# THE FUTURE VISION of 2020

## SHAPING THE NEXT WAVE OF MARINE TIME DIGITAL TRANSFORMATION


PRESENTED BY

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CO-FOUNDER

IPO SG

# DIGITALIZATION

- WHAT IS DIGITALIZATION?
- WHAT DOES IT MEAN FOR MY ORGANIZATION?
- WHAT ARE BEST PRACTICE EXAMPLES APPLIED TO MARITIME INDUSTRIES?
- HOW CAN AI BE USED IN LOGISTICS TO REINVENT BACK OFFICE, OPERATIONAL, AND CUSTOMER-FACING ACTIVITIES?

# Digital Future for Maritime

# FUTURE PORT

**The Tuas mega port, slated to open in phases from 2021, will incorporate smart and green technologies into its operations. Some of these will be tested at the MPA Living Lab. The Straits Times looks at the journey of a container through the port of the future.**

**Drones**
- Drones can be used to fulfil the shore-ship deliveries.
- They can also be sent in to inspect vessels for damage, among other checks.

**Automated technology**
- Quay cranes, yard cranes and guided vehicles will be automated.
- Automated loading/unloading operations.
- Computers, sensors and cameras ensure the safe and precise handling of containers.
- 50% of wharf operation supervisors and up to 80% of yard crane operators and prime mover drivers will be retrained for higher-skilled roles.

**Green technology**
- The cranes and automated guided vehicles will be fully electric.
- Solar energy will be harvested and waste heat recovered from building cooling systems.

**Floating platforms**
- Currently, if a berth is not available, the vessel waits at anchorage in the sea.
- The Maritime and Port Authority of Singapore (MPA) is now exploring the use of multi-purpose floating platforms so that while waiting, immigration checks, refuelling and top-up of supplies can be done. More ships moored to the platforms will free up space at sea.

Delivery

Inspection

**Tracking arriving vessels**
- Today, a captain of a vessel entering the Singapore port has to alert MPA of its arrival at least 24 hours ahead by e-mail, fax or telex (not standardised and digitised).
- In future, the information will be conveyed digitally.
- A new Vessel Traffic Management System will use cloud computing, data analytics, smart algorithms, sensors and advanced communication systems to manage and track the vessels. Voice communication will be minimal.

**Single sharing portal**
- Currently, the captain has to submit documents to MPA, Immigration and Checkpoints Authority and National Environment Agency separately – MPA for vessel clearance, ICA for crew/passenger clearance and NEA for health clearance.
- In future, this will be done through a single government portal.

Vessel arriving...

**Just-In-Time Arrival System**
- When the vessel enters the Singapore Strait, the captain now reports verbally by VHF radio to MPA and radios PSA Marine to arrange for a marine pilot who will guide the vessel through Singapore waters.
- In future, the Just-In-Time Arrival system will take over the coordination. This will cut delays and waiting times of calling vessels and optimise port services and resource deployment.

## COMPARISON OF AUTOMATED TERMINAL OPERATIONS

**Tuas Terminal**
- Trans-shipment port that is many times larger than the ones in Europe.
- More complex to automate a trans-shipment container terminal of this scale than a destination port.

**Capacity (million TEUs):**

The port will occupy 1,339ha of land – about the size of two Ang Mo Kio New Towns

Amount of land to be reclaimed 1,085ha

First set of berths ready by 2021

## TUAS TERMINAL FACTS AND FIGURES

| Phase | Area (ha) | Start of operations | Cargo handling capacity (TEUs, million)* |
|---|---|---|---|
| 1 | 414 | Early 2020s | 20 |
| 2 | 405 | Late 2020s | 21 |
| 3 | 260 | Early 2030s | 11 |
| 4 | 260 | Mid-2030s | 13 |

NOTE. *Twenty-foot equivalent units. Refers to a common international standardised 20-foot-long (6.1m) container type.

**$1 billion**
Approximate cost savings in reclamation fill material by re-using dredged and excavated materials from land construction projects such as rail infrastructure projects, for reclamation of Tuas Phase 1.

Feasibility studies are being done on the construction of an elevated area 42m above ground – overlooking port operations – to house warehousing, distribution and logistics operations, as well as possibly cafes, retail stores and other amenities.

**2,300 out of 2,800 coral colonies**
around Sultan Shoal lighthouse – in the vicinity of the proposed reclamation works – have been relocated to the Southern Islands successfully.

