



 **IDC FutureScapes**

# The intersection of digital transformation (DX) and analytics

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# The **DX** economy

By DX economy, we mean digital transformation (DX) will attain **macroeconomic** scale and impact. It will become the **core** of what industry leaders do and how they operate.



Information is at the core of the DX economy and analytics/AI is bringing about a fundamental societal shift, one that is rapidly reinventing the world in which we live.



## Talent mastery (Worksource DX)

- ▶ Work optimization and talent sourcing
- ▶ Process, People, Culture
- ▶ KPI: Best place to work index

## Operational mastery (Operating model DX)

- ▶ Automated and agile processes
- ▶ Scale, Scope, Speed
- ▶ KPI: Critical process cycle time



## Leadership mastery (Leadership DX)

- ▶ CEO must take the DX driver seat
- ▶ Vision, Organization structure, Commitment
- ▶ KPI: Competitive share in core and new markets

## Relationship mastery (Omni-experience DX)

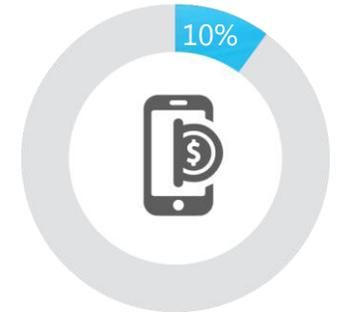
- ▶ DX is a customer-centric business strategy
- ▶ Reach, Relevancy, Reciprocity KPI:
- ▶ Net promoter score

## Information mastery (Information DX)

- ▶ Information is at the core of the DX economy
- ▶ Syntax, Semantics, Socialization
- ▶ KPI: % of revenue generated from information



By 2020, 10% of enterprise applications spending will be for new task level applications that incorporate software, data and algorithms.



The task-level applications are just emerging but their availability and adoption is expected to increase exponentially.



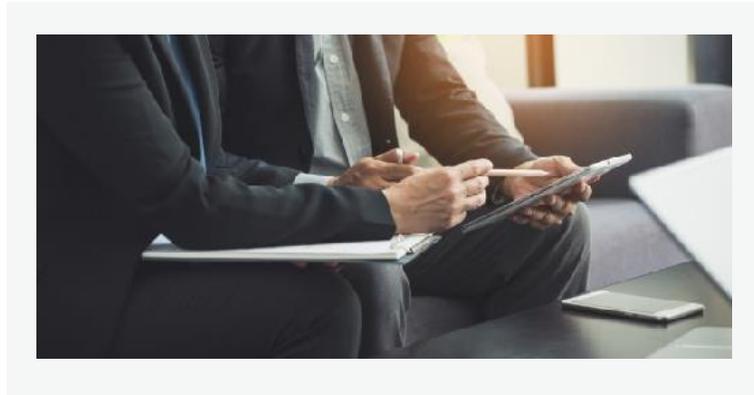
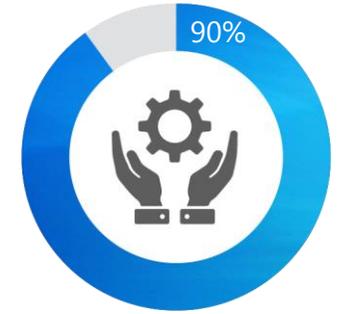
These intelligent applications incorporate software code, algorithms and data.



Data will come in the form of relevant external data, made available by the application providers that will use them to enable enterprises to augment their internal data with external data and to train machine learning algorithms.



By 2021, 90% of new intelligent systems will have an embedded decision architecture that automatically detects and evaluates conditions and makes decisions about how to respond.



A new decision-centric architecture will emerge based on the premise of comprehensive awareness, human decision maker augmentation and machine decision-making automation.



