Developing Data Science in Autonomous factory -

Bringing AI into Industrial Application

Dr. Abhisak Chulya
Executive Directors of iCTi, FTI
CEO & Founder, NIPA Cloud

nipa.cloud

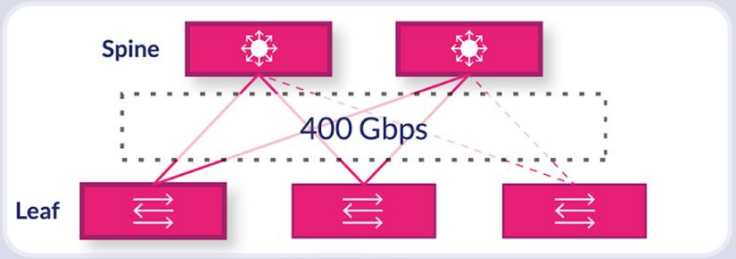
DR. Abhisak Chulya

- Bachelor of Civil Engineering, Chulalongkorn University, 1980
- Doctor of Engineering, Cleveland State University, 1987
- Senior Research Scientist, NASA, USA, 1988 – 1995
- 22 Research Papers published in Refereed International Journals
- Executive Director, Country Code Top Level Domain Name, 1997 - 1999
- Director, Thailand Science Park, NSTDA, 1999 – 2000
- Executive Committee Office of Science and Technology (NSTDA), 2002 – 2003
- Chairman, Board of Directors, Asia & Pacific Internet Association (APIA), 2002 – 2006
- CEO, & Founder, NIPA Technology Co., Ltd.
  NSAVVY, Digital Marketing Agency
  NIPA Cloud
  NIPA Cloud Strategy & Consulting Services

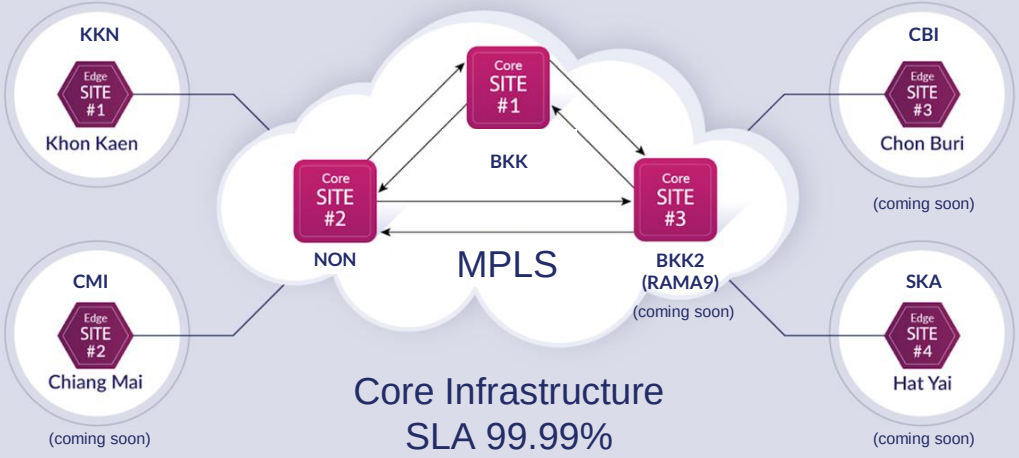
MESSAGE:

”Digital marketing technology and cloud computing are truly the foundation of digital transformation”