**$6 million**
Cost of the coral relocation project

Private & Confidential

# Future of Next Generation Solution

**1st Industrial Revolution**
18th Century

Steam-based Machines

**2nd Industrial Revolution**
19th~20th Century

Electrical Energy-based Mass Production

**3rd Industrial Revolution**
(1st Information Revolution)
Late 20th Century

Computer and Internet-based Knowledge

**4th Industrial Revolution**
(2nd Information Revolution)
Early 21st Century~

**Artificial Intelligence Information Technology**

Intelligence
A.I. SW

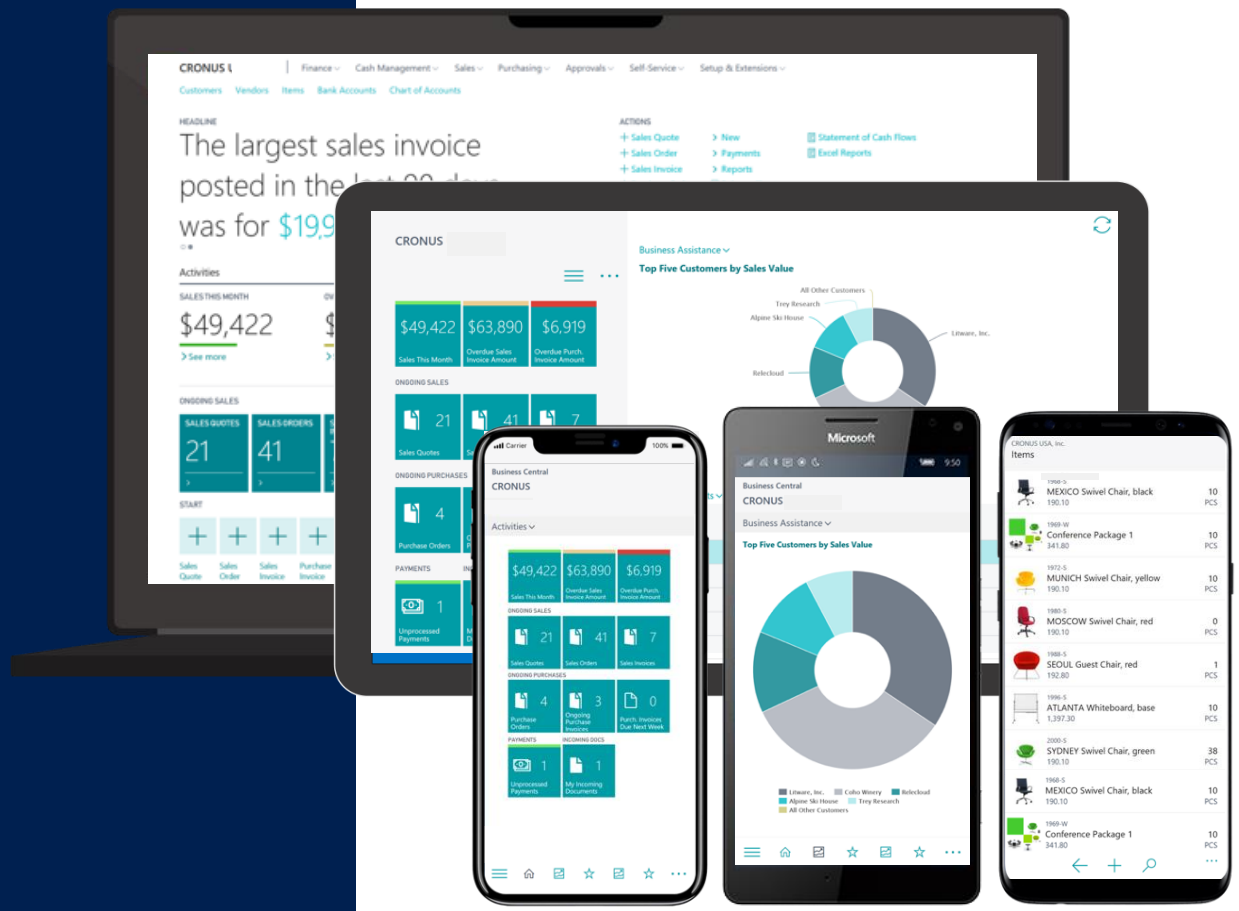
+

Information
Big Data
IoT
Cloud

# Microsoft Wave of Digitalization

## Microsoft Digitalization Wave

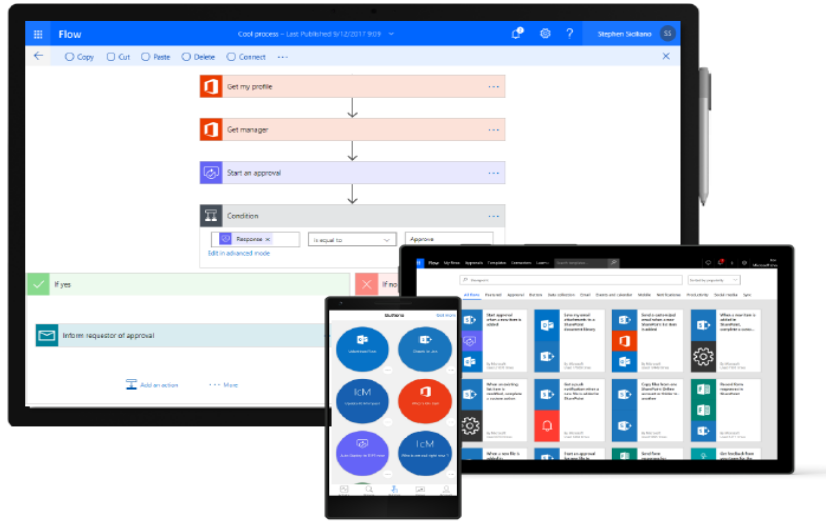
- Business Central
- Flow
- Power App
- Power BI



# Microsoft Flow

## Automate and integrate business processes with Microsoft Flow

- Automate and model business processes across your apps and services
- From simple automations to advanced scenarios with branches, loops, and more
- Trigger actions, grant approvals, and get notifications right where you work




Enterprise-grade

Cloud and on-premises connectivity

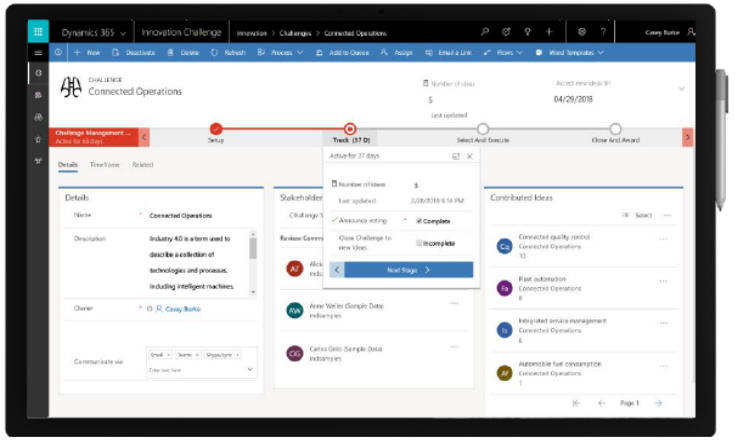
Pro-developer extensibility

# Microsoft Wave of Digitalization

## Power App

### Put all your data to work with Common Data Service for Apps

- Jumpstart apps using a standardized data model with business logic, security and integration built-in
- Extend to your own needs and integrate across your apps and services
- Seamless Dynamics 365, Office 365, and Azure integration, augmented with data from industry partners




