

Dartmouth Workshop: Birth of AI



In 1956, the concept of artificial intelligence was officially proposed



AI

Capability

Technology

Listen

Speech recognition, machine translation, etc.

See

Image recognition, text recognition, etc.

Speak

Speech synthesis, man-machine dialogue, etc.

Think

Man-machine game, theorem proving, etc.

Learn/Predict

Machine learning, deep learning, knowledge representation, etc.

Act

Robots, self-driving cars, etc.

Development of AI in ICT

● AI popularity

Moore's Law

AI winter I

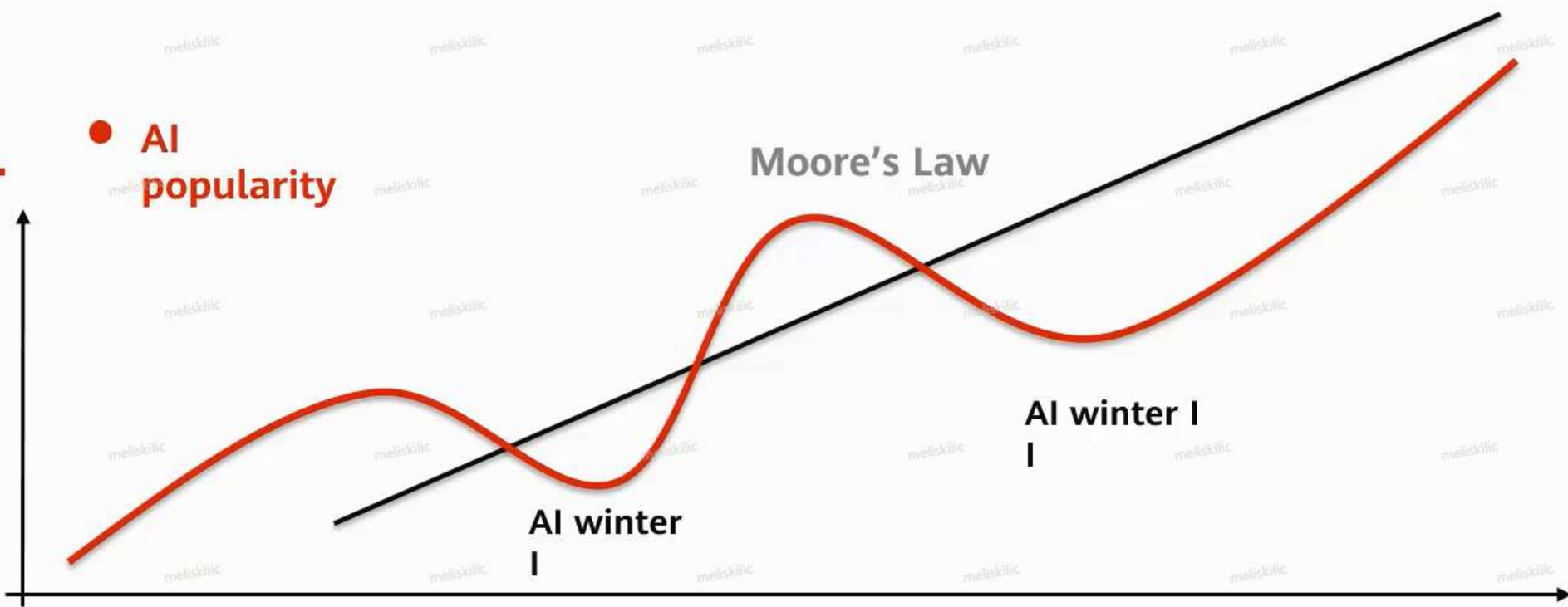
AI winter I

1956

1970s

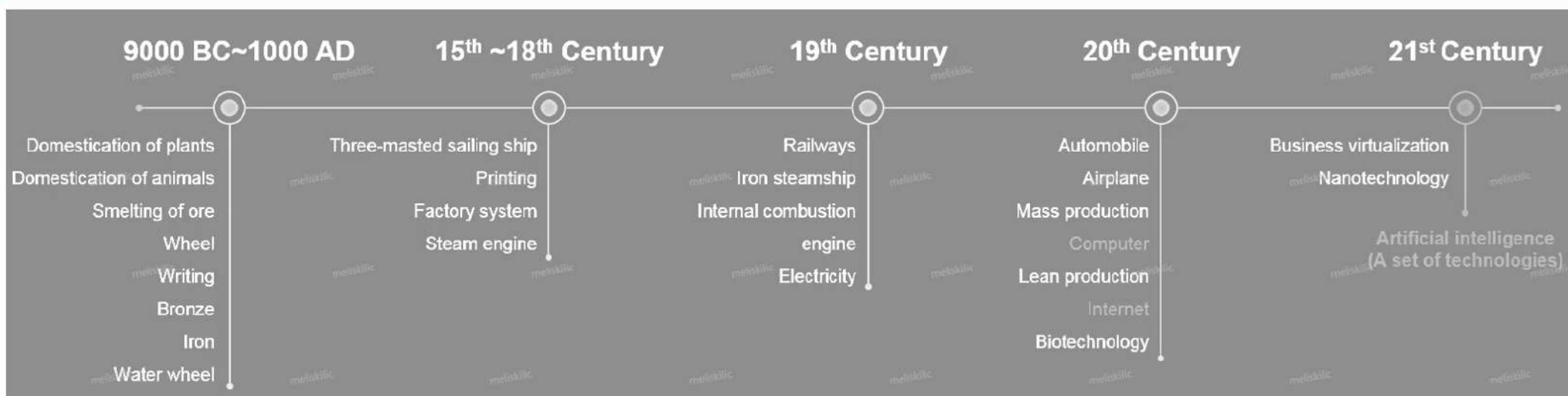
1990s

2010s





AI is a new general purpose technology (GPT)



**Multiple uses across the economy
spillovers**

Many technological complementarities and

https://en.wikipedia.org/wiki/General_purpose_technology

Richard G. Lipsey, etc., Economic Transformations: General Purpose Technologies and Long-Term Economic Growth

AI, a GPT, is changing all industries



Public

- Safe city
- Smart transportation
- Disaster warning



Education

- Personalized content
- Attention improvement
- Machine TA



Health

- Early prevention
- Assisted diagnosis
- Precision treatment



Media

- Real-time translation
- Abstract
- Content review



Logistics

- Path planning
- Goods monitoring
- Automatic sorting



Pharmaceuticals

- Shortened period
- Precise test
- Precision medicine



Finance

- Doc processing
- Real-time anti-fraud
- Precise recommendation



Insurance

- Efficient authentication
- Counter-Measure of Service Fraud
- Product innovation