Fabric Networking

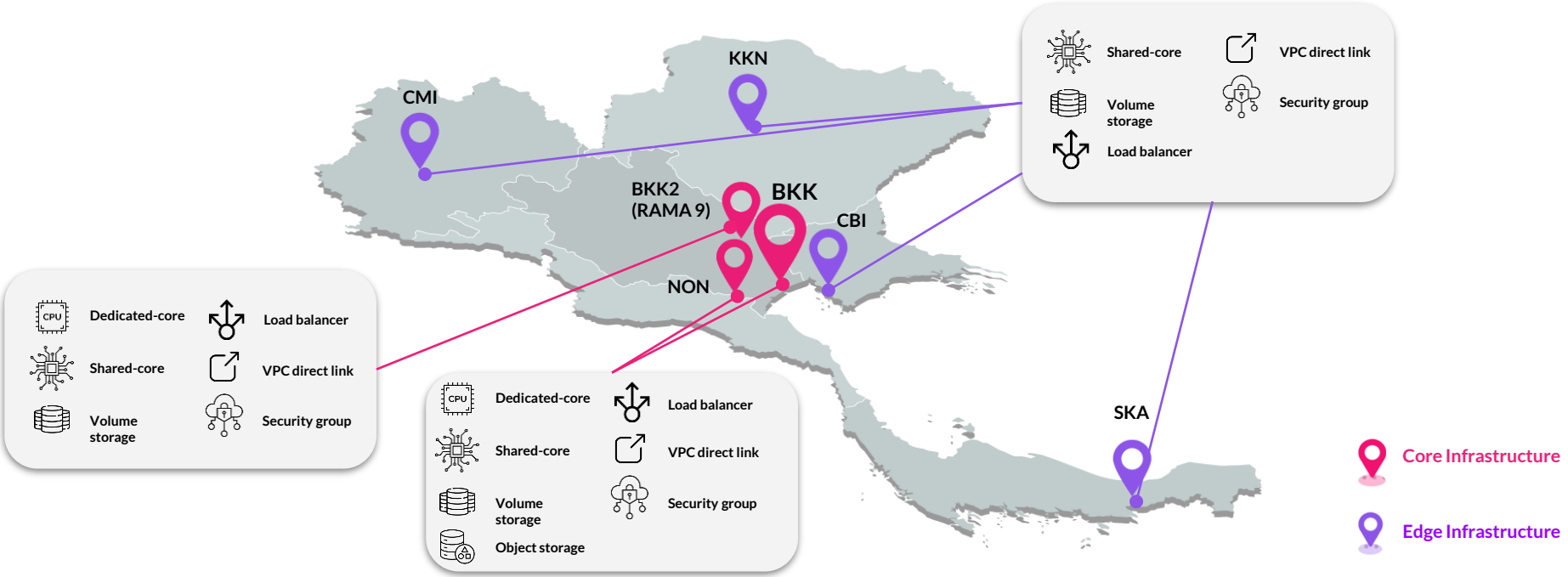


- Scale out capability
- No broadcast domain
- L3 BGP (Fabric)

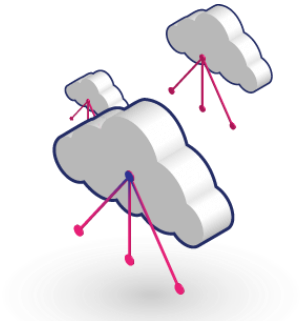


Core Infrastructure
SLA 99.99%

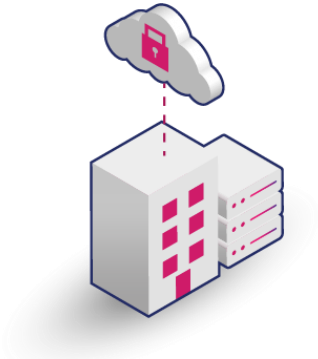
NIPA Public Cloud Network



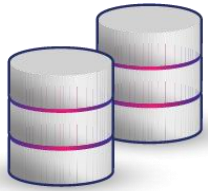
NIPA Cloud Services



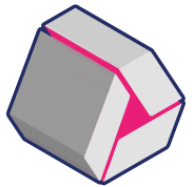
Public Cloud
NIPA Cloud Space
(NCS)



CybEdge
(Private Cloud)



Cloud Storage



NIPA Drive

Agenda

Data Science ***AI***

1. State of Thailand Industries
2. Why we need to transform
3. Digital Transformation ——> Mobile-First
4. Collecting data
5. AI Transformation ——> AI-First
6. Success Case: Auto Industry
7. Use Case: IoT Platform
8. Predictions: Q&A