Enterprise-grade

Cloud and on-premises connectivity

Pro-developer extensibility

IPO

Microsoft Partner

# Microsoft Wave of Digitalization

## Power BI

### Gain insights from your data regardless of where it lives with Power BI

- Connect to all your data and get a consolidated view across your business through a single pane of glass
- Create ad-hoc analysis, live dashboards and interactive reports that are easy to consume on the web and across mobile devices
- Build smart apps by infusing insights from your data and drive action with the power of the Business Application Platform

Enterprise-grade

Cloud and on-premises connectivity

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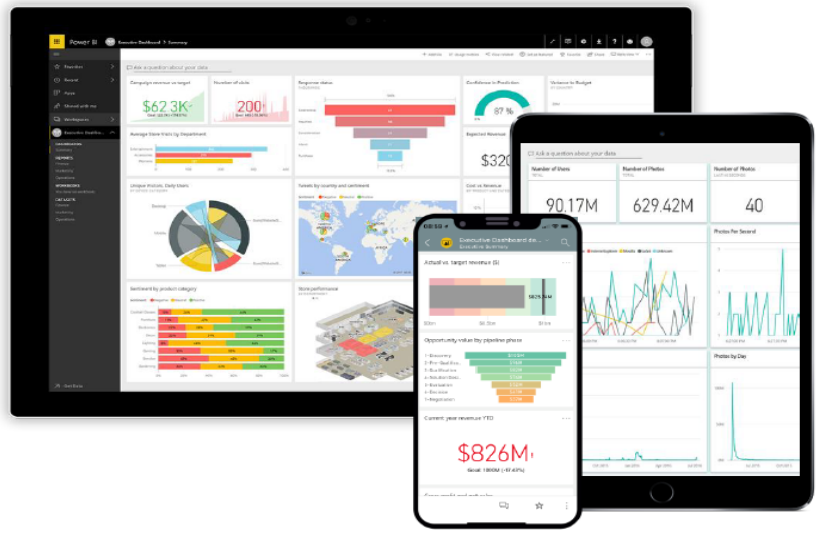



Enterprise-grade

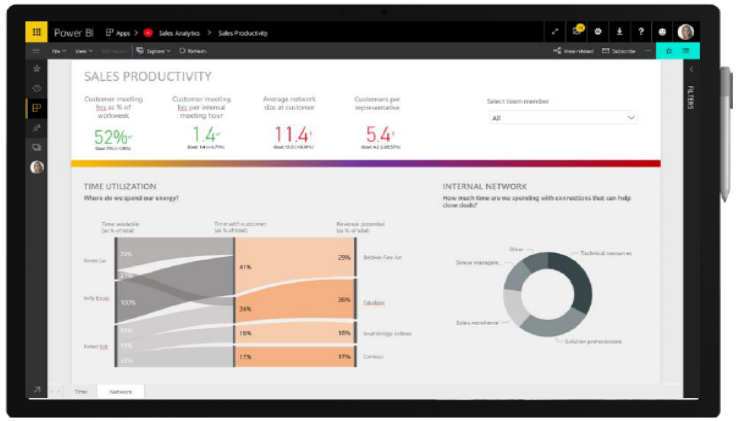
Cloud and on-premises connectivity

Pro-developer extensibility

# Power BI - AI

## Accelerate insights with Common Data Service for Analytics capability in Power BI

- Unify data and drive analytics with a standardized schema built on the common data model
- Benefit from out-of-the-box insights that are extensible to meet your unique business needs
- Integrate data warehousing processes with business analytics in Power BI and easily extend to Azure




Enterprise-grade

Cloud and on-premises connectivity

Pro-developer extensibility

# Digital Transformation - Power

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# What is AI? – To sense, comprehend and act

## Sense

Computer vision and audio processing, for example are able to actively perceive the world around them by acquiring and processing images, sounds and speech. The use of facial recognition at border control kiosks is one practical example of how it can improve productivity.

## Comprehend

Natural language processing and inference engines can enable AI systems to analyse and understand the information collected. This technology is used to power the language translation feature of search engine results

## Act

An AI system can take action through technologies such as expert systems and inference engines or undertake actions in the physical world. Auto-pilot features and assisted-braking capabilities in cars are examples of this

**AI Technologies**

### Emerging AI technologies

- Computer Vision
- Audio Processing
- Natural Language Processing
- Knowledge Representation
- Machine Learning
- Expert Systems

**Illustrative Solutions**

Virtual Agents

Identity Analytics

Cognitive Robotics

Speech Analytics

Recommendation Systems

Data Visualization

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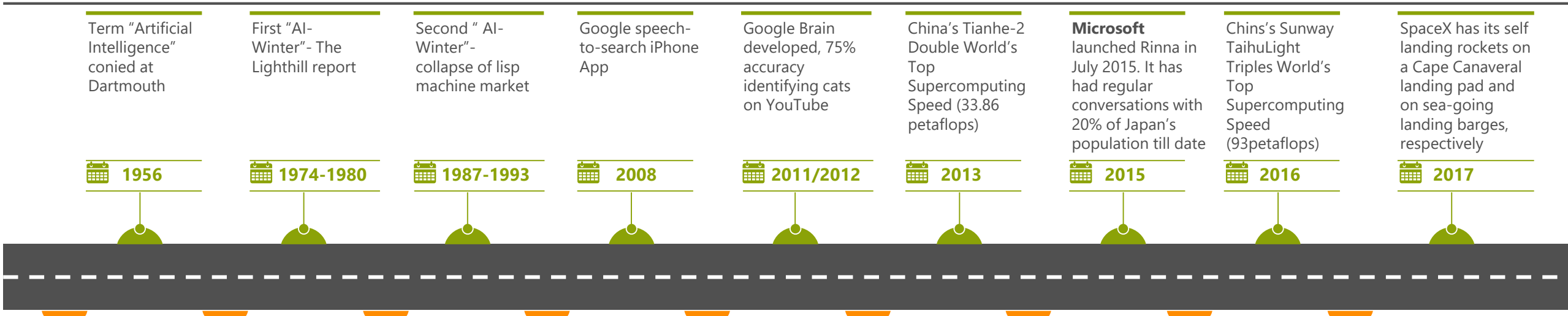
# The RISE of AI (PART 1)