Retail

- Self-service supermarkets
- Real-time inventory
- Precise recommendation



Manufacturing

- Quality check
- Industrial IoT
- Predictive maintenance



Oil and gas

- Precise drilling
- Remote maintenance
- Operation optimization



Telecommunication

- Customer service
- Network maintenance
- Network optimization

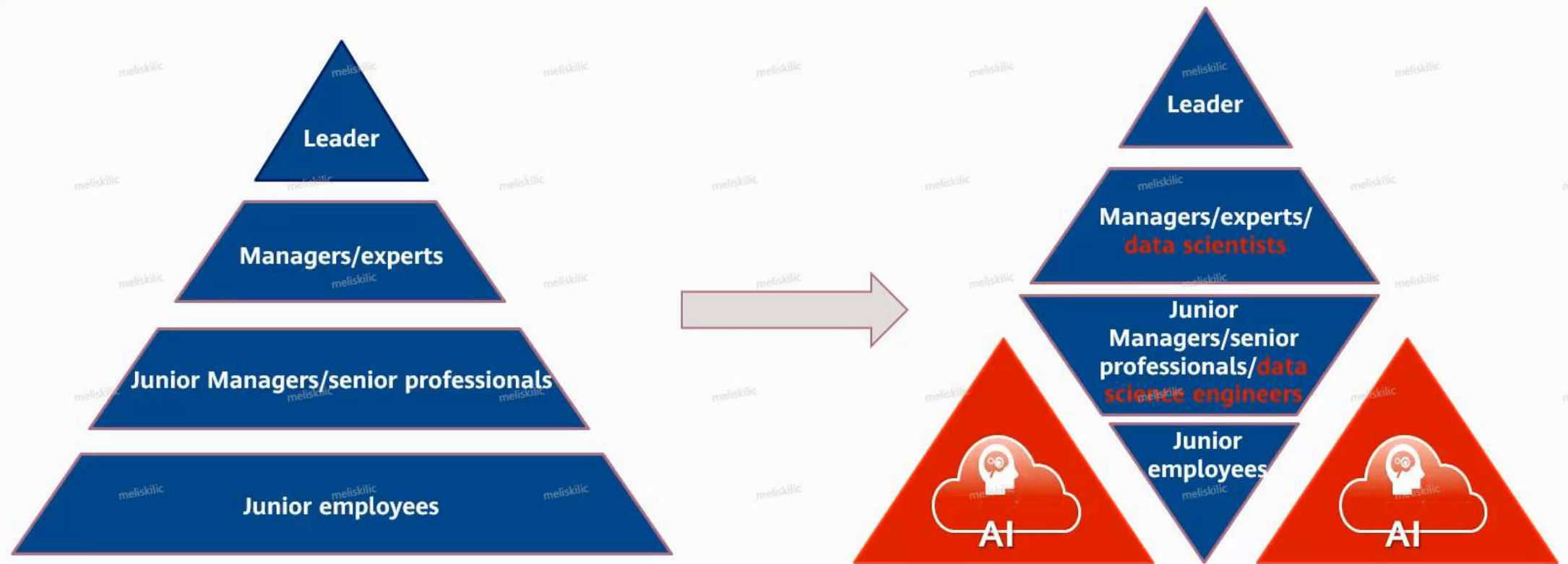


Agriculture

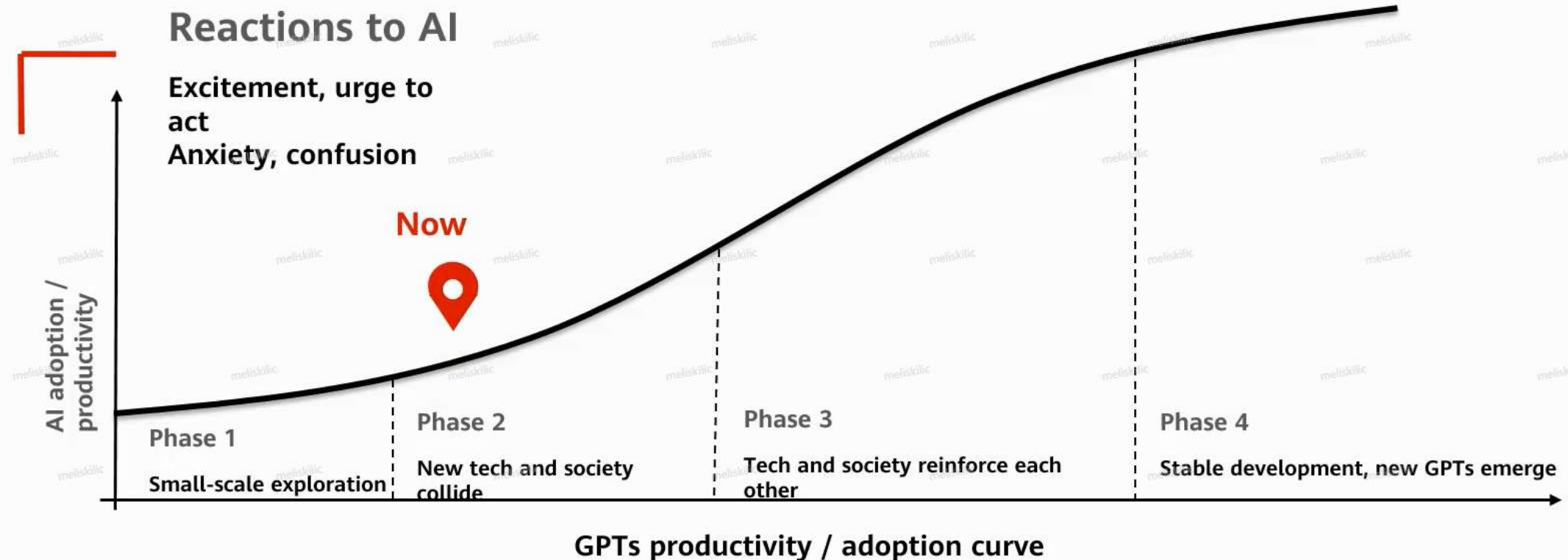
- Fertilization optimization
- Remote work
- Efficient breeding



