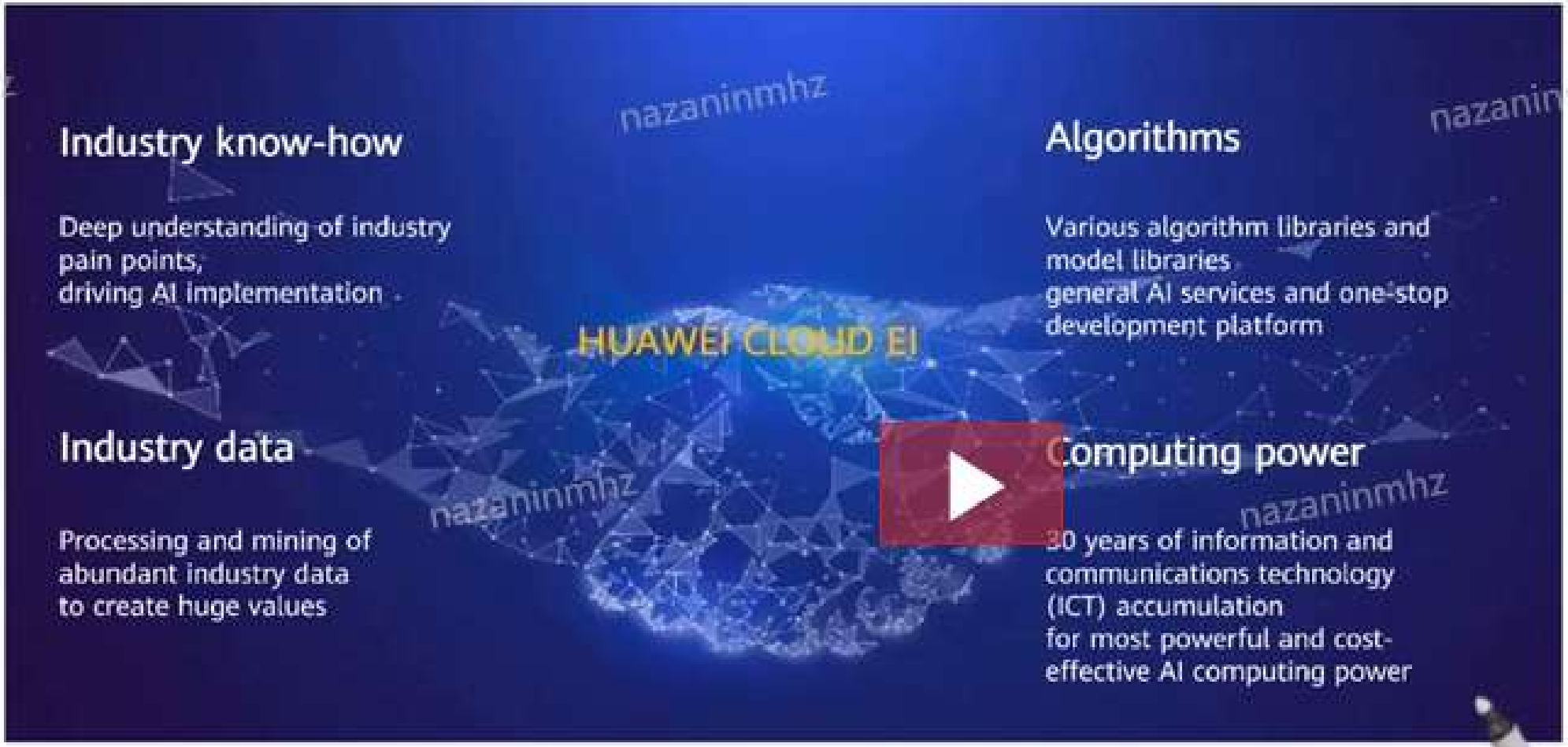
Objectives

On completion of this course, you will be able to:

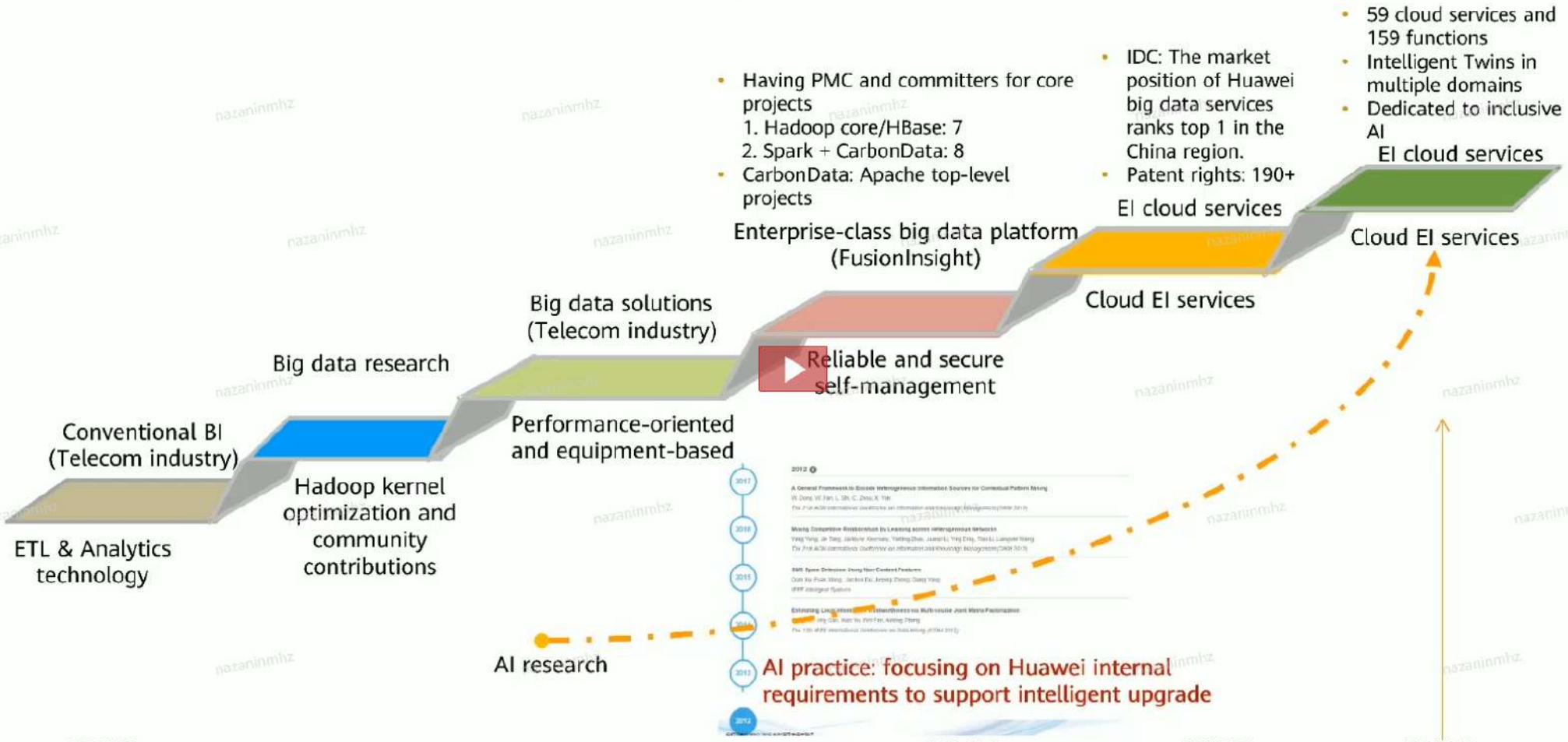
- Know the HUAWEI CLOUD enterprise intelligence (EI) ecosystem and services.
- Know the Huawei ModelArts platform and how to perform operations on the platform.

