

Drivers of the Digital Transformation

Holistic view of the opportunities and risks by new technologies
and its implication to ICT industry



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2017. 5. 10

Asia-Pacific Digital Societies Policy Forum 2017

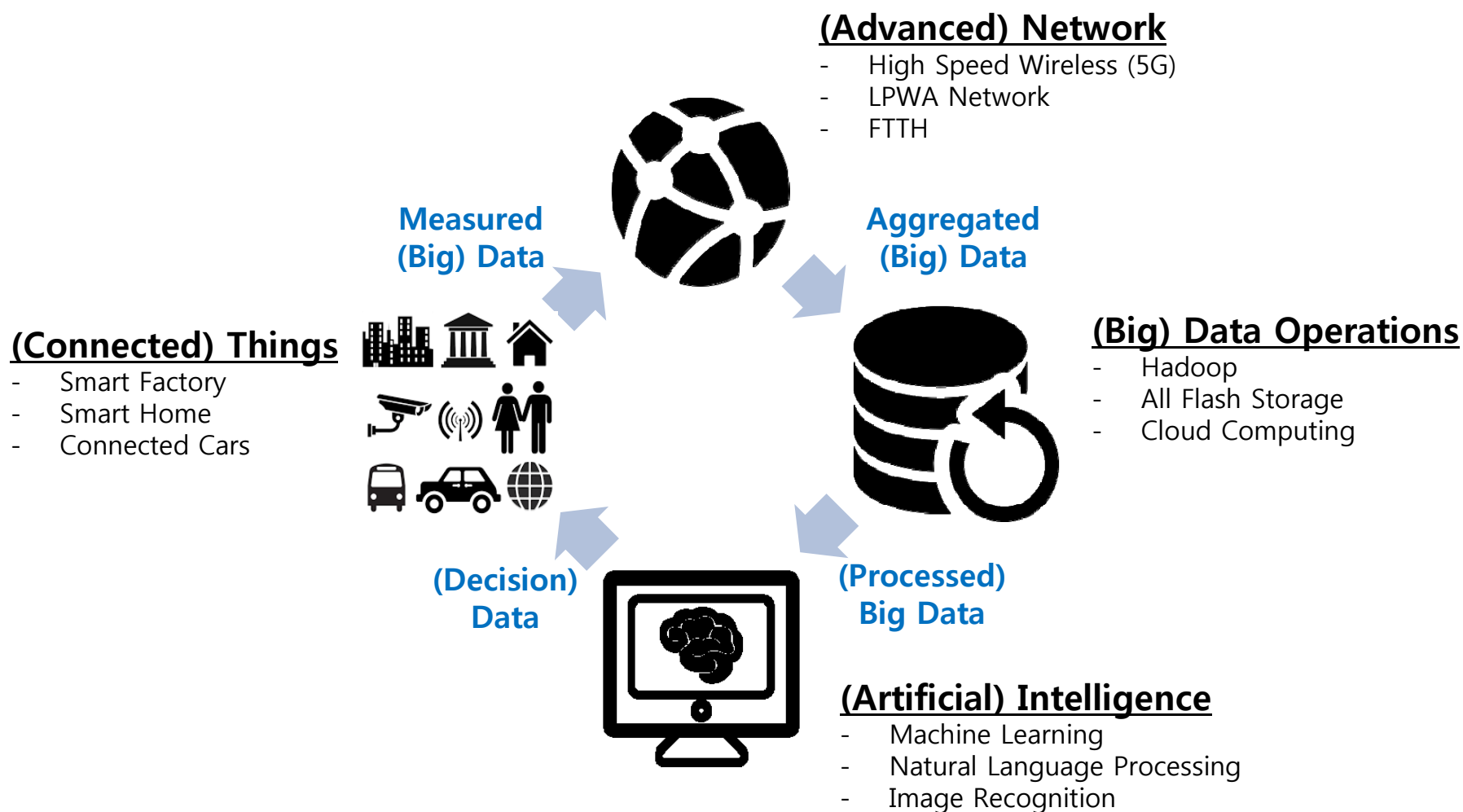
World of Buzzwords and Hypes

Simply too many “abstract” concepts around, without much “content”



Digital Transformation World, Driven by Data

Data is the new oil, but to be processed like gas, plastic, and chemical does



(Philosophical) Paradigm Changes

Rationalism vs. Empiricism



Rene Descartes

Philosopher's Version

Knowledge and Truth can be gained through rational / deductive thinking originated from intuition

IT guy's Version

I can understand the rules and logics of the thing and I can program the rules and logics to describe



David Hume

Philosopher's Version

What we see determines the what's the nature of the world, and not necessary to understand all the rules

IT guy's Version

I can grab the bunch of input and output data and I can make the rules and logics to describe .

(Supply - Demand) Paradigm Changes

Most of the “Goods” is in oversupply, hence efficiency management, , with the help from the digital transformation, becomes critical.



Oversupply of the Oil

Crude oil price down over 50% in the last 2 years.



Virtual Power Plant

NEXT
KRAFTWERKE

Over 2.5GW capacity
operating over 7 countries



Oversupply of the Cars

Cars are usually parked in 95% of the time.