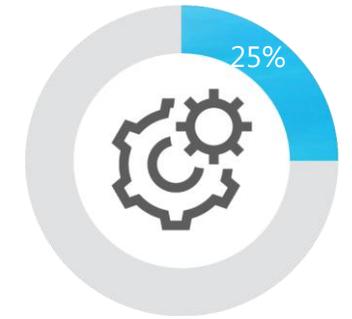
These systems become much more adaptive by utilizing ensemble learning (i.e. combining multiple (machine/deep learning models) at every step of the process.



These systems will also be constantly monitoring and detecting their own performance to adapt to new information.



By 2019, 25% of enterprises that rely on ML-based decision automation will have established governance processes to assess predictions, prescriptions and decisions against regulators, internal policy and ethical considerations using internal and external human and machine auditors.



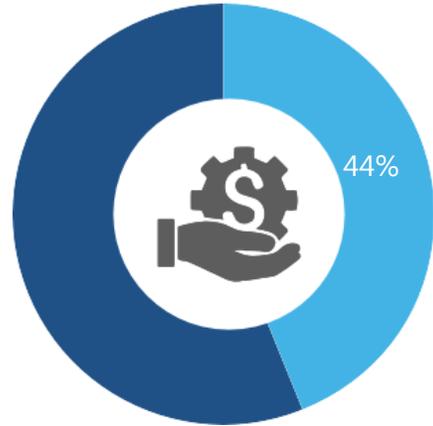
Recommendations based on machine learning may be mathematically sound but divorced from real-world constraints, they won't be operationalized. The notion that a machine can take over decision making sounds attractive but brings with it a number of risks.

- ▶ Can any given 'black box' approach, where the analytic approaches and methods used by the machine may be opaque to human recipients of the system's outputs, be trusted?
- ▶ Does the recommendation make sense in the context of constraints such as regulation or internal policies? Are machine learning routines resulting in biased recommendations?

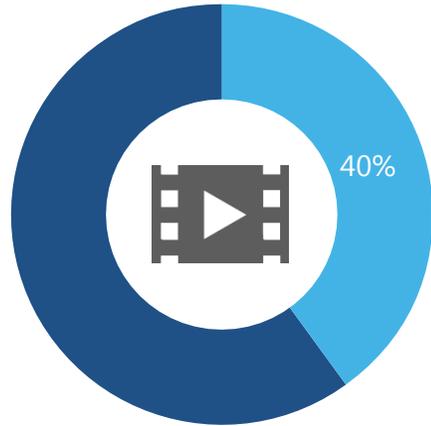
# The information DX maturity

Among the surveyed organizations, those in financial services, manufacturing, communications, and media are the most matured in information DX.

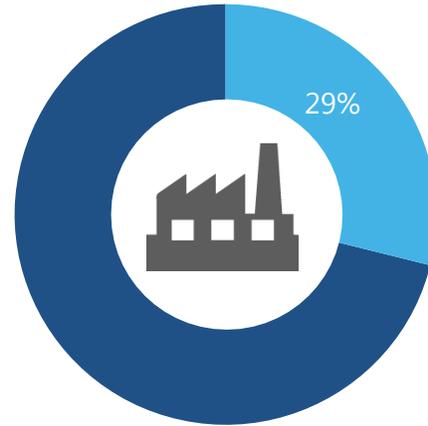
Which of the following information DX stage are you at currently?