Contents

HUAWEI CLOUD EI



HUAWEI CLOUD EI Development History



such as OCR recognition path planning

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EI Intelligent Twins

- The EI Intelligent Twins integrates AI technologies into application scenarios of various industries and fully utilizes advantages of AI technologies to improve efficiency and experience.

Transportation
Traffic prediction and signal coordination for efficient traffic control

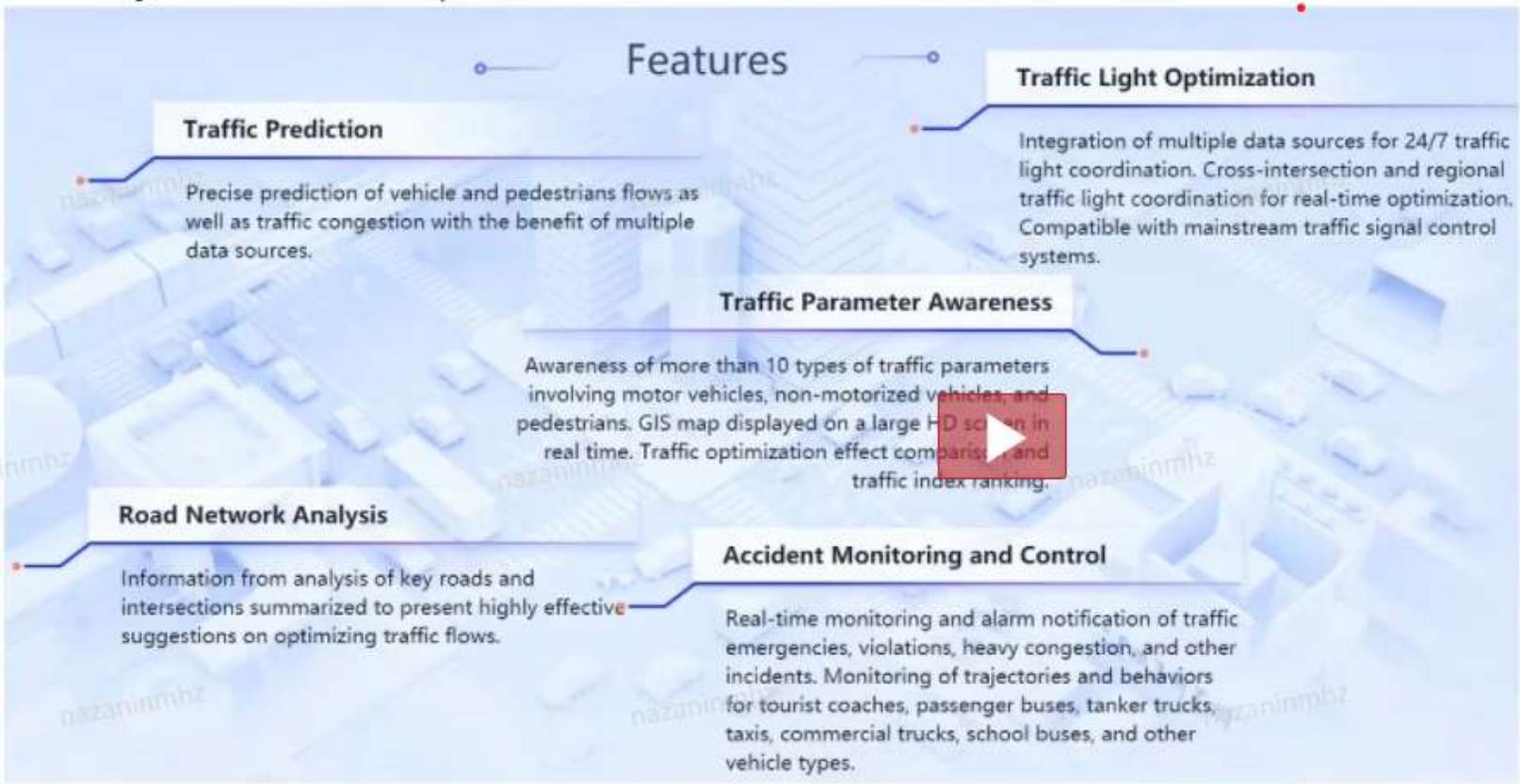
Industrial
Engineering intelligence for design, production, logistics, and sales

Campus
Applied intelligence for safety, convenience, and efficient energy

Vehicle
Intelligent navigation, supervision, and assistance for safe driving

Traffic Intelligent Twins (TrafficGo)

- The Traffic Intelligent Twins (TrafficGo) enables 24/7 and all-area traffic condition monitoring, traffic incident detection, real-time traffic signal scheduling, traffic situation large-screen display, and key vehicle management, delivering an efficient, environment-friendly, and safe travel experience.



Industrial Intelligent Twins

- The Industrial Intelligent Twins uses big data and AI technologies to provide a full series of services covering design, production, logistics, sales, and service. It helps enterprises gain a leading position.

EI Products and Services

ModelArts

ModelArts is a one-stop development platform that helps AI developers build models and manage the AI development lifecycle with data preprocessing, semi-automated data labeling, and distributed training.

Graph Engine Service

Graph Engine Service (GES) facilitates querying and analysis of graph-structure data based on various relationships. It is specifically suited for scenarios requiring analysis of rich relationship data.

Data Lake Insight

Data Lake Insight (DLI) is a Serverless big data compute and analysis service that is fully compatible with Apache Spark and Apache Flink ecosystems and supports batch streaming.

Video Ingestion Service

Video Ingestion Service (VIS) ingests massive volumes of video data in real time. Its superb data collection, real-time transmission, and video retention capabilities allow easy intelligent video analysis.

Data Warehouse Service

Data Warehouse Service (DWS) is a fast, easy-to-use, and reliable enterprise-class converged data warehouse service that can extend queries and analysis to your data lake with the help of DWS Express.

Cloud Stream Service

Cloud Stream Service (CS) is designed to process streaming data in real time. Computing clusters are fully managed by CS, allowing you to run StreamSQL or custom jobs without learning any programming skills.

MapReduce Service

MapReduce Service (MRS) provides enterprise-level big data clusters on the cloud. Tenants can fully control clusters and easily run big data components such as Hadoop, Spark, HBase, Kafka, and Storm.

Question Answering Bot

Question Answering Bot (QABot) helps enterprises quickly build, publish, and manage intelligent Q&A bots.

Image Recognition

Image Recognition uses deep learning technologies to accurately identify objects, scenes, and concepts in images using a pool of visual content tags.