Car Sharing Services



U B E R

Now racing to autonomous
vehicle to save the cost



Oversupply of the Affordable Restaurants

More than 40,000 fried chicken restaurants in Korea



Food Delivery Apps



Korea's #1 food delivery app
takes care of over 10M
orders per month



Oversupply of the Housing

In US, over 220K houses were built / month in 2006, and owners still pay mortgage.



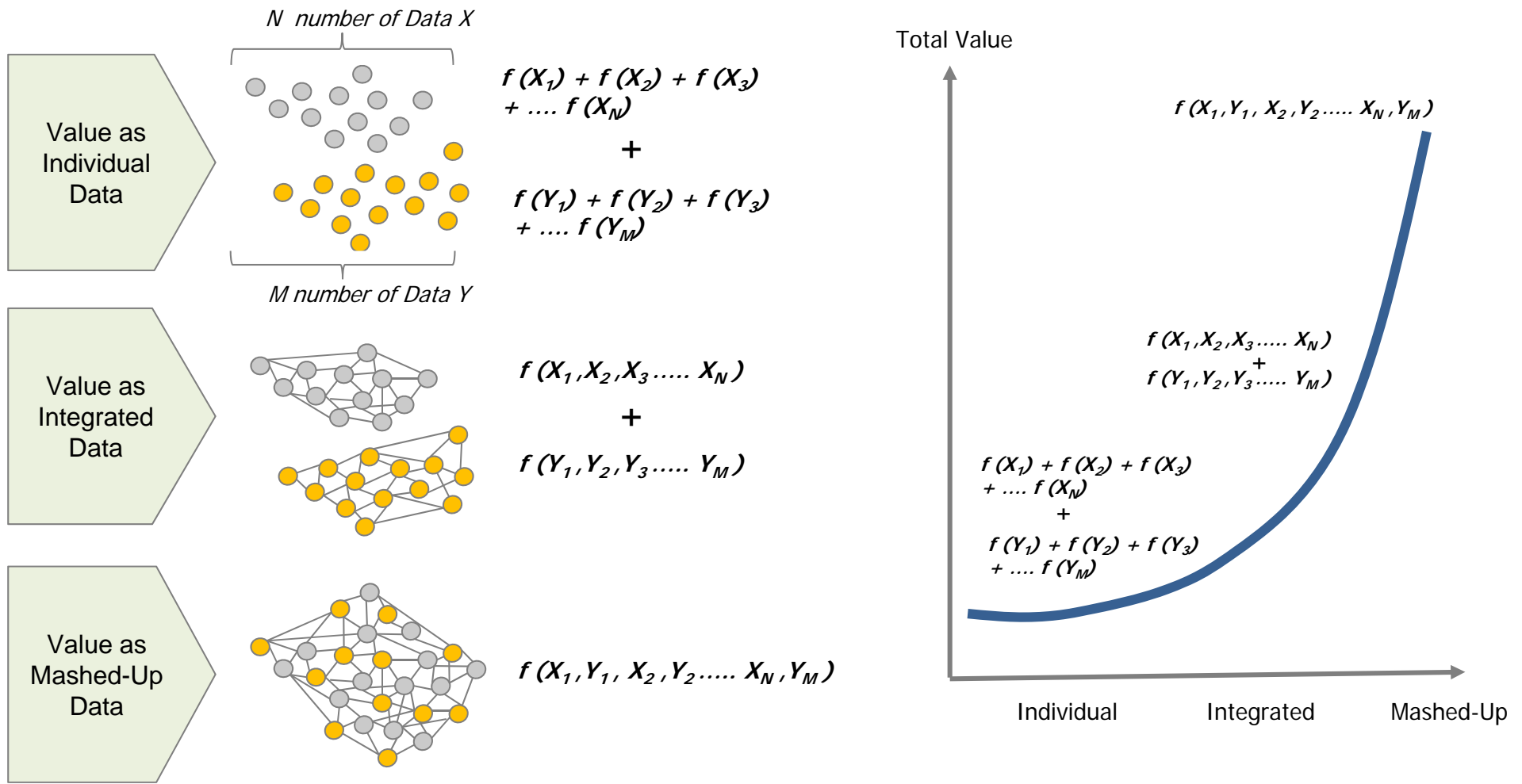
Lodging Sharing Services



Most valuable lodging
service companies without
owning any property.

Value Progression of the Data

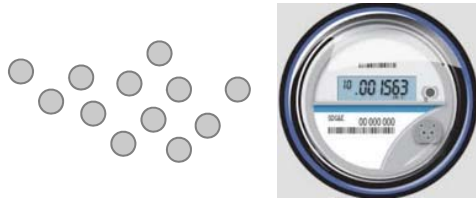
Integrated, diverse data would provide exponential value



Value Progression Example

The value from the AMI measurement data progresses exponentially

Value as Individual Data

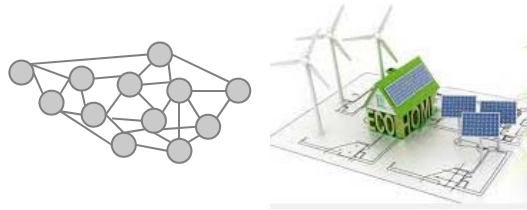


Replacing the existing electricity metering device to wireless based IoT meter (called AMI)