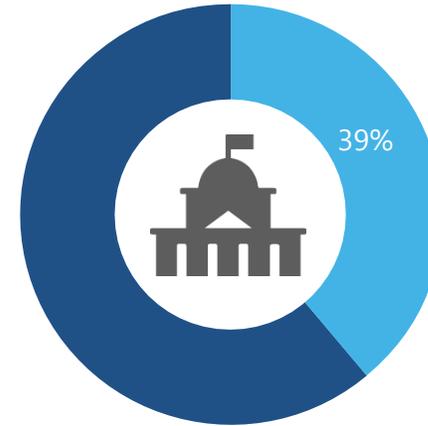
Financial services



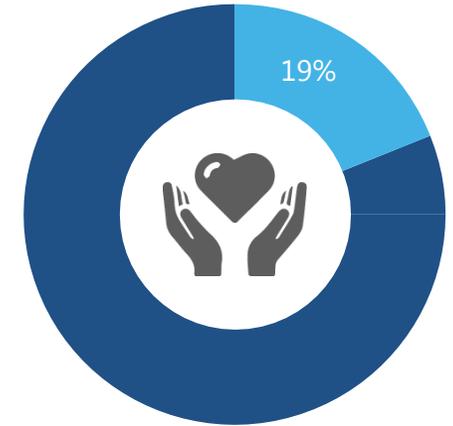
Communications and media



Manufacturing



Public sector



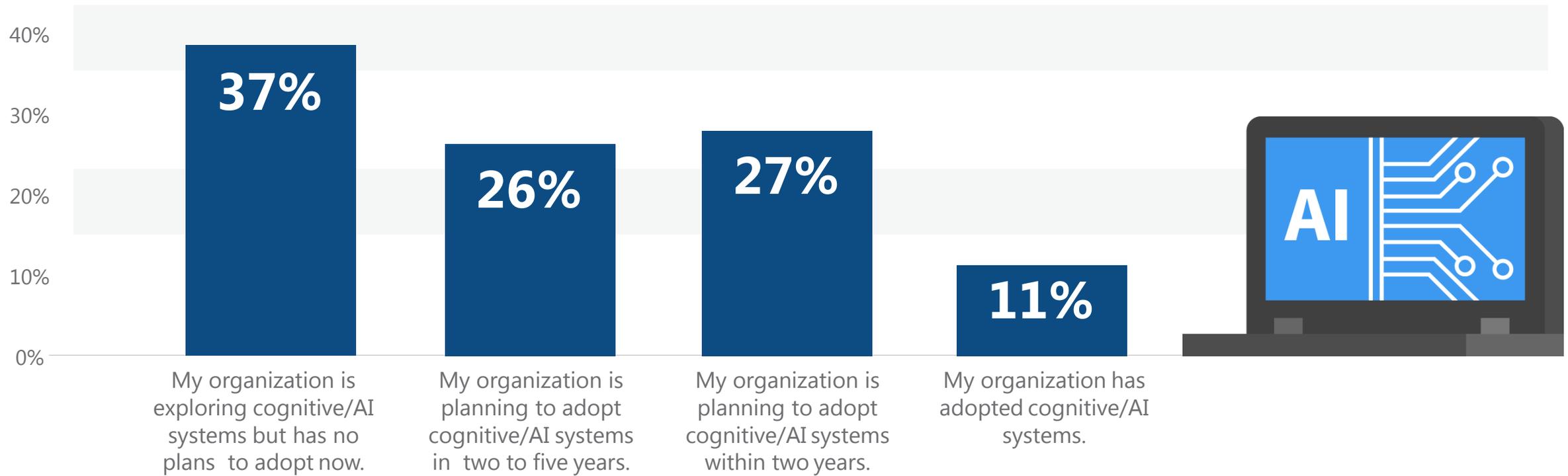
Healthcare and life science

■ In the top 3 stages ■ In the earlier stages

# The adoption of AI/cognitive systems

Around 11% of organizations in Asia/Pacific have adopted AI solutions, trailing behind the 38% of the United States. The Asia/Pacific rate is on par with that of Western Europe countries. With around 53% planning to adopt within the next five years, growth is expected to accelerate rapidly.