การแบ่งระดับการพัฒนาอุตสาหกรรมไทย และสัดส่วนปริมาณอุตสาหกรรม

ระดับอุตสาหกรรม	องค์ประกอบหลัก	สัดส่วนอุตสาหกรรม
INDUSTRY 2.0	• มีการใช้พลังงานไฟฟ้า • มีการใช้สายพานลำเลียงเพื่อการขนย้าย • เครื่องจักรมีต้นกำลังจากพลังงานไฟฟ้า	40%
INDUSTRY 2.5	• มีกระบวนการผลิตเป็น Mass Production • มีสายพานลำเลียงเพื่อการประกอบ • มีระบบไฟฟ้าควบคุมด้วยรีเลย์เป็นกึ่งอัตโนมัติ • มีการควบคุมเครื่องจักรด้วยระบบตัวเลข (Numeric Control)	35%
INDUSTRY 3.0	• มีการใช้เครื่อง CNC (Computer Numerical Control) • มีการนำ PLC มาใช้ควบคุมการทำงานของเครื่องจักร • มีการใช้หุ่นยนต์เข้ามาช่วยในกระบวนการผลิต • มีการใช้ระบบบริหารจัดการทรัพยากรองค์กร (ERP)	20%
INDUSTRY 3.5	• มีการใช้ Computer ควบคุมการทำงานทั้งระบบภายในองค์กร • มีการใช้ Barcode หรือ RFID แสดงตัวตนให้ระบบรับรู้ • มีการใช้ระบบบริหารจัดการและวางแผนการผลิต(MRP) • มีการติดต่อสื่อสารผ่านระบบ Network ภายในองค์กร	5%