AI will change every organization



AI-triggered change has just begun



Inspiring gaps we see today

Training in days or even months

Scarce & costly computing power

AI: Mostly in cloud, some at the edge

Today's basic algorithms invented before the 1980s

No labor, no intelligence

Models perform better in tests

Updates not in real time

Inadequate integration with other technologies

As Is

Only highly-skilled experts can work with AI

Scarcity of data scientists

Training in minutes or even seconds

Abundant & affordable computing power

Pervasive AI for all scenarios. Respects and protects user privacy

Data and energy-efficient, secure, and explainable algorithms

Automated / semi-automated data labeling

Industrial-grade AI, perform excellently in execution

Real-time, closed-loop system

Synergy between AI and cloud, IoT, edge computing, blockchain, big data, databases, etc.

AI as a basic skill, supported by one-stop platforms

Data scientists + Subject matter experts + Data science engineers

To Be



10 changes Create the future



Model training

As is

To be

Days
or even months

Minutes
or even seconds

10 changes Create the future

2

Computing power

As is

To be

Scarce
& costly

Abundant
& affordable



10 changes Create the future



AI development

As is

To be

Mostly in the cloud
some at the edge

Pervasive AI for all scenarios
Respects and protects user privacy



10 changes Create the future

4

Al gorithms

As is

To be

Today's basic algorithms
invented before the 1980s

New algorithms are data and energy-
efficient, secure and explainable



10 changes Create the future

5

AI automation

As is

To be

No labor
No intelligence

Automated/semi-automated
data labeling, data collection, feature
extraction, model design, training, etc.



10 changes Create the future



Practical application

As is

To be

Model perform
better in tests

Industrial-grade AI,
perform excellently in execution

arXiv.org > cs > arXiv:1806.00451

Computer Science > Machine Learning

Do CIFAR-10 Classifiers Generalize to CIFAR-10?

Benjamin Recht, Rebecca Roelofs, Ludwig Schmidt, Vaishaal Shankar

(Submitted on 1 Jun 2018)



10 changes Create the future



Model updates

As is

To be

Updates
not in real time

Real-time,
close-loop system



10 changes Create the future

8

Multi-tech synergy

As is

To be

Inadequate integration with
other technology

Synergy between AI and cloud, IOT,
edge computing, blockchain, databases,
big data, etc.