## Evolution of AI:1950-present

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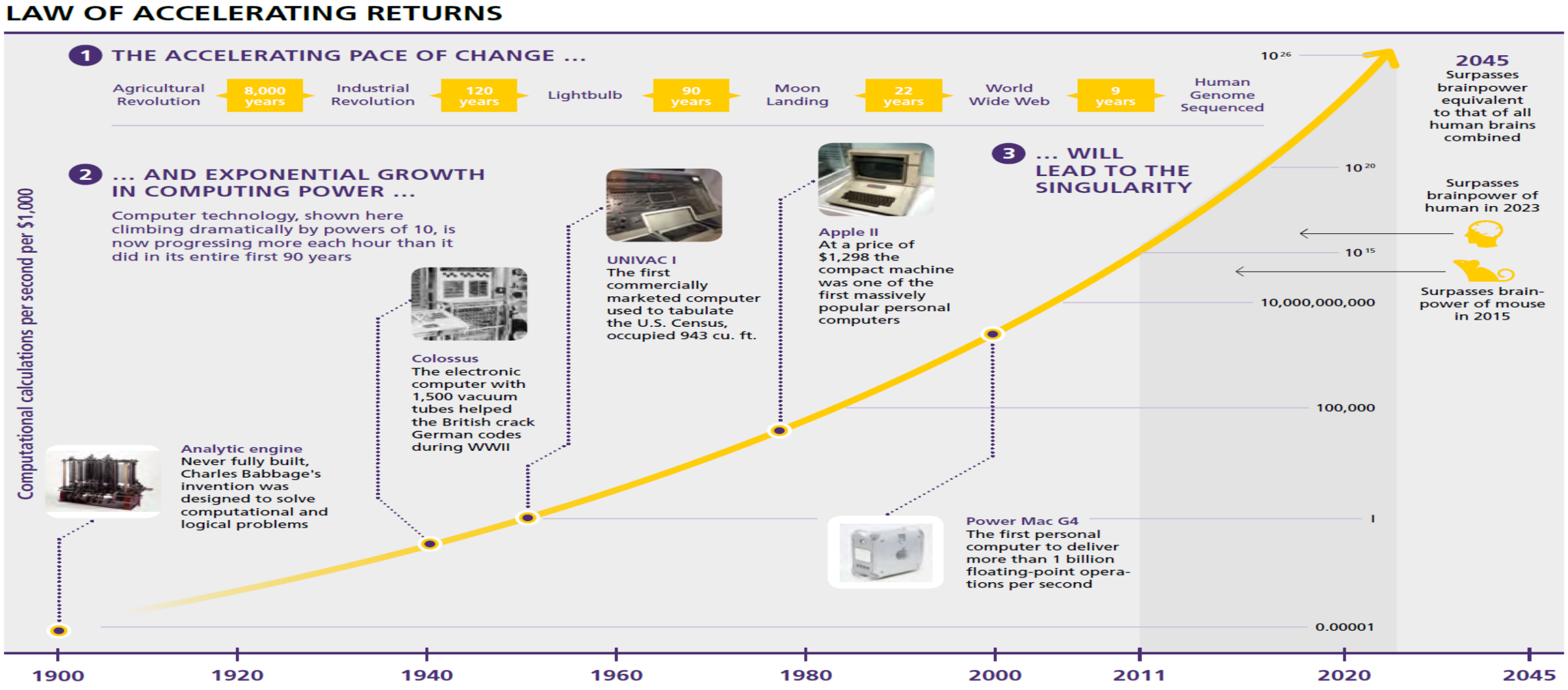
# Law of Accelerating Returns