ที่มา : ผลการสำรวจข้อมูลเบื้องต้นของสภาอุตสาหกรรมแห่งประเทศไทย

DIGITAL
DISRUPTION

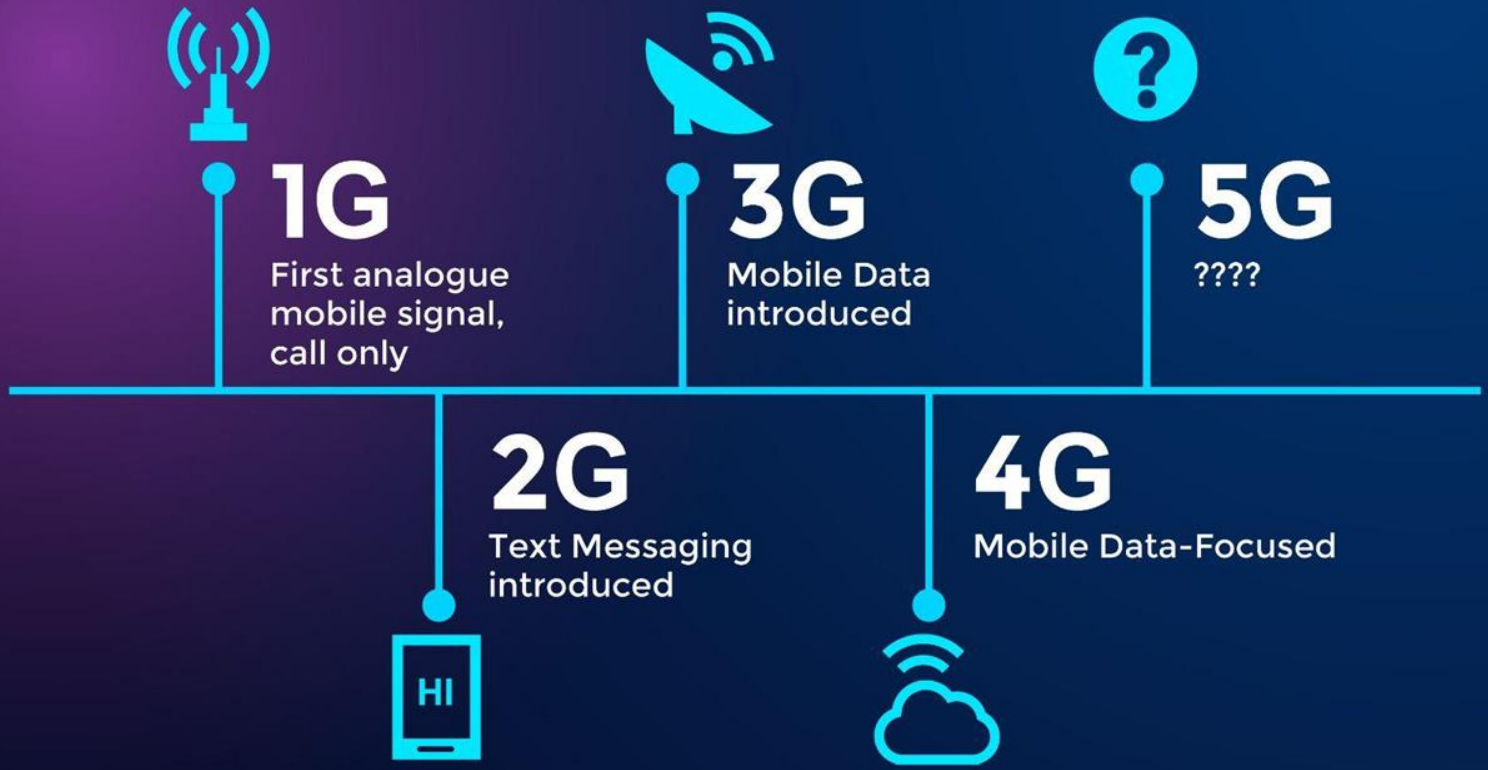
PC Era

1980 - 1990

Internet Era

1995 - 2007

Mobile Internet Era 2007 - Present



Mobile-First

To

AI- First

Digital Transformation

is the process of integrating digital technologies into all aspects of business to meet the market and changing business requirements

The Difference between Transformation & Innovation

Transformation - Changing the way existing business operates

Innovation - Creating new business lines based on the latest technology

The Path to Digital Transformation

Modernize the Old and Build the New

No need to choose one path over other

Industrial 4.0 / Smart Manufacturing

Fourth Industrial Revolution is the trend towards automation and data exchange in manufacturing technologies and processes which include cyber-physical systems (CPS), IoT, industrial internet of things, ***cloud computing***, cognitive computing, and ***artificial intelligence***.

The machines cannot replace the deep expertise but they tend to be more efficient than humans in performing repetitive functions, and the combination of machine learning and ***computational power*** allows machines to carry out highly complicated tasks

What are trending technologies in DT?

1. Robotic process automation
2. Cloud technologies (Public, Private, and Hybrid Cloud)
3. IoT and Edge Computing
4. Cyber Security
5. Blockchain
6. Data Privacy: GDPR or PDPA
7. Telecommuting
8. Process Mining
9. Omnichannel
10. Artificial Intelligence

Data Science & Machine Learning for business

Empower employees

Transform products

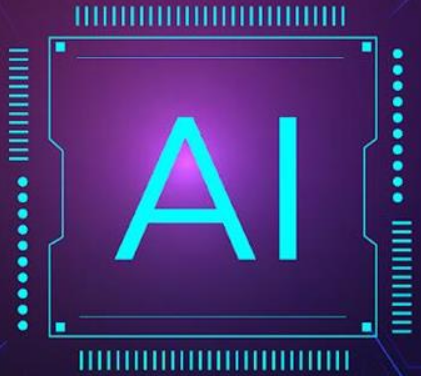
Optimized operations

Engage customers

We must start collecting all DATA!

Next 15 years will be about….Data Era
Collecting data, Prediction, Artificial Intelligence because

More Data, Better model, & Cheap Computing Power/Storage



TRANSFORMATION

Dr. Abhisak Chulya, CEO
NIPA Cloud

Artificial Intelligence (AI)

Critical component of intelligence is……..