- Reducing the labor cost to visit and record the meter reading
- Stop supplying right away when the payment is overdue

Value as Integrated Data

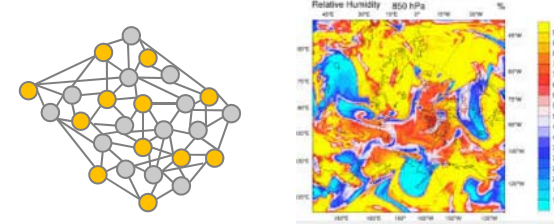


Monitoring the electricity usage of an area and matching the demand and supply



- Smart grid program to sell the excessive electricity.
- Efficiency by monitoring and reacting in real time by analyzing the trend

Value as Mashed-Up Data



Cross analysis with other diverse data such as climate, traffic, moving population

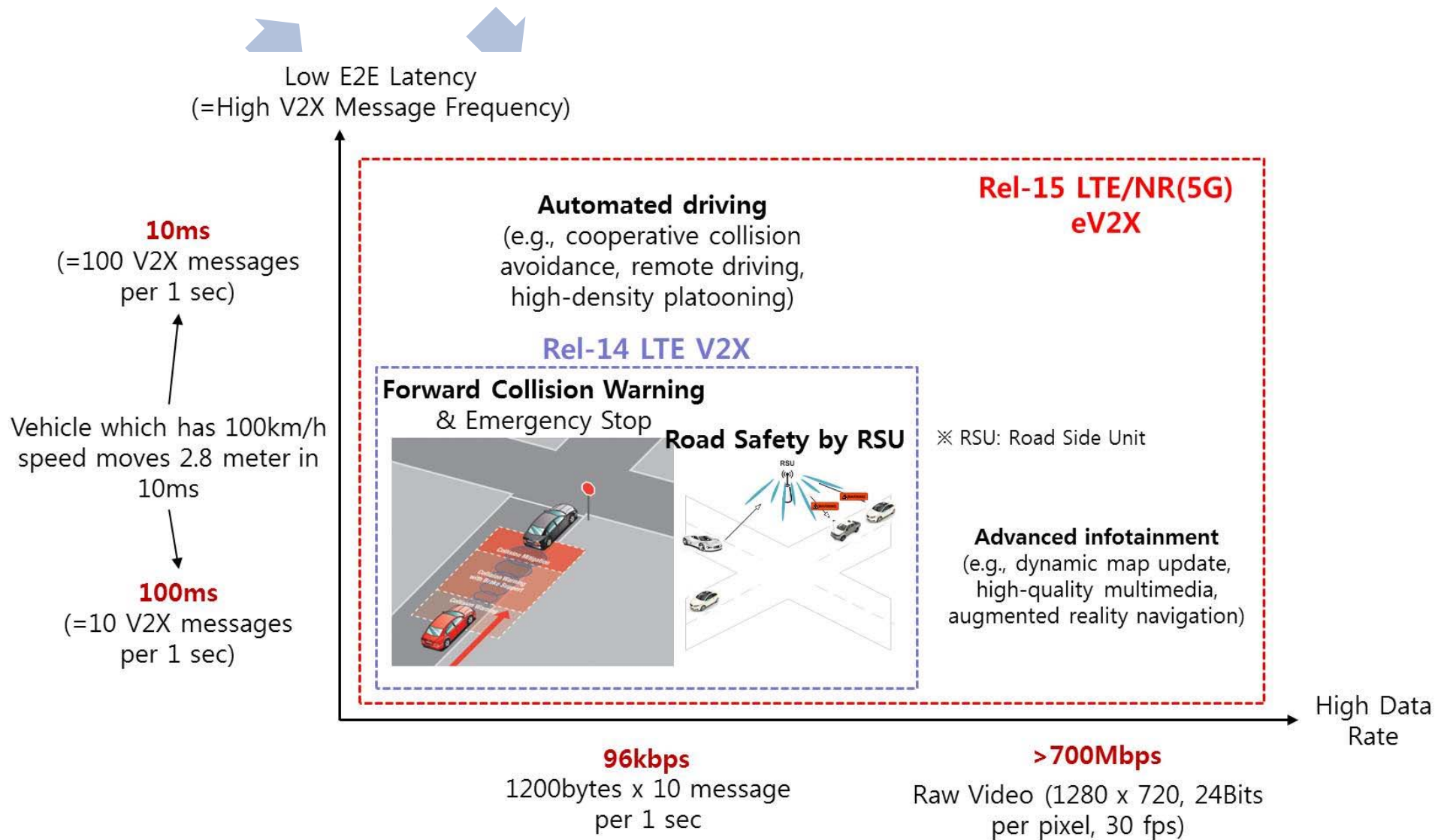


- Accurate prediction of the electricity usage => Lowering the power reserve level to save cost
- Using in the real estate planning



Technology Drivers : 5G Network

5G will be critical for delivering high-bandwidth/low-latency data.



SK Telecom's 5G autonomous driving effort with BMW

SK Telecom is working with BMW on 5G based connected car field trial, deploying its 5G network at BMW driving center demonstrating low-latency of the service.

