.

Build a **satellite** constellation for the global Internet of Things.

Access to ground **megaflop** IoT devices.

Serve **tens of millions of** Internet B-end customers.

Support **trillion-level** supply chain and digital financial assets.
Improve new supply chain financial services by relying on technologies such as the Internet of Things, blockchain and big data

- Focusing on customers in key industries, in-depth industry chain panorama, through the Internet of Things technology to realize the digitization and circulation of assets, mining scenario financial demand
- Through online, modularization and automation, breaking through the dependence of traditional business on core enterprises and realizes the deeper expansion of supply chain
- To create a new type of supply chain financial services with light business model, standardized operation, high intensity and strong scientific and technological attributes.
Achieving the comprehensive integration of modern ICT technology with six major technological advantages

- Integrating Internet of Things technology, blockchain, AI, edge computing and other technologies, it can realize the perception, identification, positioning, tracking, monitoring and management of physical assets, integrating right confirmation, source traceability, truth verification and corroboration.
Help to upgrade traditional financial concepts, and three-chain isomorphism enabling industry upgrade

- Fusion of IoT industry chain + block chain + digital twin (IoT chain) three chains isomorphism, to help establish a credible digital link between banks and enterprises.
- Enabling financial institutions to assess customer qualifications, identify business risks and business opportunities, and provide integrated services.

Beyond accounts receivable, advance payment financing
Go deep into the production and operation process of the industry itself
Certified assets can be valued and traded

- Verify trade background
- Insight into customer operations
- Aggregation industry ecology

- Bulk commodity pledge
- Car ecology
- Industry internet monitoring
- Smart fuel station
- Intelligent cultivation

Industry equipment
ERP/DMS
Data collectors
Data gateway
Stored goods
Transport tools
Husbandry and cultivation
……

- Edge computing
- Block chain
- Nebular platform
- AI
- Open API

Digitization of Financial Services
- Deposits
- Loan
- Disburse
- Financing
- Credit
-……

Digitization of production and operation
- Production
- Procurement
- Sales
- Operation
- Warehousing
-……

Evaluate customer qualifications
Identify business risks
Identify Business Opportunities

Three streams in one
Rights circulation
Rating scoring
Early warning and forecast

Nebular platform
Edge computing
AI
Open API
Block chain
Data collectors
Data gateway
Stored goods
Transport tools
Husbandry and cultivation
……
Connected with 2.3 million IOT devices in main industries for digital operating and interconnecting

- At present, Nebula has connected with over 2.3 million IOT devices ranges from manufacturing, automobile, agriculture, energy, and logistics, to empower industry development by providing comprehensive financial services and facilitate digital upgrade.
Relying on the Internet of Things and blockchain, helping to upgrade the digital smart agriculture
Internet of things + block chain, help biological assets traceability and anti-counterfeiting

Combined with blockchain technology, the whole pig industry chain can be deeply integrated, and the data information of all stages can be linked from feed production, pig breeding, pig breeding, epidemic prevention inspection, pig processing, cold chain logistics, sales, and consumer purchase, so as to truly achieve source traceability and anti-counterfeiting.

Consumers get the food safety information from feed production to cold chain logistics.

It can be traced back to every link.
Biometrics identification helps financing smart farming

Dairy asset monitoring system relies on block chain technology + big data technology, integrates UHF RFID technology, sensor technology and GPRS remote communication technology, and realizes accurate identification of individual cattle, automatic statistics of group number, automatic alarm of biological abnormality, video monitoring of breeding, and other functions.