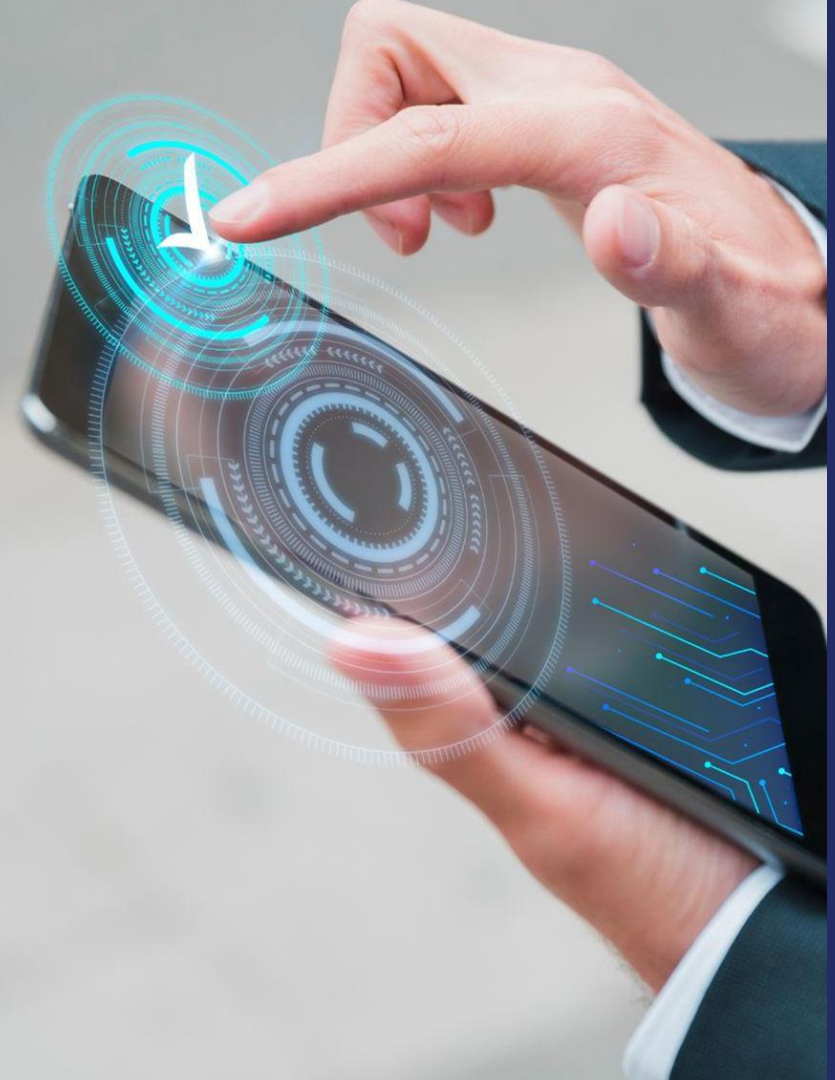
“ Prediction ”

is the process of filling in missing information. Prediction takes information you have, often called ‘Data’, and used it to generate information you don’t have.

“Prediction” is a central input into decision-making…Sniper!

What is AI Transformation? Why now?

- After adopt digital processes, next step is to improve of the intelligence of these processes by increasing the level of automation and effectiveness.
- Modern enterprises such as Facebook, Google (AI-first organization), Line are integrating AI into their processes and products.
- IDC estimates that 90% of new organizations will insert AI technology by the year 2025.
- AI is a tool and it has many modeling and algorithms such as machine learning model: Face recognition, Face detection, Object tracking, Demographic recognition, etc.
- AI adoption is a major competitive advantage