5G pilot network



5G Control Center



Live Conference



Multiple View



360 VR



Video Recognition

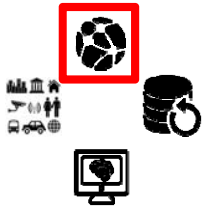


V2X Information



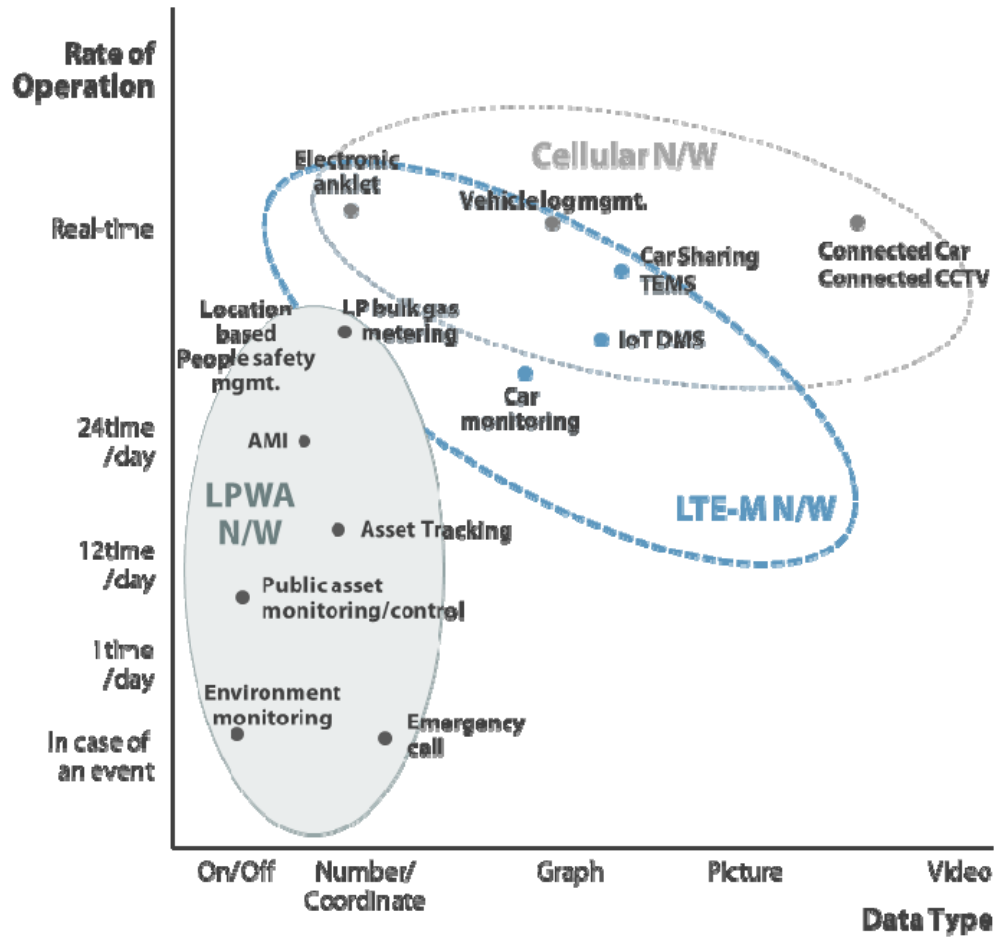
Bird-view with Drone

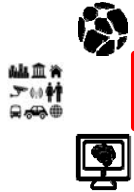




Technology Drivers : LPWA Network

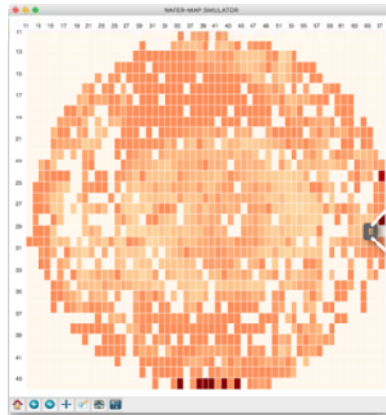
SK Telecom deployed nation-wide LoRA network in 2016.





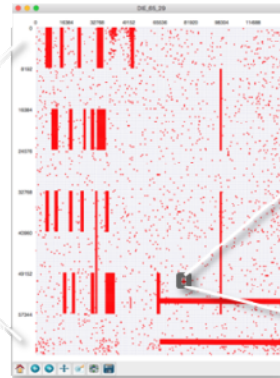
Technology Drivers : Big Data Operation

Telco's big data technology is being used for the semiconductor manufacturing.



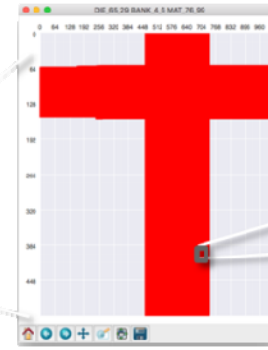
10,024,453,668,864 cells
(~10 trillion)

Wafer level



8,589,934,592 cells
(~8 billion)

Die level



524,288 cells

Mat level



Cell level

- Used to analyze the die-level data (~ 8 billion)
- Need to scale down to cell-level data (~ 10 trillion), to effectively map the manufacturing process status to actual wafer quality.