EI Essential Platform

ModelArts

One-stop AI development platform

Huawei HiLens

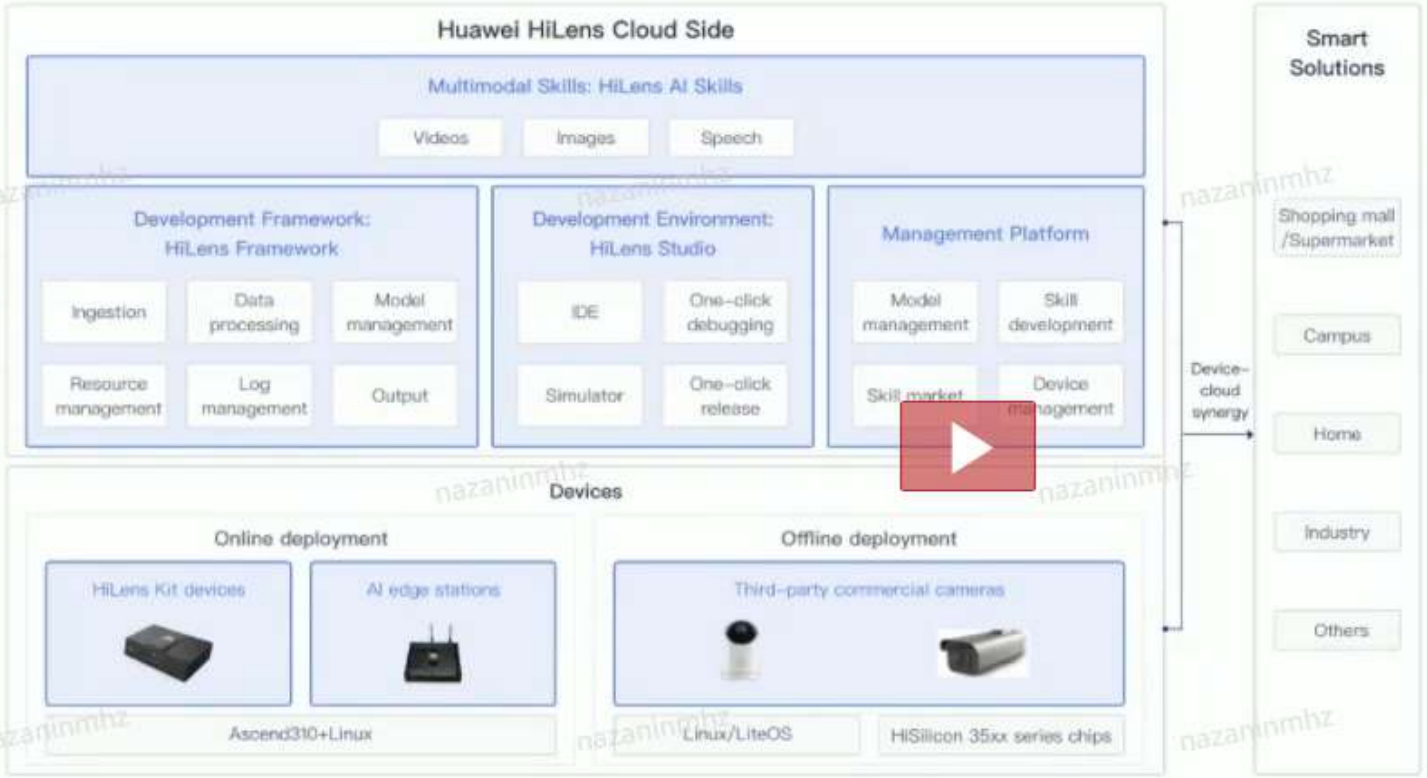
Multimodal AI development platform that enables device-cloud synergy

Graph Engine Service (GES)

First commercial self-built distributed native graph engine with independent intellectual property rights in China

Huawei HiLens

- Huawei HiLens consists of computing devices and a cloud-based development platform, and provides a development framework, a development environment, and a management platform to help users develop multimodal AI applications and deliver them to devices, to implement intelligent solutions in multiple scenarios.



GES

GES facilitates query and analysis of graph-structure data based on various relationships. It uses the high performance graph engine EYWA as its kernel, and is granted many independent intellectual property rights. GES plays an important role in scenarios such as social apps, enterprise relationship analysis applications, logistics distribution, shuttle bus route planning, enterprise knowledge graph, and risk control.

- Social relationships
- Transaction records
- Call records
- Information propagation
- Browsing records
- Traffic networks
- Communications networks
- ...

The massive and complex associated data is graph data in nature.

GES

- Diversified data independent of structures
- Data association and propagation capability
- Dynamic data changes and real-time interactive analysis without training
- Visualized and interpretable results