AI Transformation in Business - Use Cases

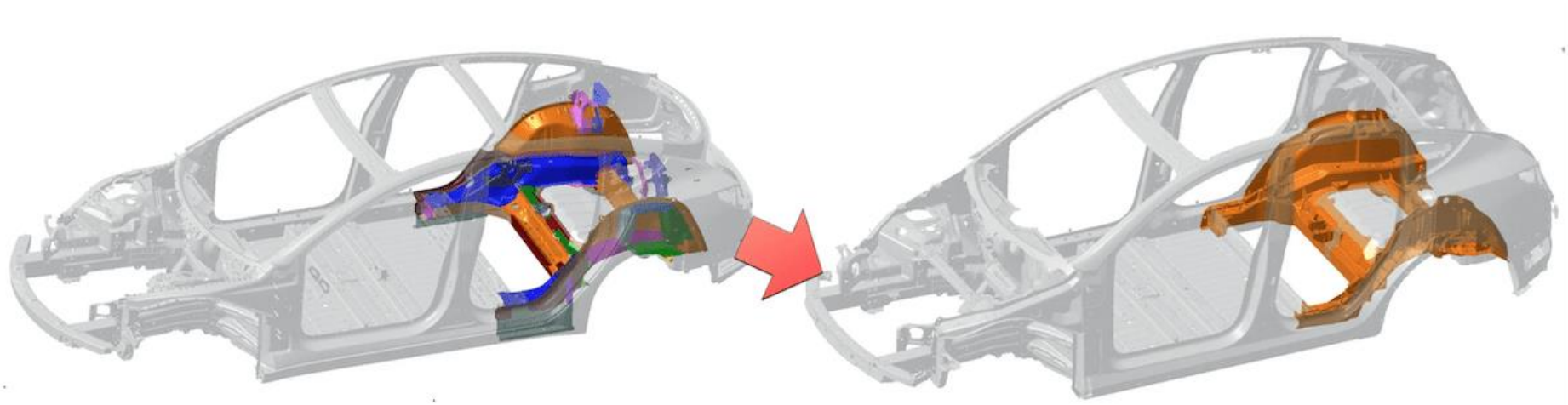
- Financial services: Debt collection, credit scoring, fraud detection
- Automotive: autonomous vehicles, assistant driving
- Healthcare: patient monitoring, disease diagnosis, drug discovery, gene analytics, pregnancy management, medical imaging
- Human Resources: Hiring, employee monitoring
- Retail: supply chain optimization, sales planning, self checkout
- Manufacturing: prescriptive maintenance, product design, process optimization, quality assurance, cost reduction, inventory management
- Telecommunication: Network management, operations, infrastructure analytics
- Government: Surveillance analysis, transportation

Success Story

Tesla is revolutionizing automobile industry

Tesla transformed mechanical to digital

- Tesla is a very sophisticated computer on wheels
- Tesla treats itself as a software company as much as a hardware company
- Tesla software can be updated Over-The-Air just like iPhone
- Tesla is taking a design approach that look at a vehicle as an electronic device rather than a machine.
- Cars will be platforms for apps that can change or improve their functions rather than having their performance frozen in place at time of purchase
- Tesla Autopilot/Full-Self-Driving uses AI for its intelligence



Model 3 rear underbody
70 pieces of metal

Model Y rear underbody
2 pieces of metal (eventually a single piece)

Model 3 body structure

171 pieces of metal highlighted

Austin-made Model Y body structure

2 pieces of metal highlighted

>1,600 fewer welds

Revolution In Body + Battery Engineering

10% MASS REDUCTION | 14% RANGE INCREASE OPPORTUNITY | 370 FEWER PARTS

Tesla produces more car per week than Ford

At Fremont Factory as of 2021:

- Tesla - 8550 cars per week on average
- Toyota - 8427 cars per week at Kentucky plant
- BMW - 8343 cars per week at South Carolina plant
- Ford - 5564 trucks per week at Michigan truck plant

Tesla edges out Toyota in term of production but with half a size of plant producing far more vehicles on a per-square-foot-basis.