Data Ingestion

Under 10 min
(Used to be impossible)

Retrieving

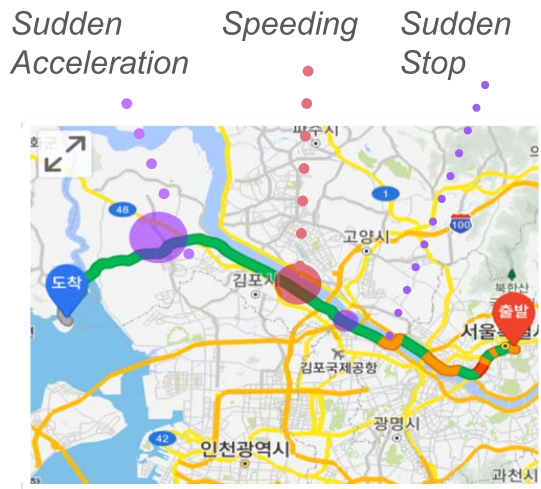
Takes under 1 sec
to drill down to cell level.



Technology Drivers : Big Data Analytics

SK Telecom's T-map navigation data is now used for the insurance industry.

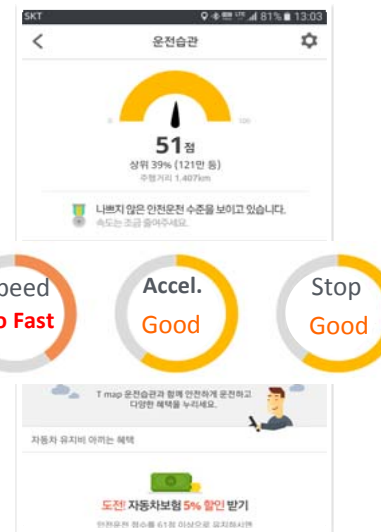
[Driving Performance per Trip]



[Driving Performance and Rating]

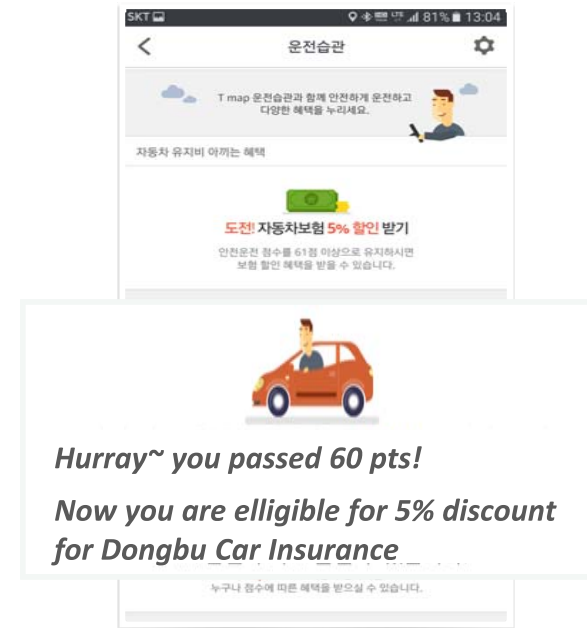


Users can check their driving performance rating on main page of T map



Users can check their driving habits in detail for each travel route

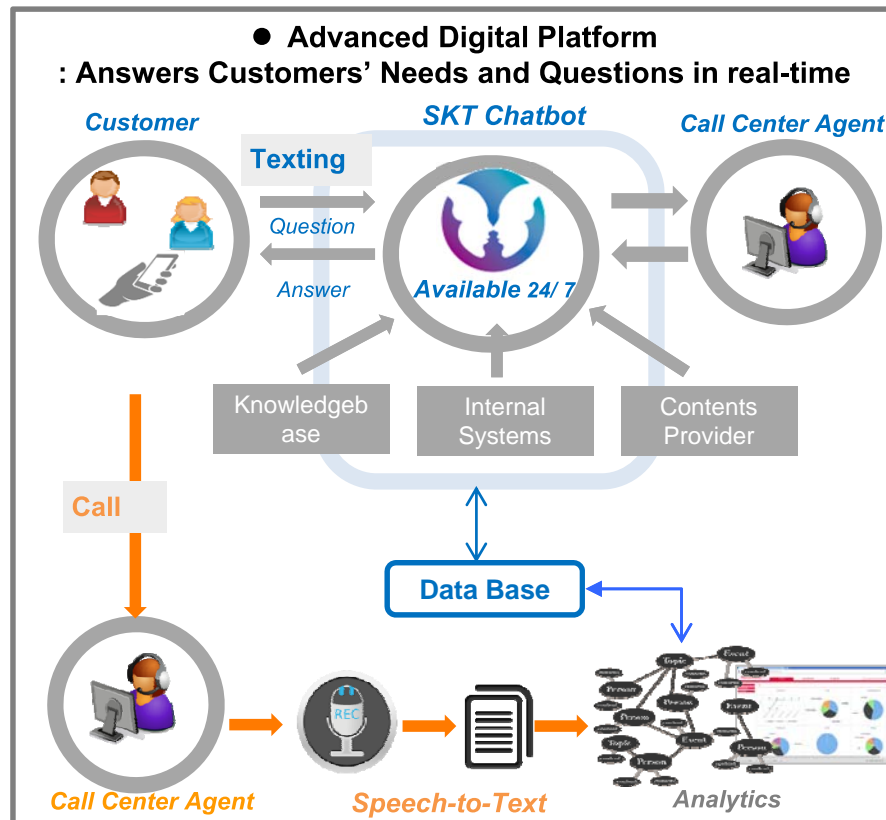
[Usage Based Insurance]





Technology Drivers : Artificial Intelligence

Own NLU / STT technology is now being used for consumers.