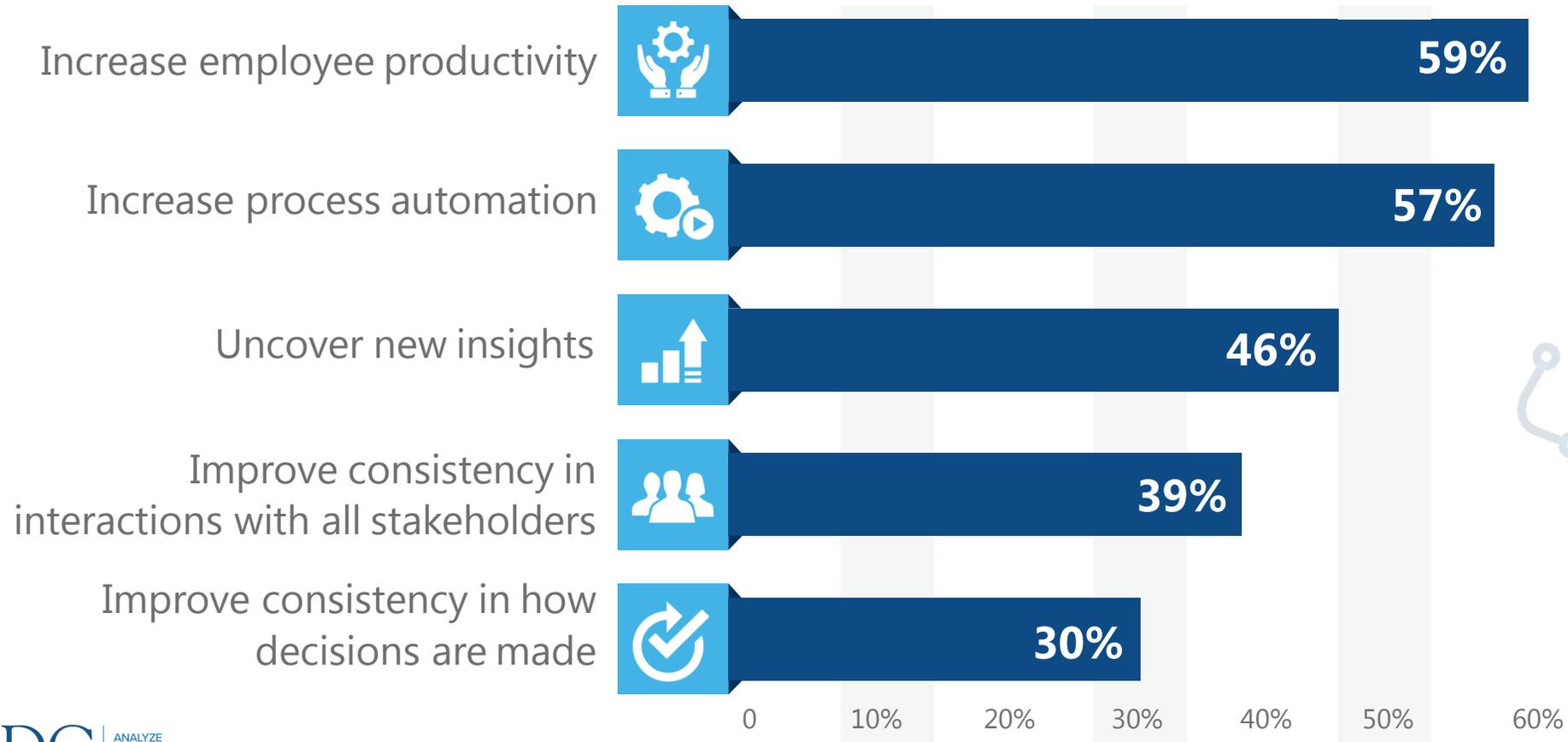
**Which of the following best reflects your organization's status regarding cognitive/AI systems?**



# The benefits of AI/cognitive solutions

Increased employee productivity and increased process automation are the most common expectations among organizations adopting or planning to adopt cognitive/AI solutions.