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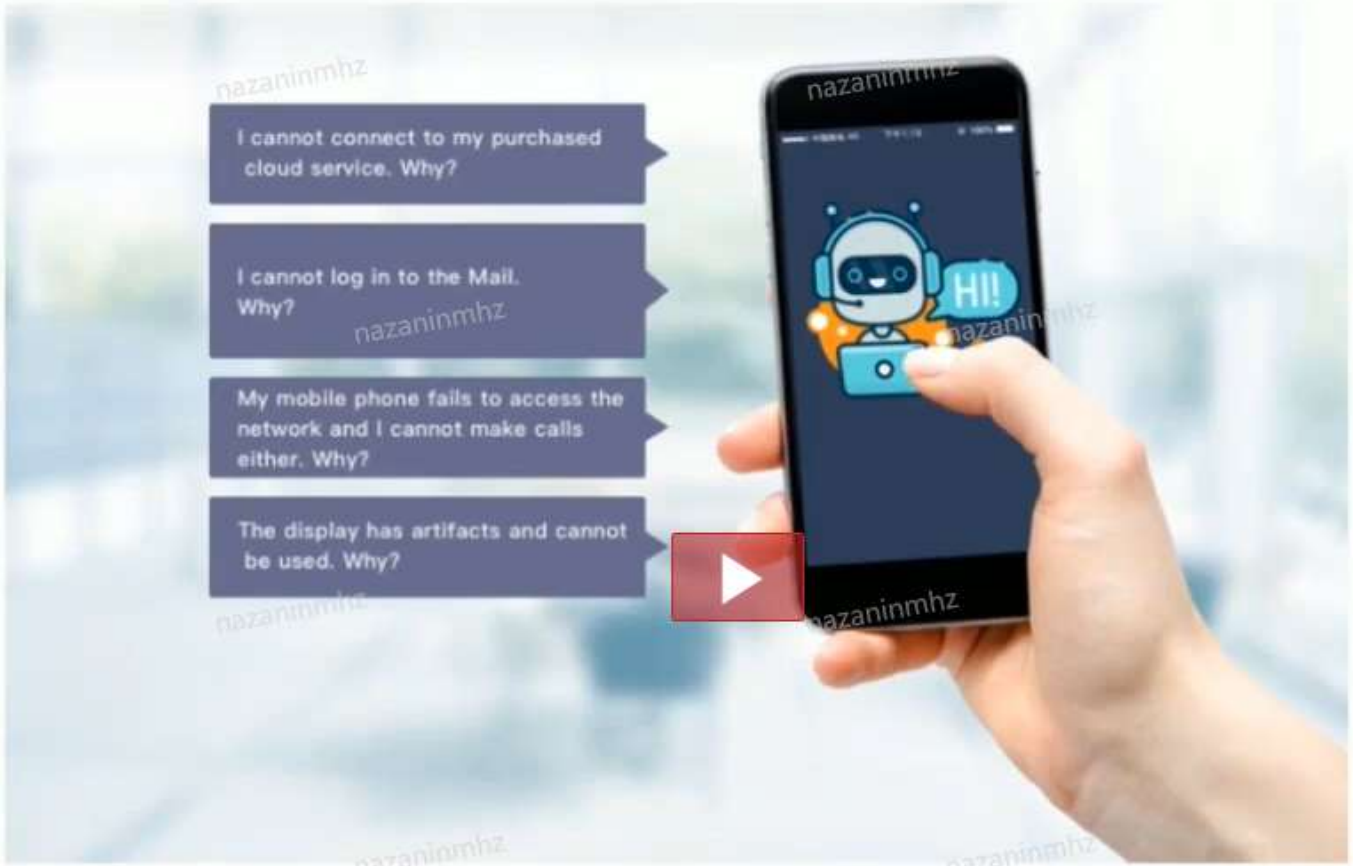
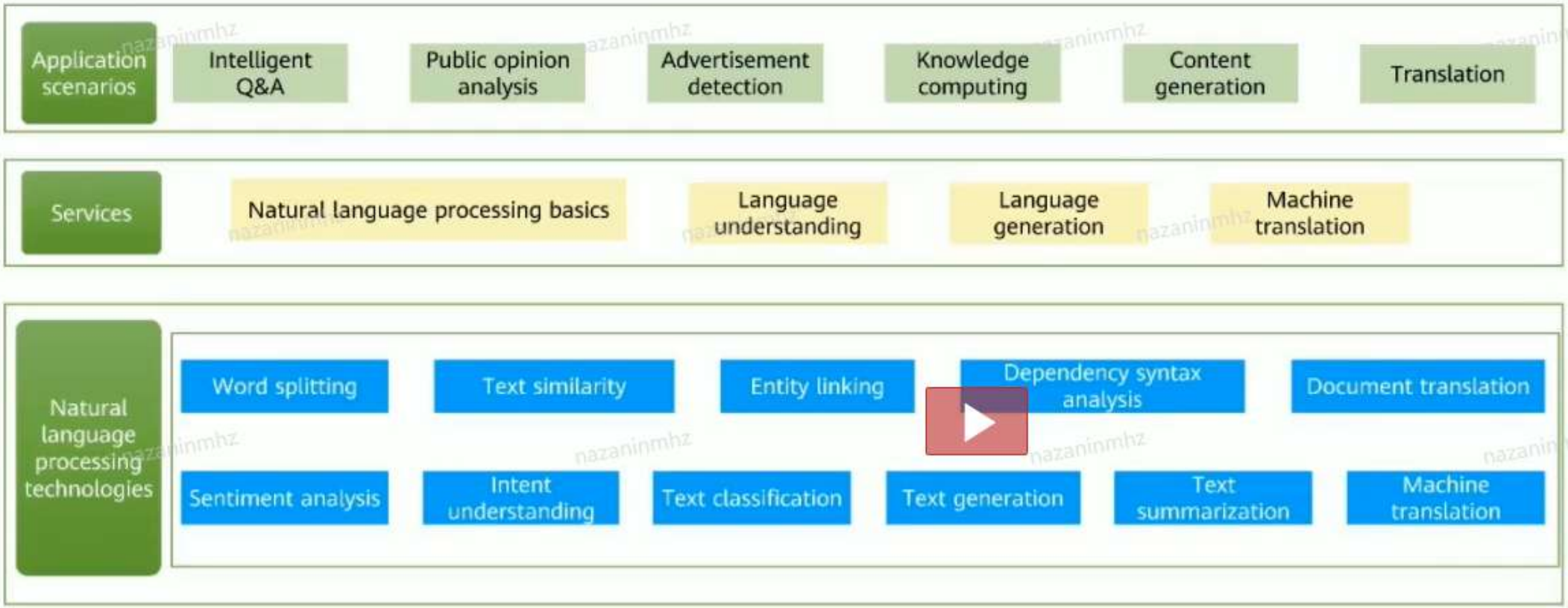
Conversational Bot Service (CBS)

- Question-Answering bot (QABot)
- Task-oriented conversational bot (TaskBot)
- Speech analytics (CBS-SA)
- CBS customization



Natural Language Processing



Voice Interaction

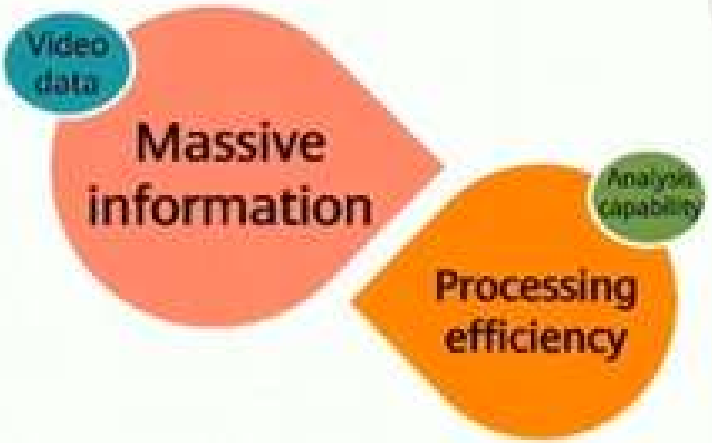
Short sentence/speech recognition

Real-time speech recognition

Audio recording recognition

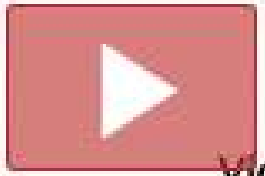
Audiobooks

Video Analytics



Video content analysis

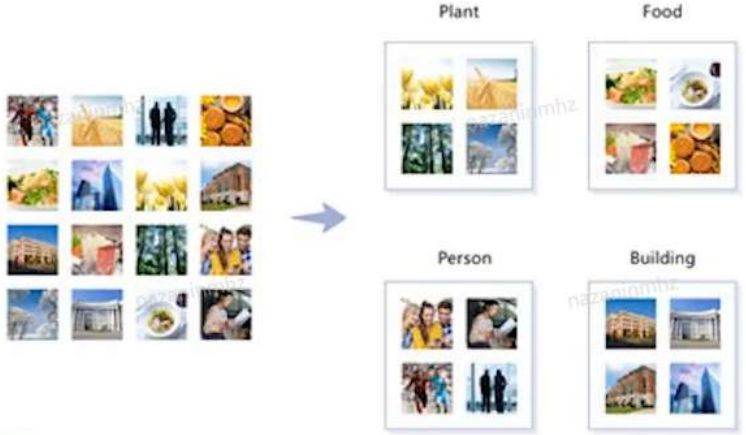
Provide the cover, splitting, and summarization capabilities based on the overall video analytics.