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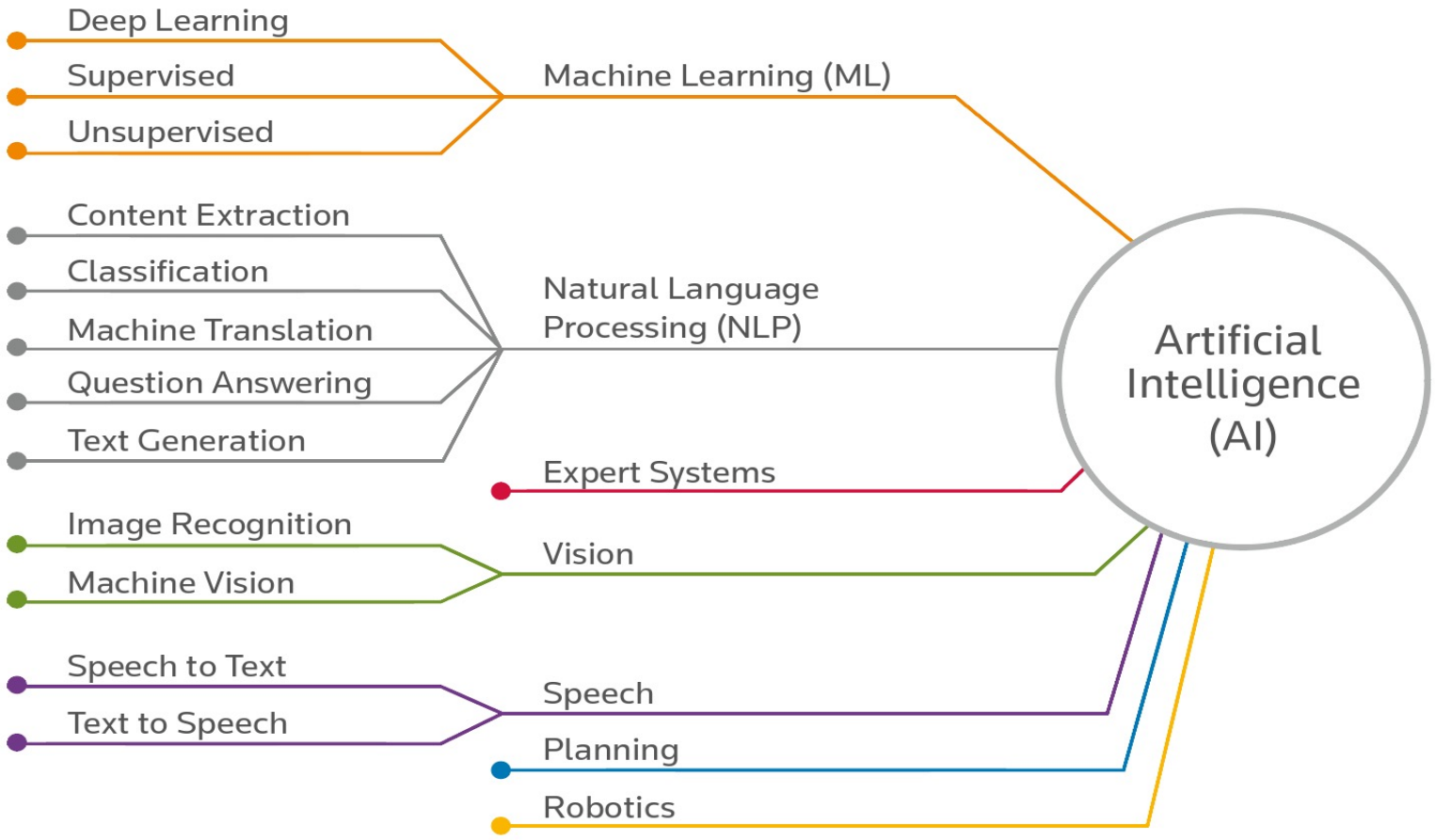
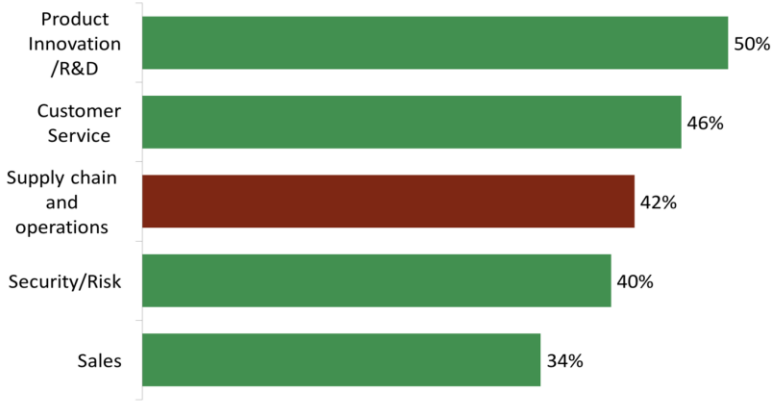
# Artificial Intelligence Approach




**Top Areas Where Businesses Are Driving Revenue From AI Investments**

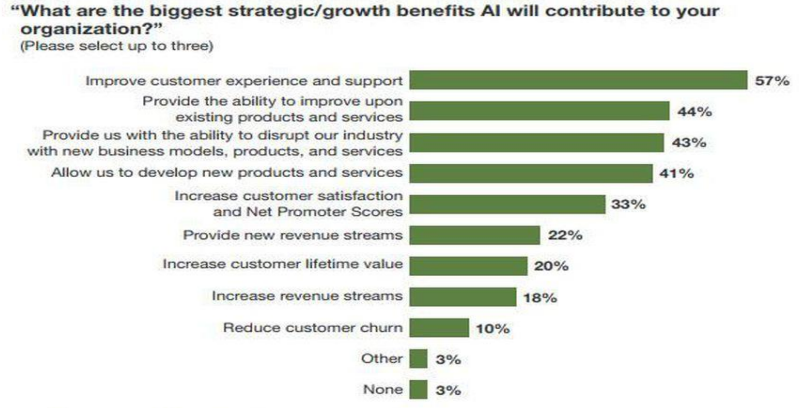
*Q: Which part of your organization is driving revenue from AI capabilities today?*




*Source: Teradata, Vason Bourne, 2017, n=209 IT and business execs*

BI INTELLIGENCE

**FIGURE 2** Enterprises Believe The Benefits Of AI Will Be To Improve Customer Experience And Support




Base: 598 business and technology professionals
Source: Forrester's Q2 2016 Global State Of Artificial Intelligence Online Survey

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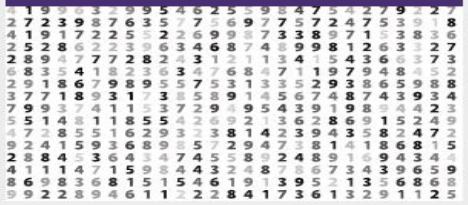
# The RISE of AI (Part 3)