Flying Through Giga Berlin

Use Case

Super-Connected World with IoT Platform

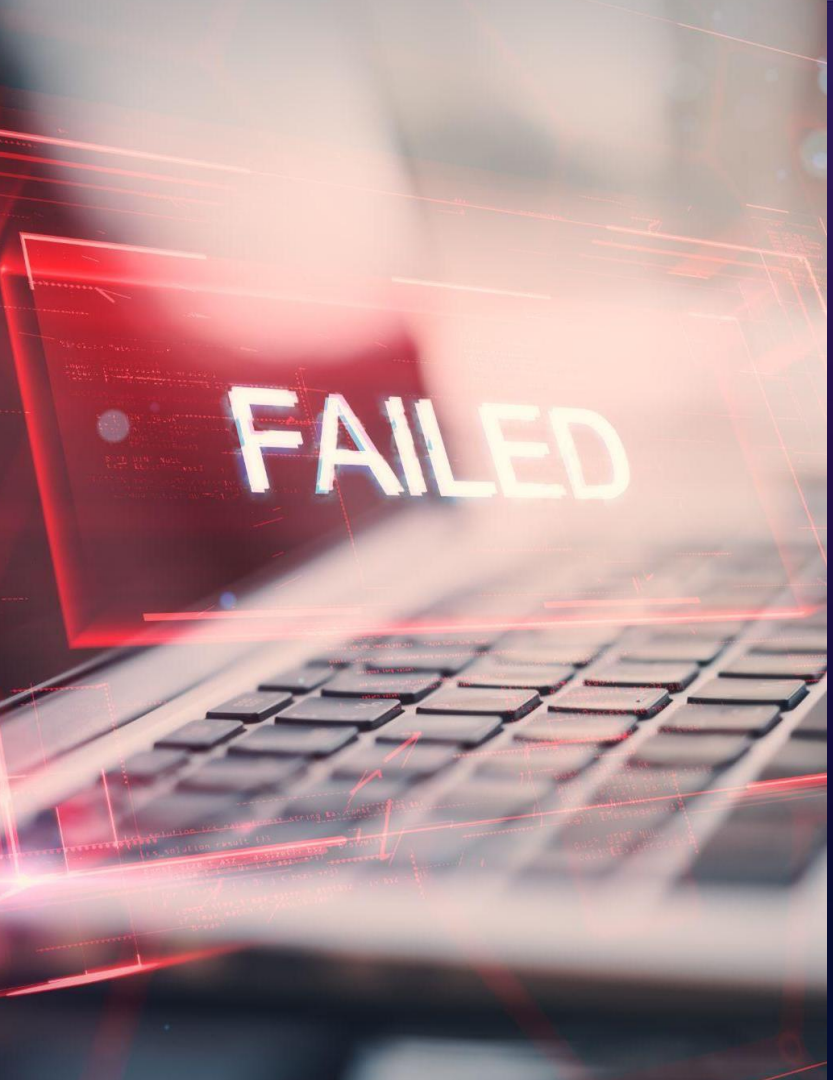
- IoT is a key component of digital transformation to create new opps.
- Will impact daily lives and open new *business models* for enterprises.
- Ecosystem of IoT consists mainly sensors/devices layer, connectivity layer and IoT platform via Internet.
- Main value of IoT is in creating use cases for efficiency, monitoring and management of the things/devices
- IoT platform will be equipped with device management to create new use cases along with data analytics and ML that provide 360 view through data insight.
- "Industry 4.0" is the virtual transformation by way of Industrial IoT which is the future of manufacturing.

Industrial IoT Deployment Strategy

- IoT evolution is an end-to-end use case. Connectivity is only 5-10% of value chain. It requires 5G, Edge, Cloud.
- From customer perspective, the most important factor is the value of IoT use case and the related *Business Case* (BC) behind it.
- Adopt digital transformation strategies and focus on monetizing the connectivity and data by using OTT applications and IoT/ICT use cases
- Positive BC is a real challenge, especially for enterprise market.

Question & Answer #1

What are the key challenges that companies face when implementing AI technologies, and how can they overcome them?



Why do AI projects fail?

1. Talent and knowledge
2. AI technology maturity
3. Top management unclear about AI value
4. Difficult to identify business use cases
5. Regulatory support
6. Data availability
7. Computing infrastructure