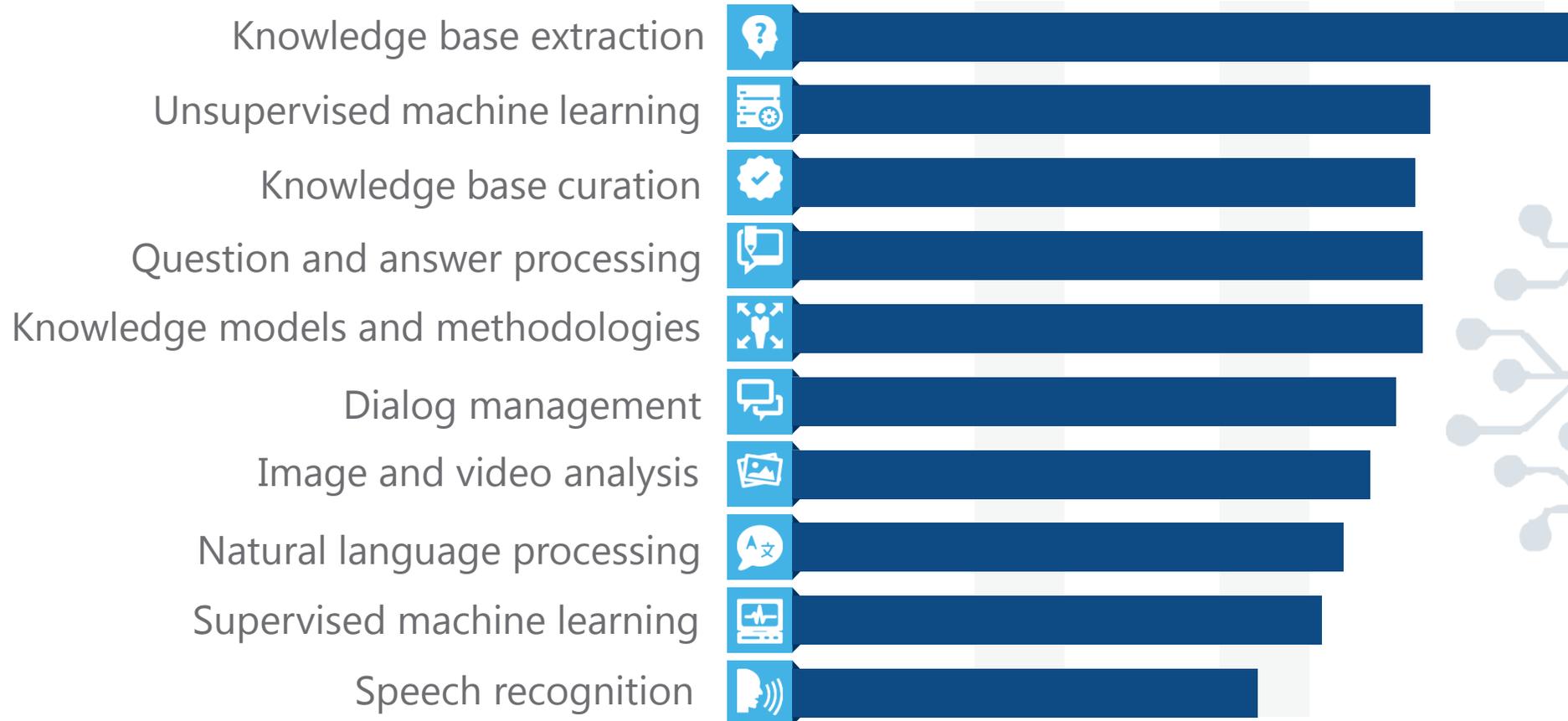
## What are the primary expected benefits of your organization's cognitive/AI solution?



# Leading AI/cognitive functionalities in demand

The most used functionalities in cognitive/AI solutions in Asia/Pacific.

**When thinking about your organization's cognitive/AI solution(s), which of the following functionalities are part of such a solution?**



# Delivering results with real-time edge analytics

## Retail



Real-time personalized customer insights for staff to create frictionless in-store experience.



Risk management to lower losses due to shrink (theft/fraud).



Predict consumers in-market readiness for a purchase by combining spending insights credit card or loyalty programs (first-party customer data).