Video editing

Image Recognition

Scenario analysis



Smart album

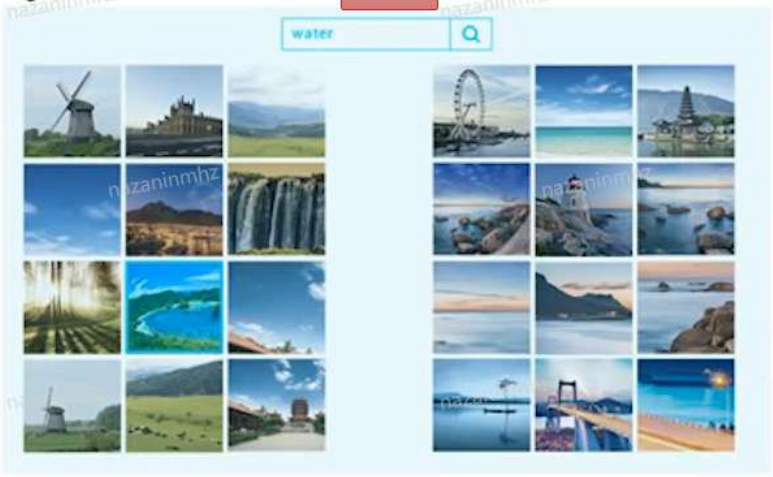
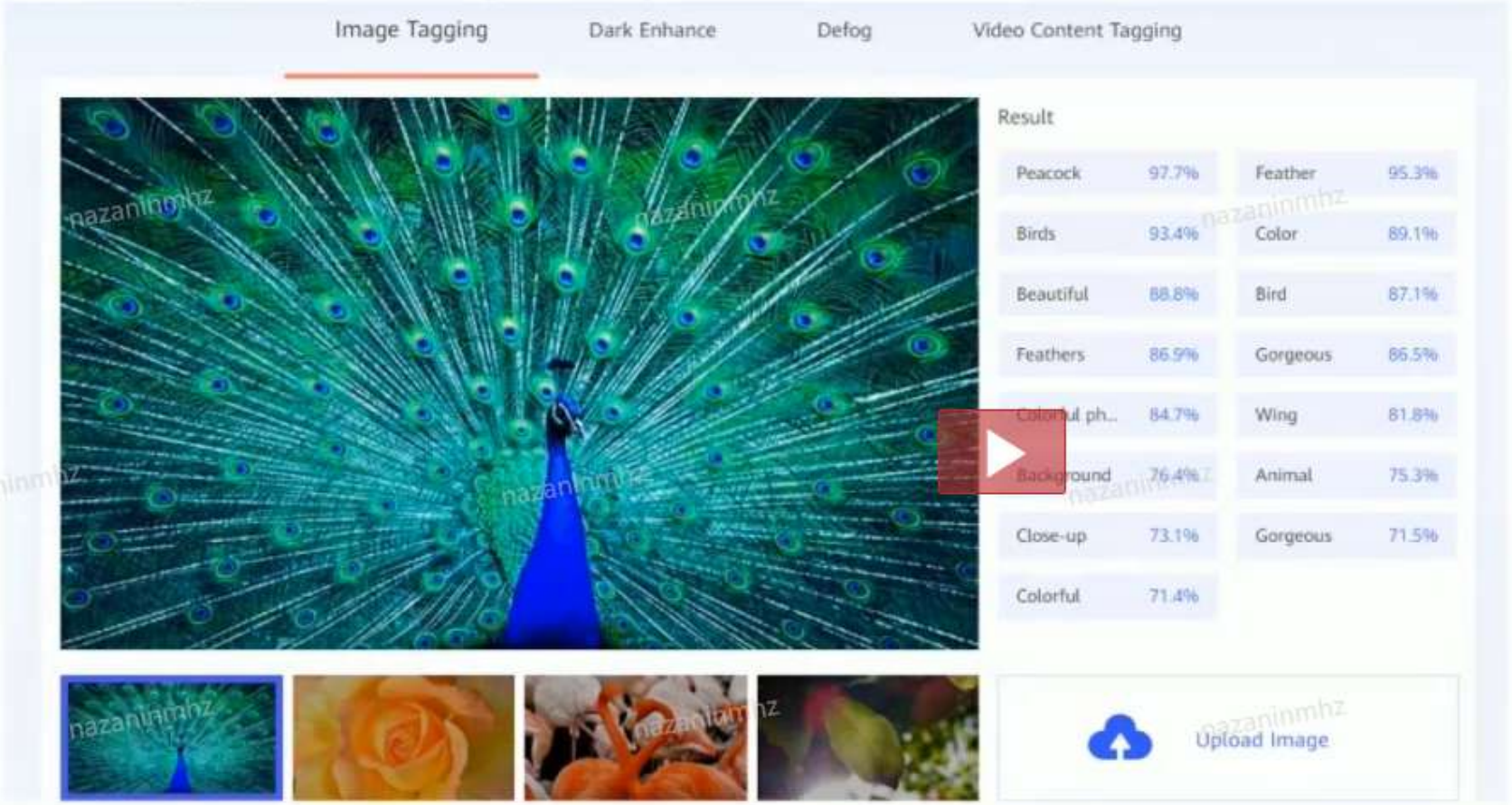


Image retrieval

Image recognition service means that given a picture

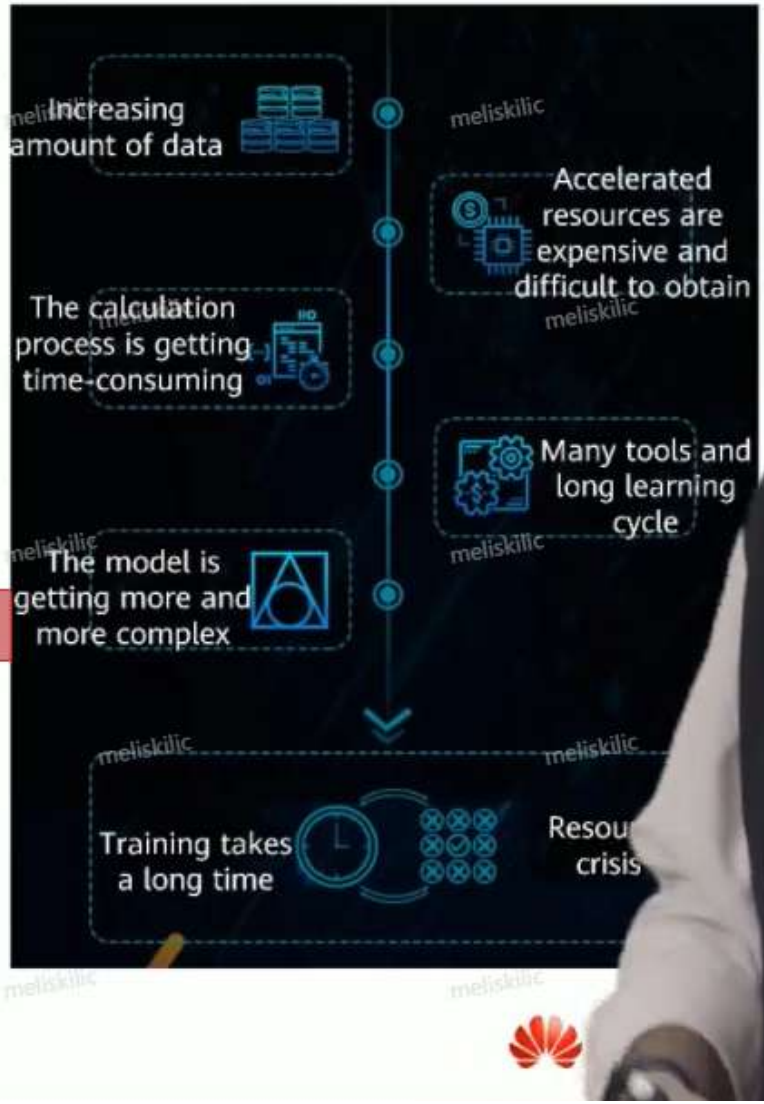
EI Experience Center

- The EI Experience Center is an AI experience window built by Huawei, dedicated to lowering the threshold for using AI and making AI ubiquitous.