10 changes Create the future



Platform support

As is

To be

Only high-skilled experts
can work with AI

AI as a basic skill, supported by one-
stop platforms



10 changes Create the future

10

Talent availability

As is

To be

Scarcity of data
scientists

Data scientists + Subject matter
experts + data science engineers



Strategy for AI development

**Invest in
basic
research**

**Build a full-
stack AI
solution**

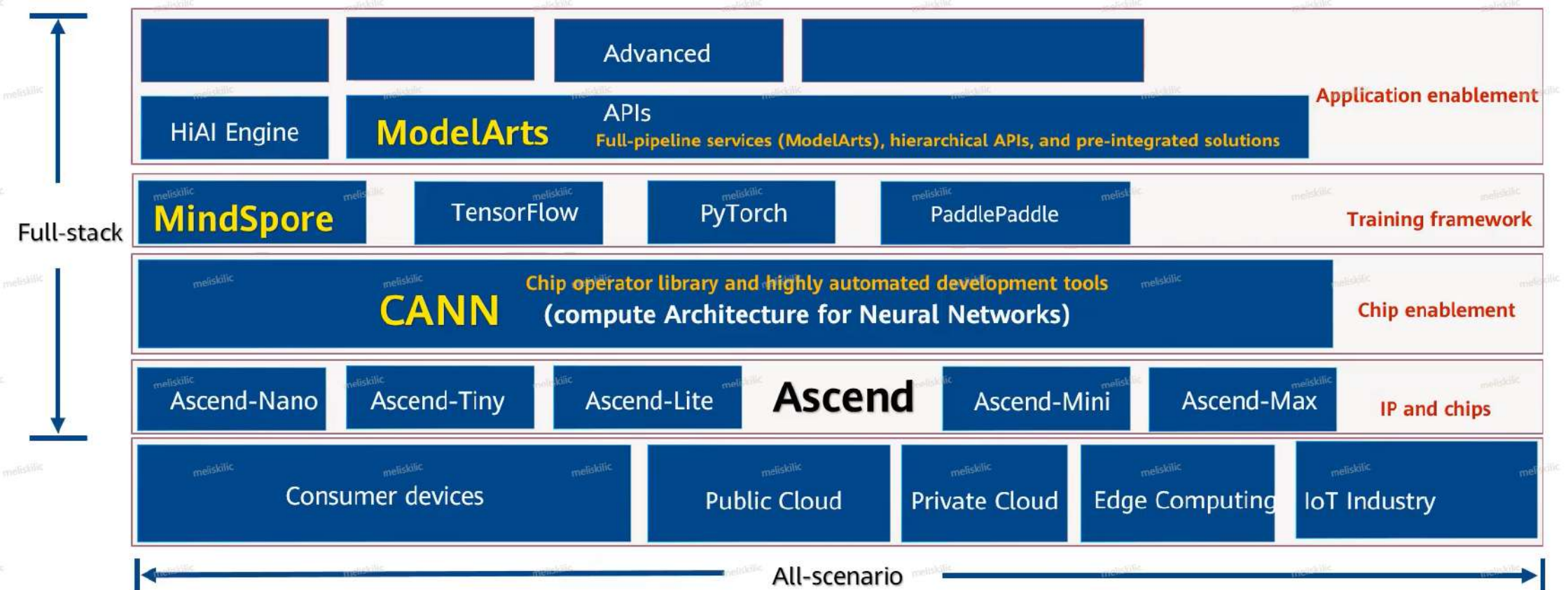
**Invest in open
ecosystem and
talent cultivation**