Help marketers increase effectiveness by engaging consumers with relevant offers when they are most ready to buy.



# The intersection of DX and analytics in retail

Source: Alibaba 11.11 Virtual Reality Shopping

双十一 VR 购物产品 BUY+ 产品测试记录

No.2016100807

# Delivering results with real-time edge analytics

## Manufacturing



**Micron runs foundries with big data and machine learning.**



Collect various data in wafer foundries.



- ▶ Optimize performances in quality, yield rate, output, production cycle and operating cost.
- ▶ Shift wafer management task from manual work to automation and centralize foundry management to remote operations center.
- ▶ Integrated distributed systems into a holistic solution and starts to make decisions and overcome challenges through data analytics.



For quality, Micron's Remote Operations Center deploys mechanisms, such as sensor based fault detection, predictive maintenance, real time process control and predictive analytics, in foundries to enhance operational efficiency by **35%**.

# Delivering results with real-time edge analytics

## Oil, gas and solar



### Digital oil field

- ▶ Modernizing legacy technologies with edge-enabled oilfield devices can improve the efficiency and profitability of production operations, from surface equipment to the back office.
- ▶ Greater efficiencies across the upstream oil and gas sector.

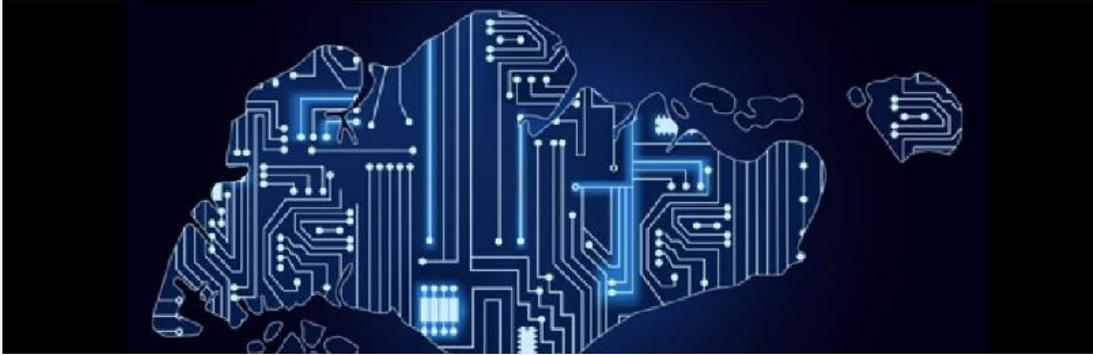


### Solar

- ▶ Make smart electric grids more efficient in delivering energy, can predict when batteries and other equipment will fail (e.g. dust on panels) as well as help make energy exploration easier and more economical.

# Delivering results with real-time edge analytics

## Electricity



**World Economic Forum: The complete digital transformation of the electricity industry could unlock \$1.3 trillion of value through.**

- ▶ Service platforms
- ▶ Smart meters
- ▶ Cloud
- ▶ Advanced analytics and machine learning



### Smart meters

- ▶ Provide security for householder data.
- ▶ Govt policies enabling IoT analytics (e.g. SG Govt).

# Delivering results with machine learning

## Financial services



### Trading strategy by using the Capital Asset Pricing Model (CAPM) and cost-of-carry relationship.

- ▶ Deep learning used to generate buy and sell signals for each stock and for portfolios of stocks.
- ▶ The performance of the trading strategies is then calculated and compared.
- ▶ Overall performance of the artificial intelligence strategies is far better than the traditional ones.

### Corporate bankruptcy predictions using “new age” classifiers and models.

- ▶ Use of neural networks, support vector machines (SVMs) and “new age” statistical learning models.

The “new age” classifiers in corporate bankruptcy modelling are recommended:

- Predict significantly better than all other classifiers on both the cross-sectional and longitudinal test samples.
- Considerable practical appeal because they are relatively easy to estimate and implement.
- Good level of interpretability through such.



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