ModelArts

- ModelArts is a one-stop development platform for AI developers. With data preprocessing, semi-automatic data labeling, large-scale distributed training, automatic modeling, and on-demand model deployment on devices, edges, and clouds, ModelArts helps AI developers build models quickly and manage the AI development lifecycle.



ModelArts Functions

Data Management

ModelArts manages data preparation, such as collection, filtering, and labeling, and dataset versions, especially for deep learning datasets.

Rapid and Simplified Model Training

Huawei's MoXing deep learning framework enables high-performance distributed training. To accelerate model development, it uses automatic hyperparameter tuning and standalone and distributed training.

Model Deployment

ModelArts deploys models in various production environments such as devices, the edge, and the cloud, and supports online and batch inference jobs.

ExeML

ModelArts supports code-free modeling and auto learning with image classification, object detection, and predictive analytics.

Visualized Workflow

ModelArts works with Graph Engine Service (GES) to manage and visualize the lifecycle of AI development workflows, implementing data and model lineage.

AI Marketplace

ModelArts supports common models and datasets, and internal or public sharing of enterprise models in the marketplace.

ModelArts Applications

AI development lifecycle

Data

Data preparation

- Three scenarios (image, speech, and text)
- Seven labeling scenes

Model building

- Out-of-the-box and online development
- Powerful computing and accelerated development

Model deployment

- High throughput and low latency
- Batch inference
- Combined with HiLens and easily deployed on devices

ModelArts Highlights

One-Stop Platform

The out-of-the-box and full-lifecycle AI development platform provides one-stop data processing, model development, training, management, and deployment.

Easy to Use

Various built-in open source models and automatic hyperparameter tuning help you start model training from scratch. Models can be deployed on the device, edge, and cloud with just one click.

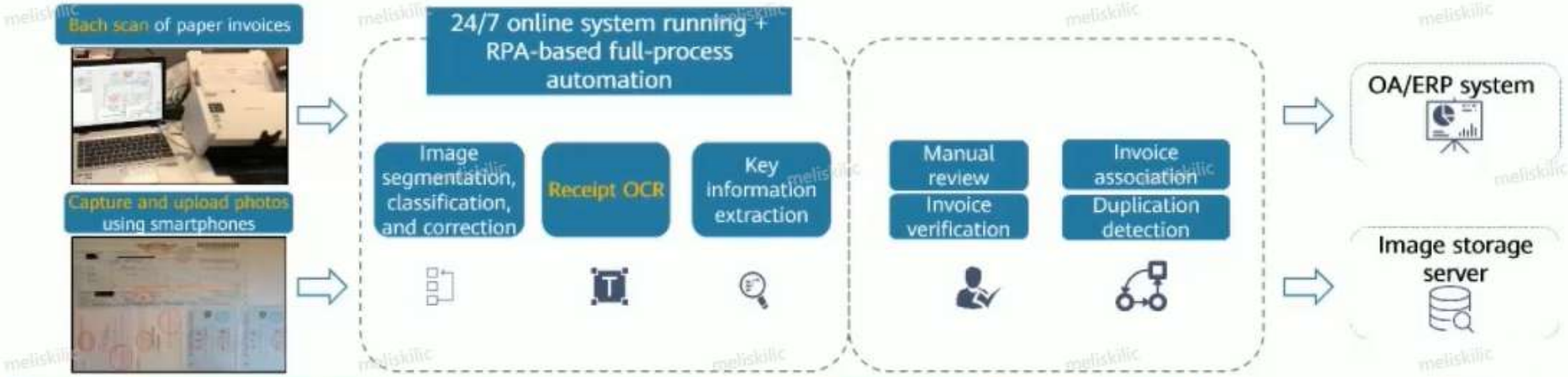
Excellent Performance

The Huawei-developed MoXing framework delivers high-performance algorithm development and training. GPU utilization is optimized for online inference. Huawei Ascend chips significantly accelerate inference.

High Flexibility

ModelArts supports multiple mainstream open source frameworks, such as TensorFlow and Apache Spark MLlib, mainstream GPUs, and the Huawei-developed Ascend AI chips. Exclusive use of resources and custom images ensure flexible development experience.

Case: OCR Implements Full-Process Automation for Reimbursement Through Invoices.

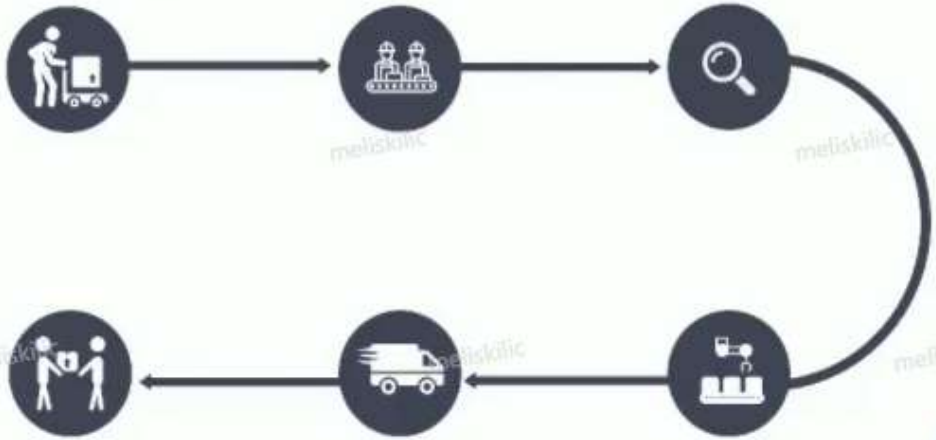


- **Multiple access modes**: automatic connection to scanners to obtain images in batches; image capture by using high-speed document scanners and mobile phones
- **Flexible deployment**: multiple deployment modes such as public cloud, HCS, and appliance, and unified standard APIs
- **Support for various invoices**: regular/special/electronic/ETC/roll value-added tax (VAT) invoices, and taxi/train/flight itinerary/quota/toll invoices
- **One image for multiple invoices**: automatic classification and identification of multiple types of invoices
- **Visualized comparison**: return of OCR character location information and conversion of such information into an Excel file for statistics collection and analysis

Case: Intelligent Logistics with OCR

➢ **ID card OCR**
- ID card photographing, recognition, and verification with mobile apps

➢ **Screenshot OCR**
- After an e-commerce platform receives a buyer's address and chat screenshots, OCR recognizes and extracts the information automatically.