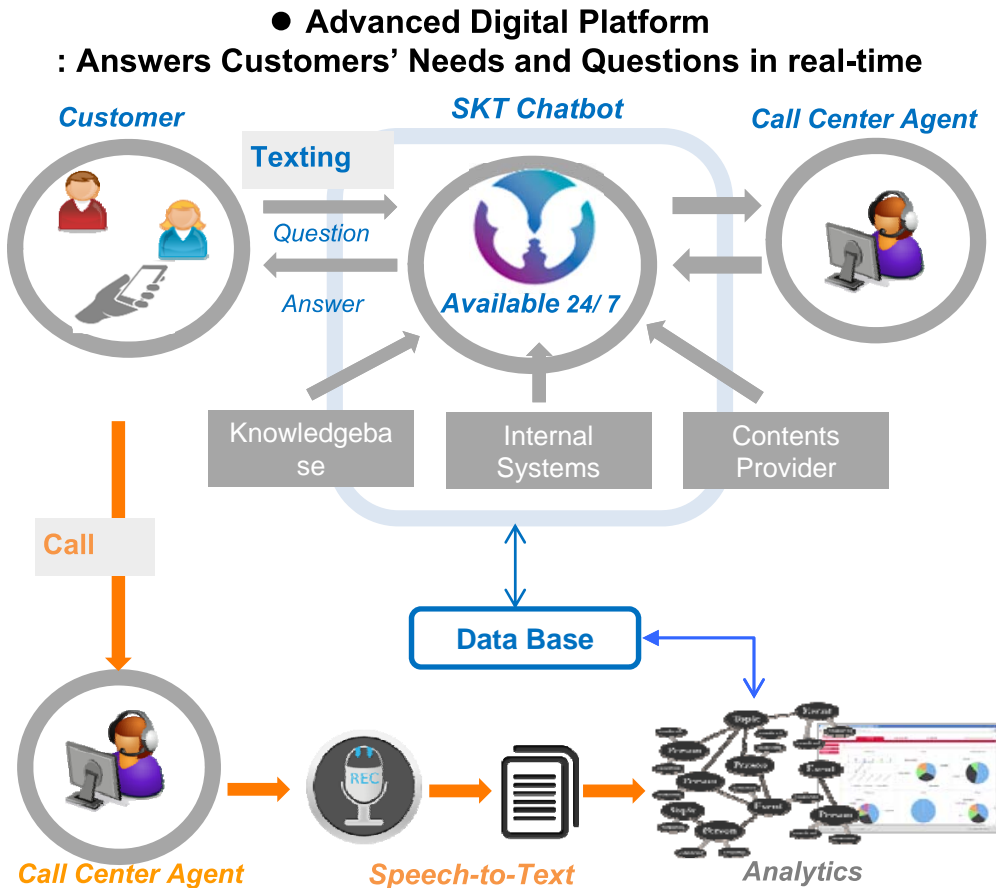
● **Chatbot, 'BARO'**

Provide Personalized Recommendation Service, 24/7 by improved natural language understanding and deep learning techniques



Technology Drivers : Artificial Intelligence

Own NLU / STT technology is now being used for consumers.



● **Chatbot, 'BARO'**

Provide Personalized Recommendation Service, 24/7 by improved natural language understanding and deep learning techniques

The block contains two images related to the BARO chatbot. On the left, two women are smiling and holding a sign that says '11번가, 챗봇 추천서비스 론칭' (11st, Chatbot Recommendation Service Launch). On the right, a screenshot of the BARO chatbot interface shows a conversation about product recommendations.



Technology Drivers : Artificial Intelligence

T-View, SKT's cloud based surveillance service is using AI at server level.



VSaaS
Platform



Video Analytics
(w/ AI)



Video Storage



Video Streaming

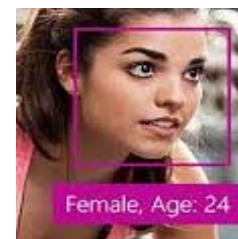
view enterprise

view partner

view sense



[Intrusion Detection]



[Age/Gender Recg.]