## DEEP LEARNING IN ACTION

**1980s**



Scanned Digits

**2012**

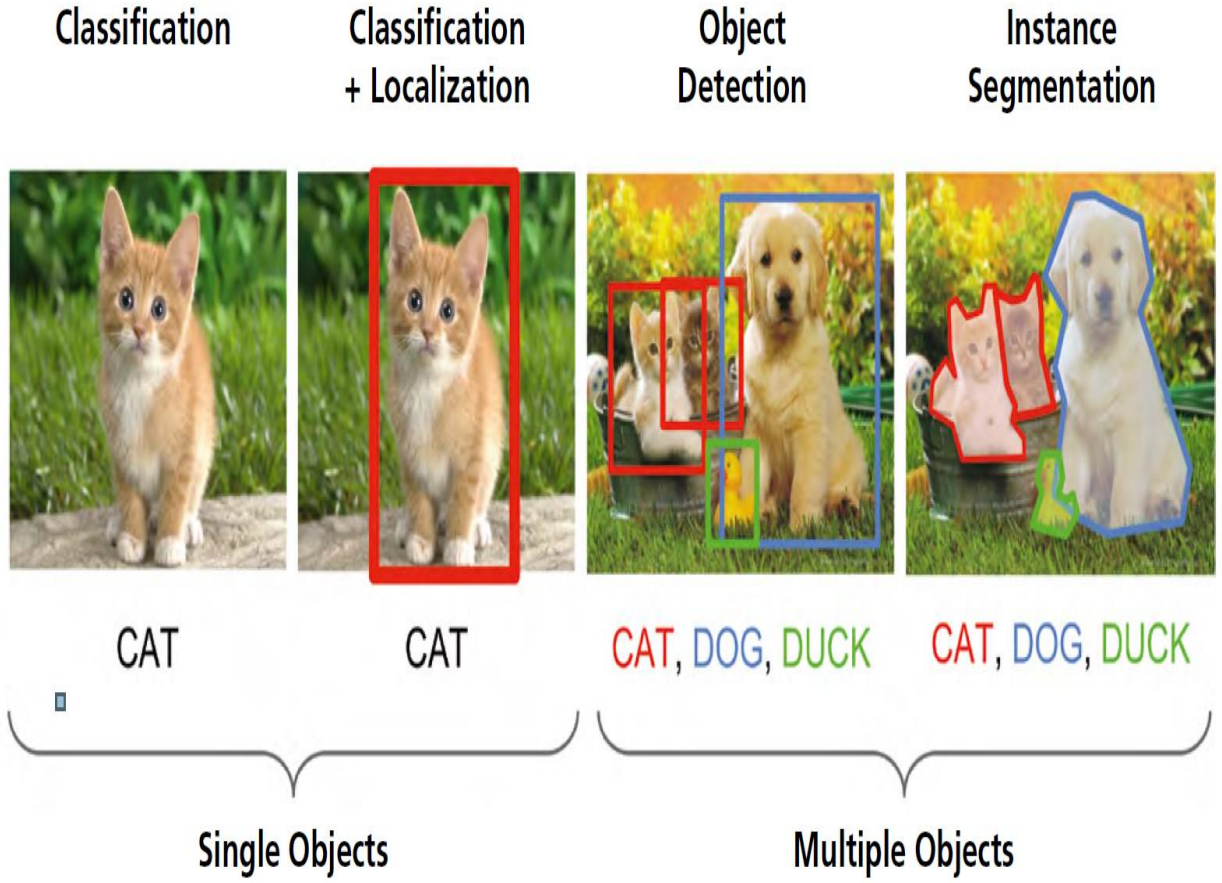
Natural Photos

**TODAY**

A woman is throwing a frisbee in a park

Vision & Language Scene Recognition

The computer understands the picture and sees that 'a woman is throwing a frisbee in a park'

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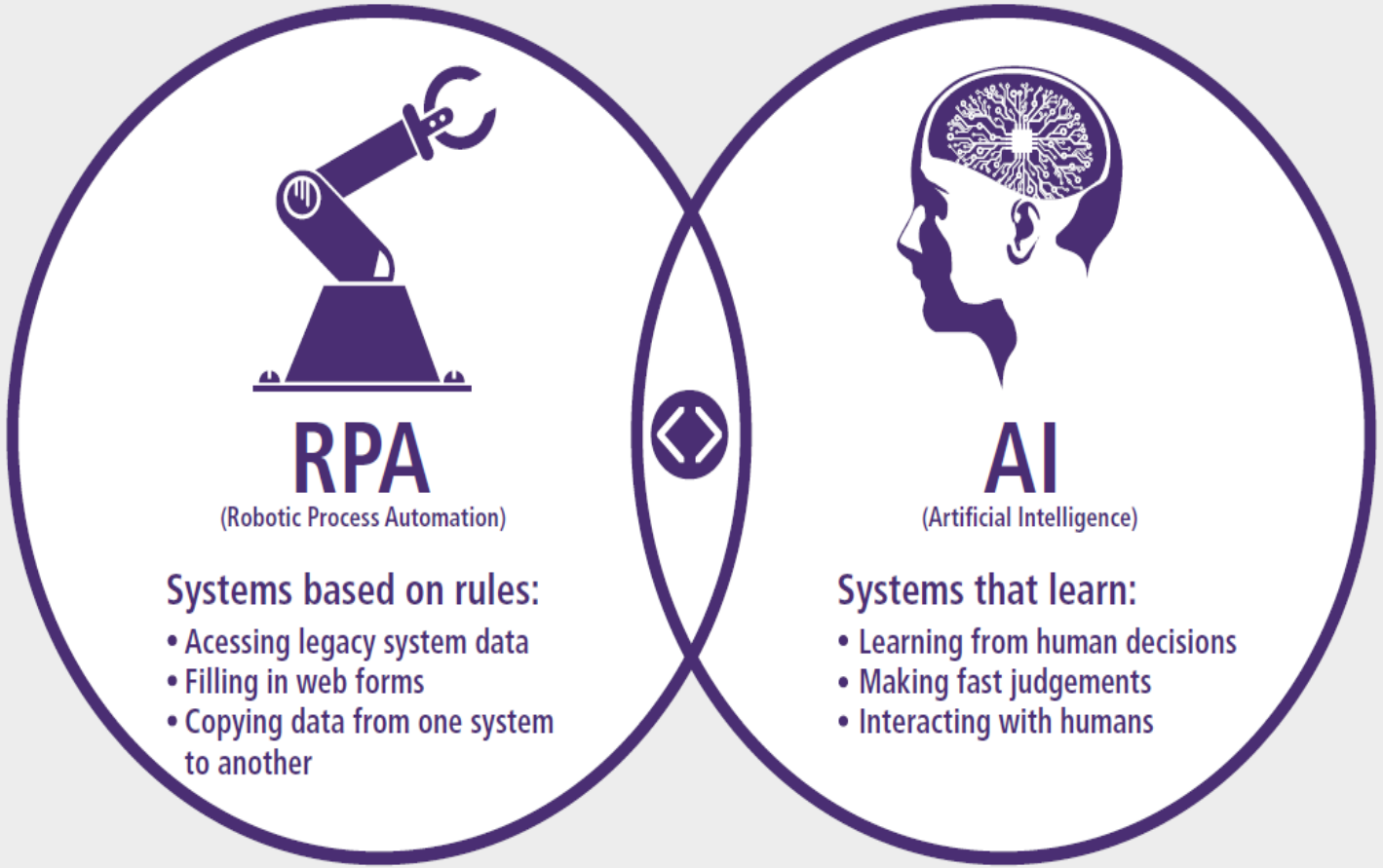
# Microsoft Vision of 2020