➢ **Electronic waybill OCR**
- Automatic extraction: waybill number, and name, phone number, and address of the receiver/sender

➢ **Paper waybill OCR**
- Text and seal detection

➢ **Receipt OCR**
- Invoice information

Efficiency

Accuracy

Cost

Privacy

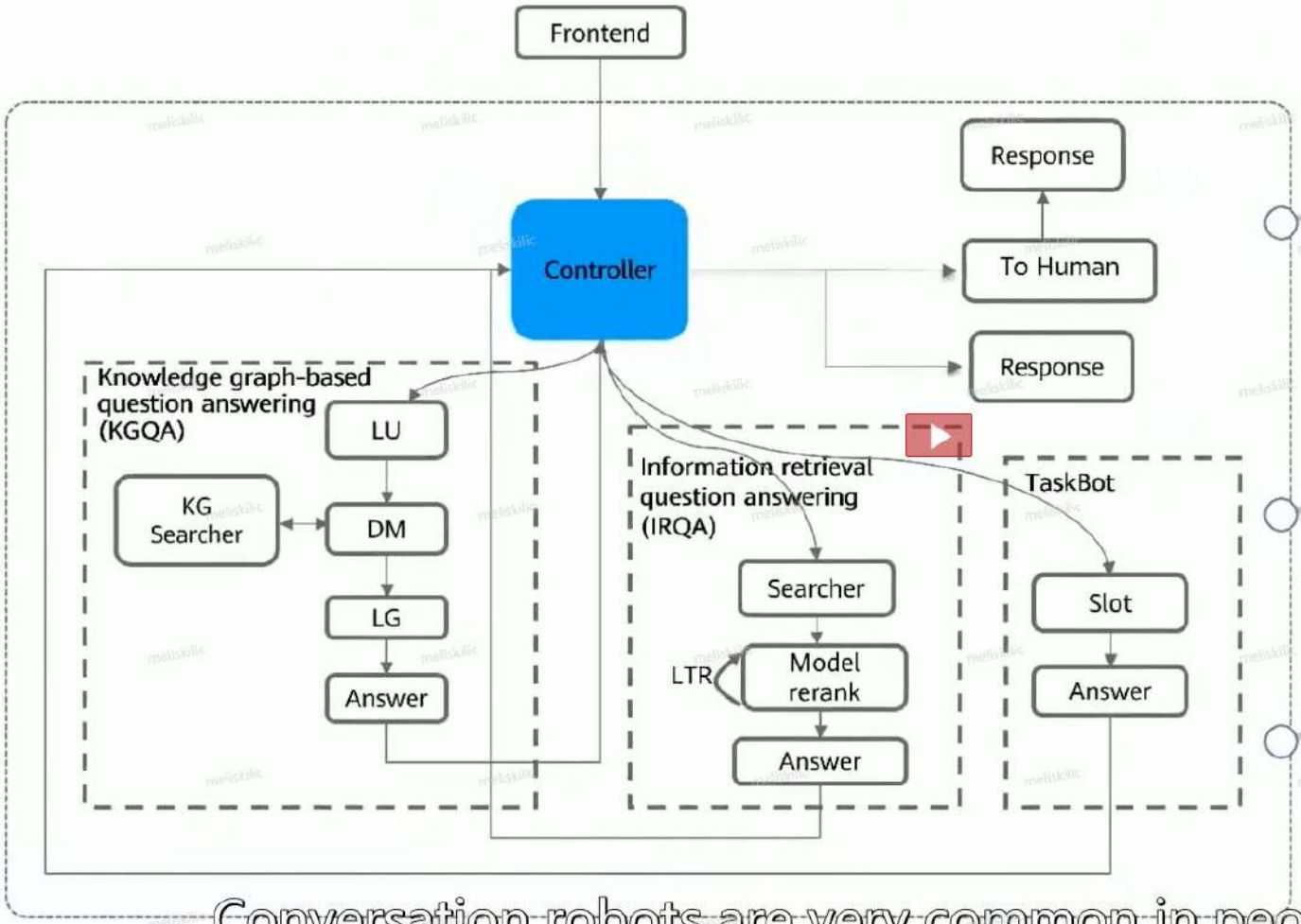
24/7 service, identification of a single waybill in only 2s

Up to 98% accuracy, reducing unnecessary reshooting and eliminating external interference

Streamlined automation process, reducing manual intervention and costs

Automatic identification without manual intervention, ensuring privacy security

CBS



Intelligent integration of multiple robots for more comprehensive services

Robots with respective advantages are integrated and can automatically learn knowledge and optimize services to recommend optimal answers to customers.

Intelligent guidance via multiple rounds of interactions to better understand you

Multiple rounds of natural interactions are performed to accurately identify users' intentions and understand users' hidden meanings.

Knowledge graphs for more intelligence

Common domain language models + domain knowledge graphs
Dynamic updates of graph content
More intelligence of graph-based robots

Conversation robots are very common in people's daily lives

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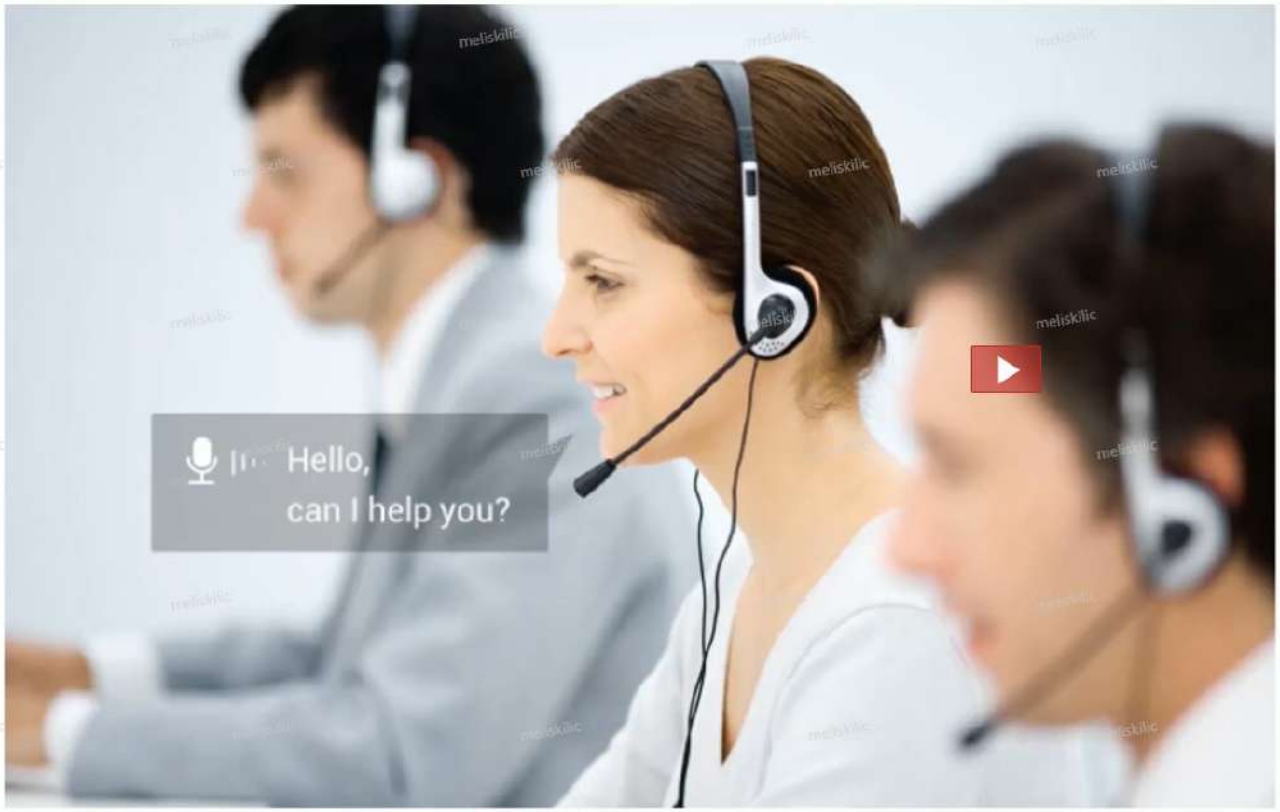
Case: Intelligent Q&A of Enterprises in a Certain District



Agent Assistant

Improves productivity and customer satisfaction with real-time analysis and helps on improving the interaction between agents in the call center and customers. During a call, the bot automatically extracts keywords, coils problems, searches for and displays the best answers to matching semantics, and provides real-time support for agents.