[Heatmap]

[Camera Tempering] [People Counting]

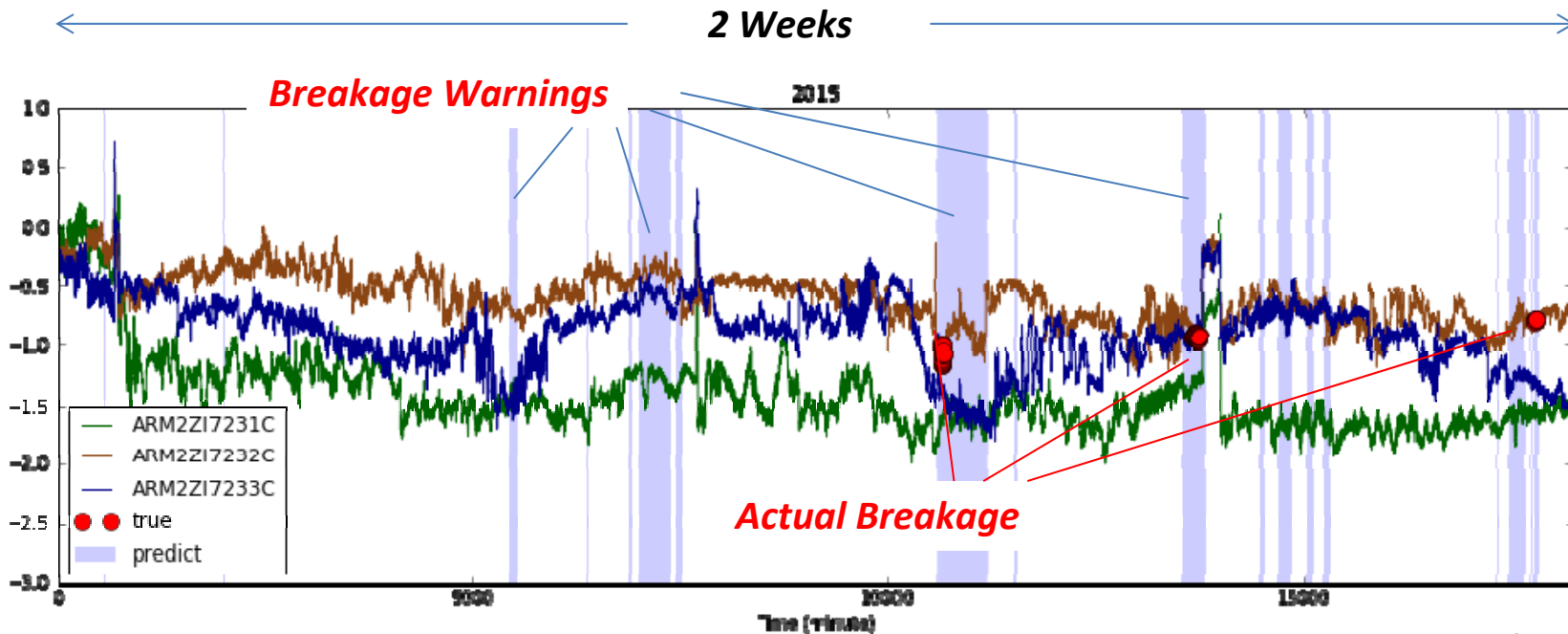




Technology Drivers : Artificial Intelligence

SKT's AI technology is now even being used for the predictive maintenance.

- Centrifugal pumps at a petroleum refinery plant
- 5 year data from 17 sensors available



Input : Two Weeks of Signals
Output : Breakage at Next Day
Machine Learning Input : 5 Year of the Data