- Build 2017: Workplace Safety Demonstration
- Vision 2020 of Microsoft in Maritime

# Maritime AI

## RPA AND AI: THE BRAWN AND BRAINS OF PROCESS AUTOMATION

### Integration to your Suppliers and Customers Supply Chain

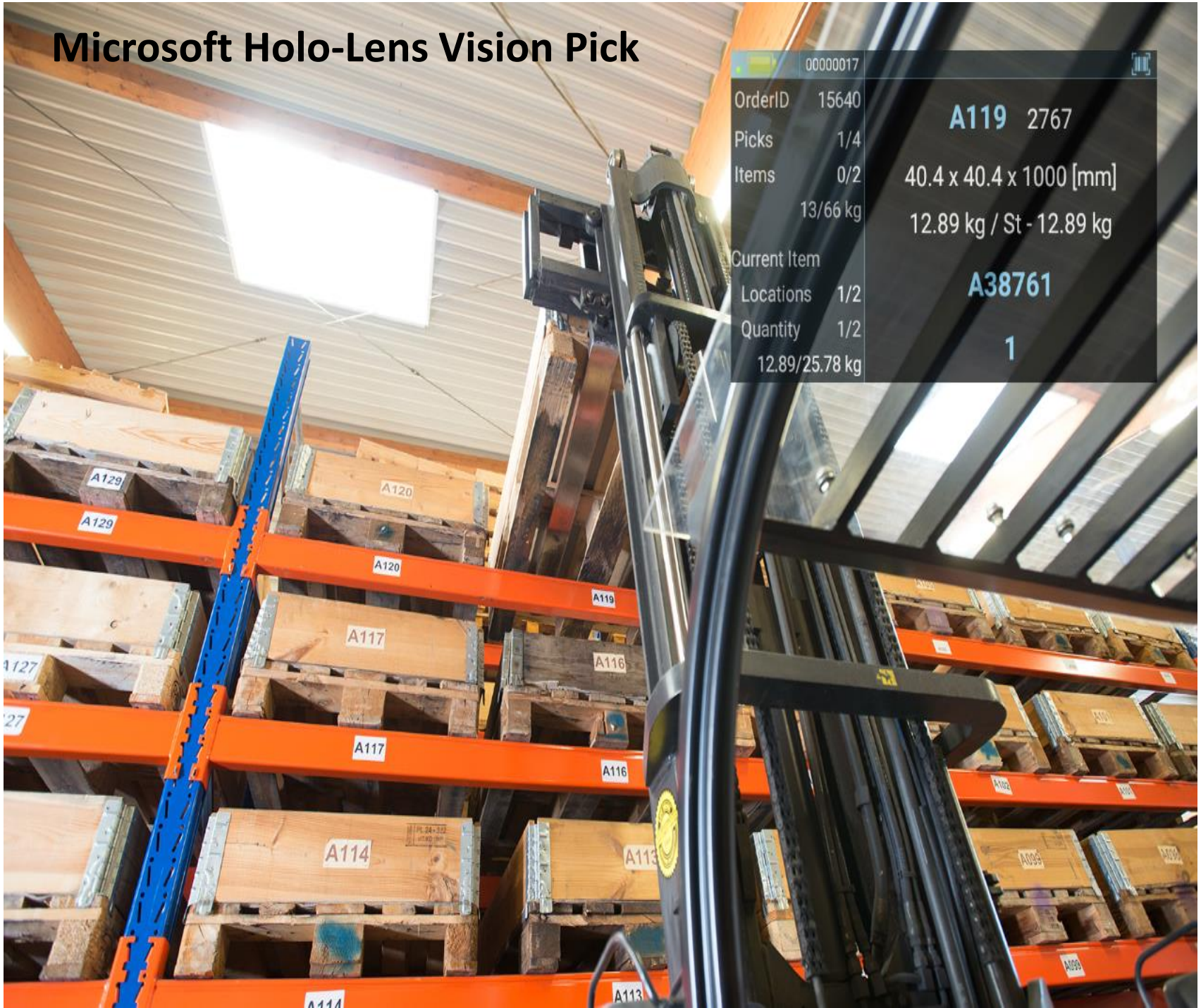



Bots automate easy tasks and make broad data sources accessible to AI.