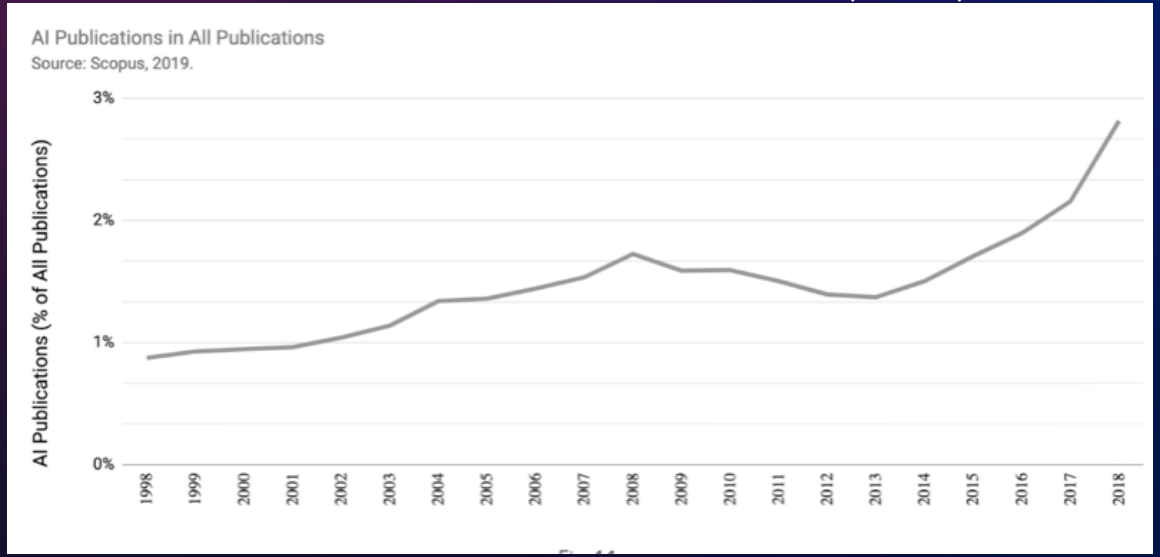
Question & Answer #2

How can companies measure the ROI of AI investments, and what metrics should they be using?

Future of AI

- Will interest in AI continue to increase?

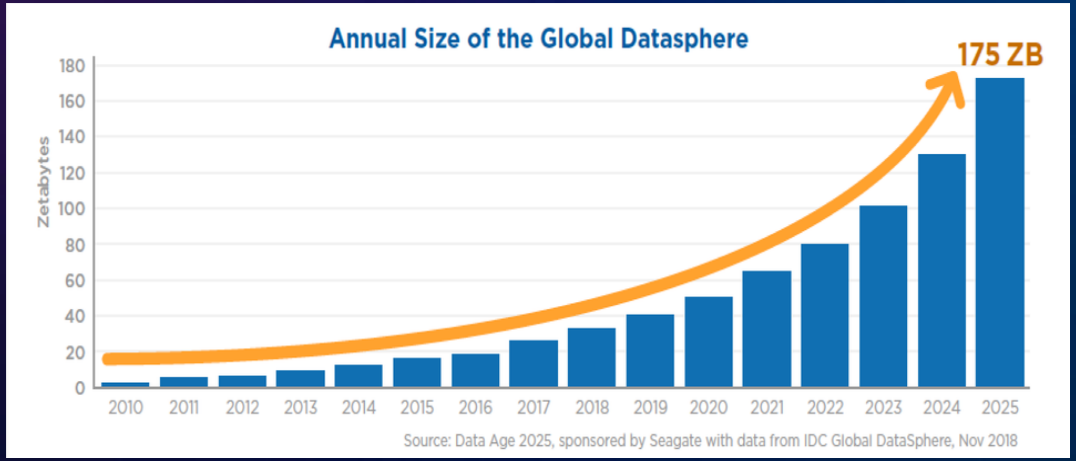
  Yes, Yes, Yes…..



Research may need to continue in new direction beyond deep learning for breakthrough AI research…..

Future of AI

- What are the key trends that will shape future of AI



What are the future technologies to be enabled by AI?

- AI use cases will shape the development of AI
- Cloud computing based use cases
- Virtual Reality/Augmented Reality (VR/AR)
- Convergence of IoT and AI

"*AUTOMATION*"

Question & Answer #3

what advice for manufactures that are just starting their AI transformation journey, and what are some best practices?

What are steps of AI transformation?

- Outline AI strategy
- Execute pilot projects to gain momentum
- Build an in-house AI transformation team
- Provide broad AI training
- Develop internal and external communications
- Update AI strategy and continue with AI transformation

Check the readiness of your manufacturer before starting transformation journey

Break the limit to Global Cloud

More efficient and faster

ช่องทางการติดต่อ

Nipa.Cloud

www.nipa.cloud

nipacloud

sales@nipa.cloud

@nipacloud

086-0194000
02-107-8252, 02-107-4124

Thank You

www.nipa.cloud | sales@nipa.cloud
Mobile: 086-019-4000 | Phone: 02-107-8252, 02-107-4124