**Enhance
existing
solutions**

**Improve
internal
efficiency**

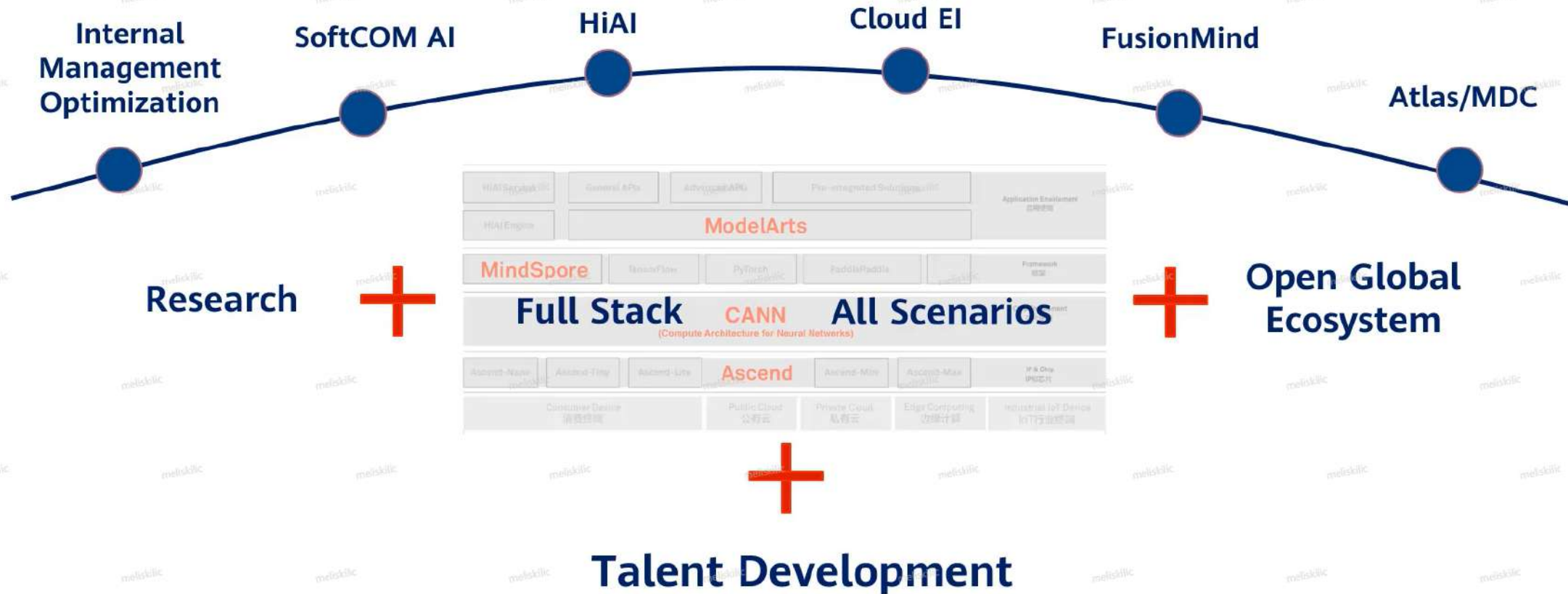


Full-stack, All-scenario AI solution





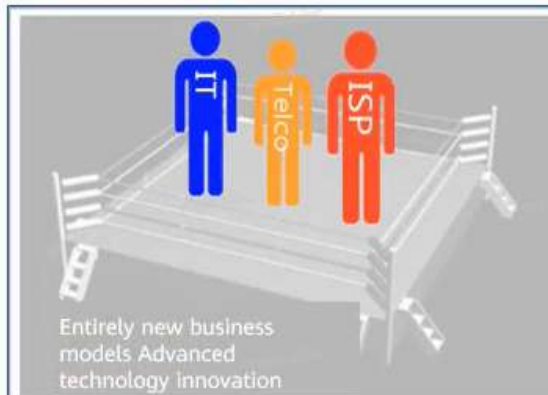
Huawei's AI strategy highlights



Telecom Network

The Structural Problems of Telecom Industry

- **OPEX: 3~4X of CAPEX**
- Reduce equipment cost cannot change operators' cost structure



- Network complexity beyond O&M personal ability
- **70% fault** is from the wrong operation of **O&M** staff



- **OTT competition:** High efficiency & low cost
- More advanced Technology used by OTT





HiAI platform



Cloud

HUAWEI HiAI Service



Device

HUAWEI HiAI Engine



Chip

HUAWEI HiAI Foundation