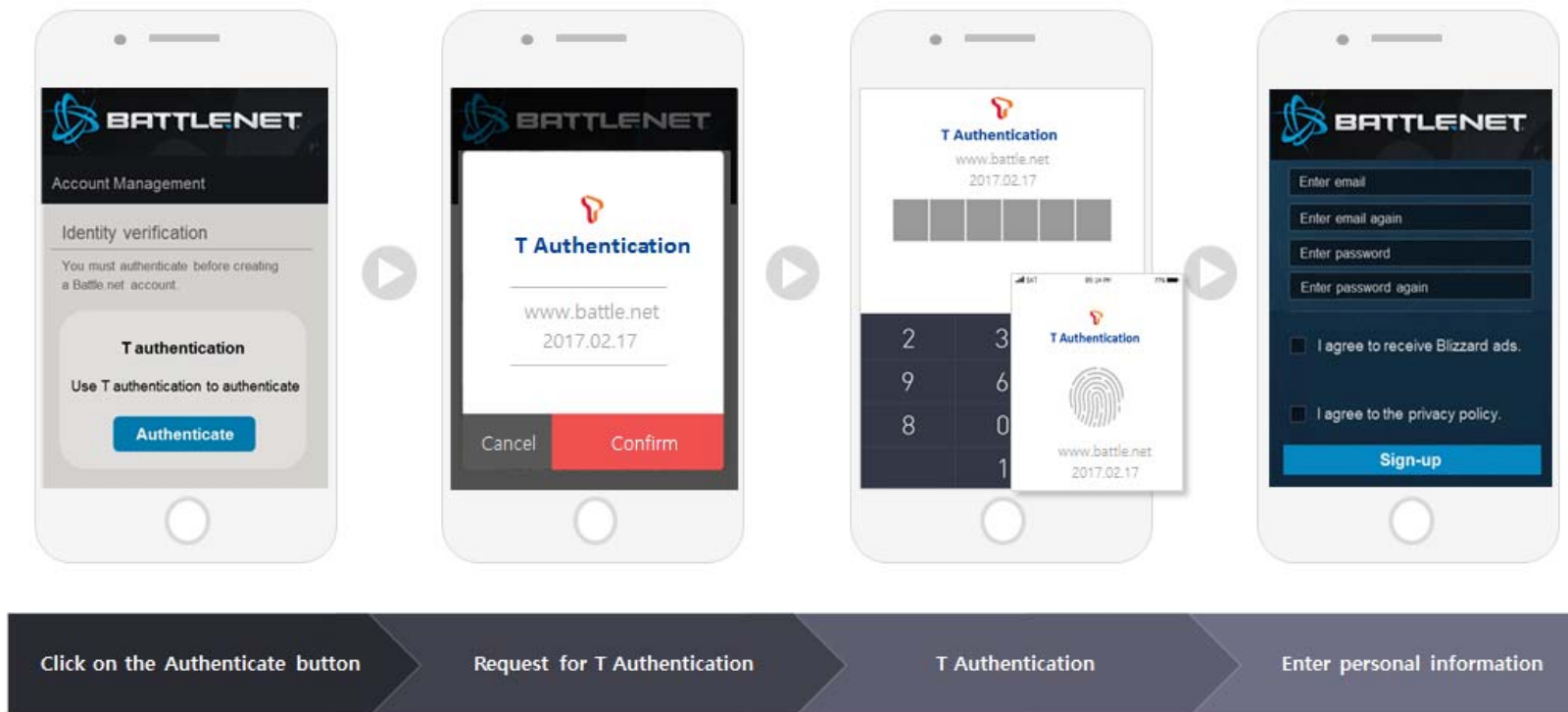
Precision: 3/23
Recall: 3/3



Technology Drivers : **Security** (Connected Things)

Telco's reliable usage data can be used for authorization of many THINGS.

- SK Telecom is handling ~ 70M authorizations per month.
- Authorization app, "T-Auth", has over 7M active users, using over 27,000 services like e-commerce.
- Easy implementation by public cloud services (e.g. Azure, AWS, etc.)



*Need to authenticate to sign-up for Battle.Net in South Korea.

Implications 1 (from Real-World Experiences)

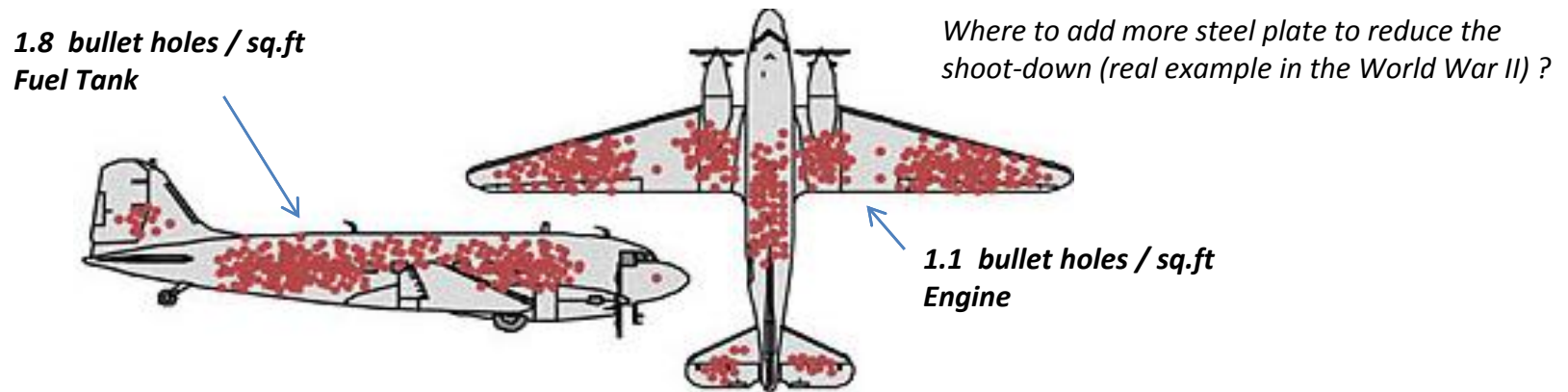
Digital Transformation by incumbent people is “REALLY DIFFICULT”



A kitchen knife cannot carve its own handle

Implications 2 (from Real-World Experiences)

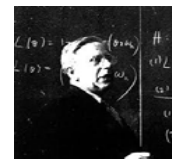
Executives need more “strategic” understanding on “Why Data?”



Trained Statisticians
& Military Generals

More bullet holes per sq.ft means
higher probability of being hit

Therefore, Fuel tank with the highest
bullet hole number needs armor.



Mathematician
(Dr. Abraham Wald)

The reason why Engine has the least
number of the bullet holes is because
the aircraft never got back from mission.

Therefore, Engine needs more armor.

Summary : Telco's Role in the Digital Transformation

Leading the Digital Transformation with IoT/Data/AI Technology

- Telco has huge assets to drive the digital transformation, both industry and society
 - Network and Data Center, enabling IoT and Cloud
 - Experience of Handling Big Data
 - Huge End-Customer Base
- Telco has limited experiences in the AI, but its still new to everybody.
 - AI algorithm itself doesn't mean anything without the big data.
 - AI algorithms will become available to public through open source.
 - Telco needs to grow the vertical expertise to define the problem.
- Telco's role is enabling SCALABLE digital transformation with above capability.
 - e.g.) Nation-wide cloud based security camera system
 - e.g.) Cloud based data analytics services for the marketing / manufacturing verticals.
 - e.g.) Country-wide genome analytics services



Thanks !