- Production environment and facility environment perception
- Collect population information to control quantity, epidemic situation, etc
- Collection of individual animal information, establish production file database
- Restore business performance: business efficiency, market conditions, and industry factors
- Make the balance sheet and cash flow statement of the enterprise to judge the financial soundness
- Intelligent post-loan management, the automatic connection based on IoT information can monitor the real-time operation and ensure the real and reasonable use of the loan

Young Cattle Supplier

RFID/360 camera/smart camera/temperature sensor/humidity sensor

sales record

procurement data

Nebular platform

Accurate identification of individual cattle

Automatic statistics of group number

Automatic alarm of biological abnormality

Video monitoring of breeding

Farmers

Buyers

RFID tag

sensor

Biological monitoring

Milk Quality Monitoring

Feed Monitoring

Dairy asset monitoring system integrates UHF RFID technology, sensor technology and GPRS remote communication technology, achieving accurate identification of individual cattle, automatic statistics of group number, automatic alarm of biological abnormality, and video monitoring of breeding.
Internet of Things + Block Chain, to integrate with whole breeding industry

The application in breeding industry can include dairy cow and beef
Internet of Things + Block Chain, to integrate with whole crop farming industry

To facilitate full crop farming participants based on financial technologies

01
To provide digital crop farming services and deduct cost while increasing efficiency based on block chain technology

Farming equipment requirement collection

Corp farmer

Corp farming loan/Insurance

Manufacturer operating loan

Ping An

Floating loan for market end

Food product provision

Point of sale

02
Deduct purchasing cost for crop farmers by collecting massive equipment requirement

03
To provide financial services based on crop farming data

04
To supply secure food for market end
Vision: Finance + Technology, Finance+Ecosystem

Integrated Finance: Bank and insurance

Technology Leading: Block Chain, Internet of Things, Artificial-intelligence, Big Data

Successful Cases: Dairy cattle breeding, beef breeding, pork breeding and corp farming
Thank you

Innovation and Digitalization Driving Agrifood Value Chains
Based on the trusted network by, Ping An Bank builds a financial ecosystem
Based on the characteristics of blockchain, the digital financial ecology of blockchain is created.

- Positioning industry alliance chain, security financial application.
- The realized cases involve many fields such as finance, government, supply chain ecology, regulation, and fintech.
- Take HaoChain as an example. At present, there are a total of 10,000 blocks traded on the chain, involving about 60 billion yuan.

**Technical features**
- Reference standardization
- Technical neutralization
- Convenient integration
- Adaptive to scenarios
- Optimization and innovation based on matured tech of the sector
- Fast modeling of applications
Build block chain BaaS platform to support rapid application development

**Fast development of applications**

- It provides a series of advanced encapsulation services including: security, audit, identity management, block chain call encapsulation, alliance governance, block chain enhancement, plug-in management and so on, making application development more convenient.

**Wide application**

- Smart contract layer, using state machine to visually define business processes. JSON-SCHEMA and other model technologies are used to realize the normalization, self-description and self-verification of data structures, which reduces the cost of contract development.
- Business people can also participate in contract development. Qlang is used to satisfy the complex logic.
The main technical advantages of Ping An Bank blockchain

Secure and reliable - commercial level security and encryption protection
- Code retrofitting
- Transaction privacy protection
- Electronic safe box (password envelope) mode
- Zero-knowledge proof pattern
- Encryption of ledger and communication
- CA support multiple CA

Strong underlying technical capability - native framework optimization
- Native framework source code optimization
- Block acceleration technology
- Client packaging and optimization

18/5000 Rich consensus mechanisms - pluggable consensus patterns/algorithms
- Kafka consensus
- EtcRaft consensus
- Differentiated consensus: The consensus of alliance members is stratified

Good non-functional indicators of the system - horizontal scaling design
- The BaaS layer is developed based on the micro-service framework
- Improved health detection for native frameworks

Completely functional - complementary to the blockchain ecosystem
- Horizontal scaling
- Data storage reliability assurance
- Service fault tolerance
- Off chain storage technology of large file
- Electronic safe hardware encryption extension
- Business can be regulated, technology can be monitored
- Ecological visual management

High availability design
- The above technical indicators verified by a third party
- The industry standards compiled based on the above indicators have been recognized by authoritative guiding institutions. Won the title of "Leader" in the first batch of related fields