Advantages

- **Real-Time Support**

  Offers real-time support for human agents by attempting to understand customer questions and matching the answers with high relevancy.

- **Improved Efficiency & Satisfaction**

  Enables human agents to answer customers' questions at a faster speed.

the bot's service performance

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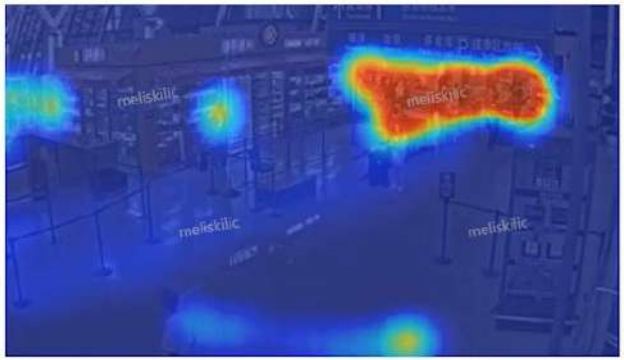
Case: Crowd Statistics and Heat Map

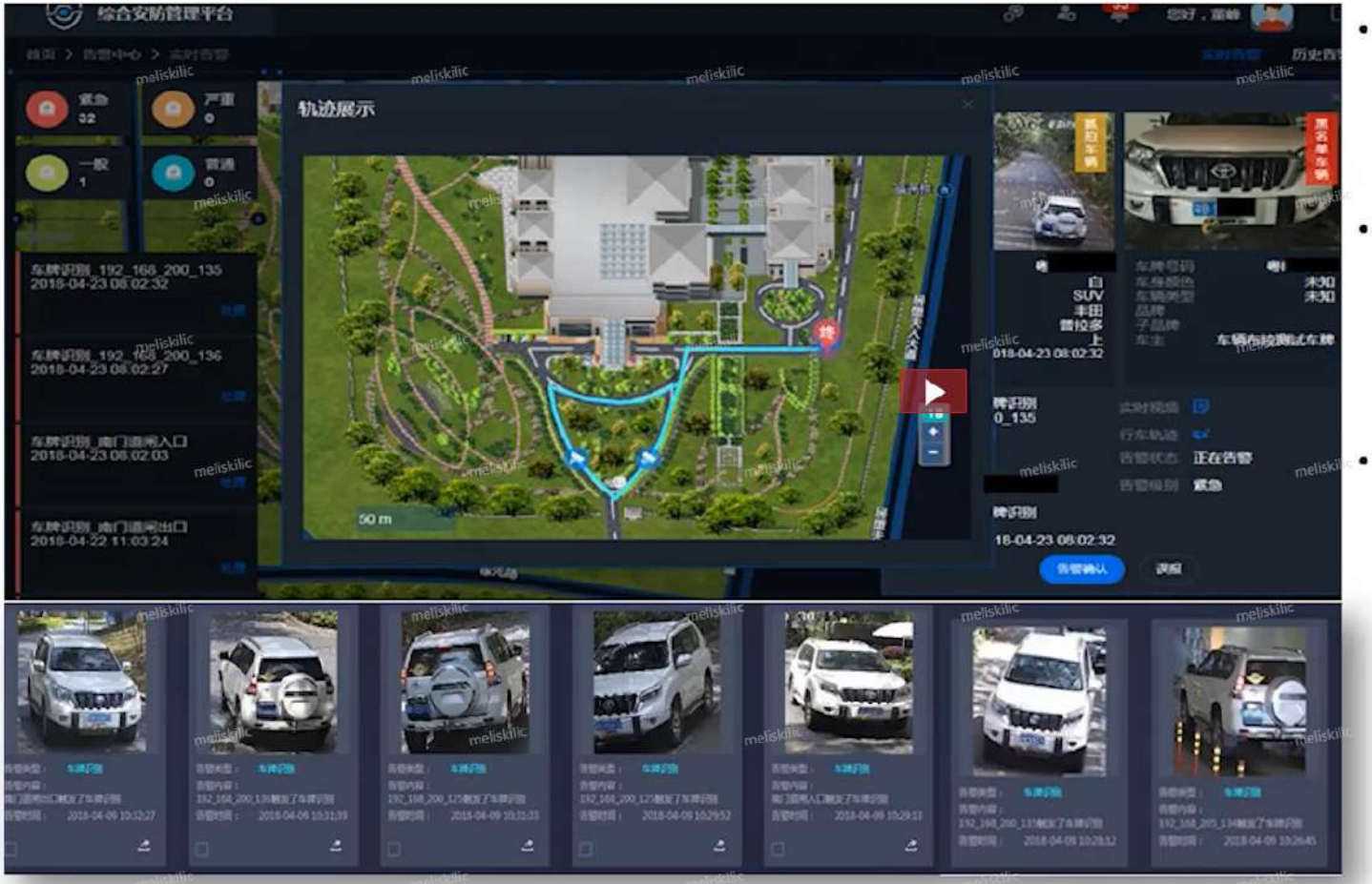


Region crowd heat map

- Functions:
  - Counting the crow in an image.
  - Collecting popularity statistics of an image.
  - Supporting customized time settings.
  - Enabling configurable intervals for sending statistics results.
- Scenarios:
  - Customer traffic statistics
  - Visitor statistics
  - Business district popularity identification
- Advantages:
  - Strong anti-interference performance: crowd counting in complex scenarios, such as face blocking and partial body blocking
  - High scalability: concurrent sending of pedestrian crossing statistics region statistics, and heat map statistics
  - Ease-of-use: compatible with any 1080p surveillance camera

Traffic is the blood of the city

Case: Vehicle Recognition



- **Functions:**
  - Vehicle model detection
  - Vehicle color recognition
  - License plate recognition (LPR)
- Scenarios:
  - Campus vehicle management
  - Parking lot vehicle management
  - Vehicle tracking
- **Advantages:**
  - Ease-of-use: Compatible with any 1080p surveillance camera

Case: Intrusion Detection

Area intrusion detection

Vehicle tripwire crossing detection

Functions:

- Extracting moving objects from a camera's field of view and generating an alarm when an object crosses a specified area.
- Setting the minimum number of people in an alarm area.
- Setting the alarm triggering time.
- Setting the algorithm detection period.

Scenarios:

- ➢ Identification of unauthorized access to key areas
- ➢ Identification of unauthorized access to dangerous areas
- ➢ Climbing detection

Advantages:

- ✓ **High flexibility**: settings of the size and type of an alarm object
- ✓ **Low misreporting rate**: people/vehicle-based intrusion alarm, without interference from other objects
- ✓ **Ease-of-use**: compatible with any 1080p surveillance camera

This figure gives an example of intrusion identification

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