AI learns to mimic and improve processes based on data handed over from RPA.

# Maritime AI

## Microsoft Holo-Lens Vision Pick



# Applying Supply Chain Management

AGV- Laser Guided

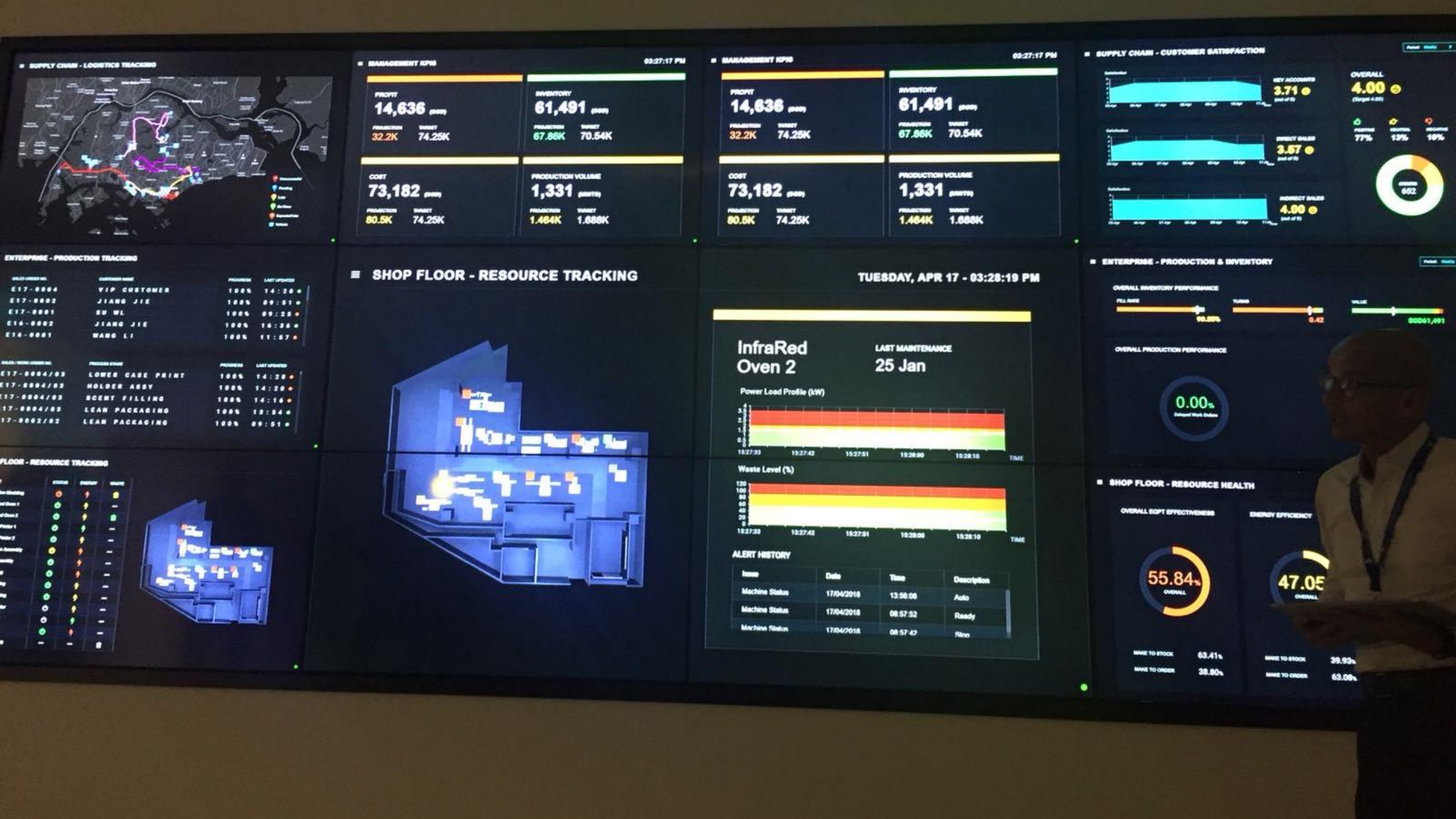
AGV- Track Guided

ASRS

Carousel

Exoskeleton

AI Optimization


SUPPLY CHAIN - LOGISTICS TRACKING
MANAGEMENT KPIS
03:27:17 PM
PROFIT
14,636
32.2K
74.25K
INVENTORY
61,491
67.86K
70.54K
COST
73,182
80.5K
74.25K
PRODUCTION VOLUME
1,331
1.464K
1.688K
SUPPLY CHAIN - CUSTOMER SATISFACTION
OVERALL
4.00
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ENTERPRISE - PRODUCTION TRACKING
E17-0004 VIP CUSTOMER 100% 14:20
E17-0003 JIANG JIE 100% 09:51
E17-0001 SU WL 100% 09:25
E16-0002 JIANG JIE 100% 16:36
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E17-0004/03 LOWER CASE PRINT 100% 14:20
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E17-0004/03 SCENT FILLING 100% 14:16
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SHOP FLOOR - RESOURCE TRACKING
TUESDAY, APR 17 - 03:28:19 PM
InfraRed Oven 2
LAST MAINTENANCE
25 Jan
Power Load Profile (kW)
Waste Level (%)
ALERT HISTORY
Issue
Date
Time
Description
Machine Status
17/04/2018
13:56:08
Auto
Machine Status
17/04/2018
08:57:52
Ready
ENTERPRISE - PRODUCTION & INVENTORY
OVERALL INVENTORY PERFORMANCE
OVERALL PRODUCTION PERFORMANCE
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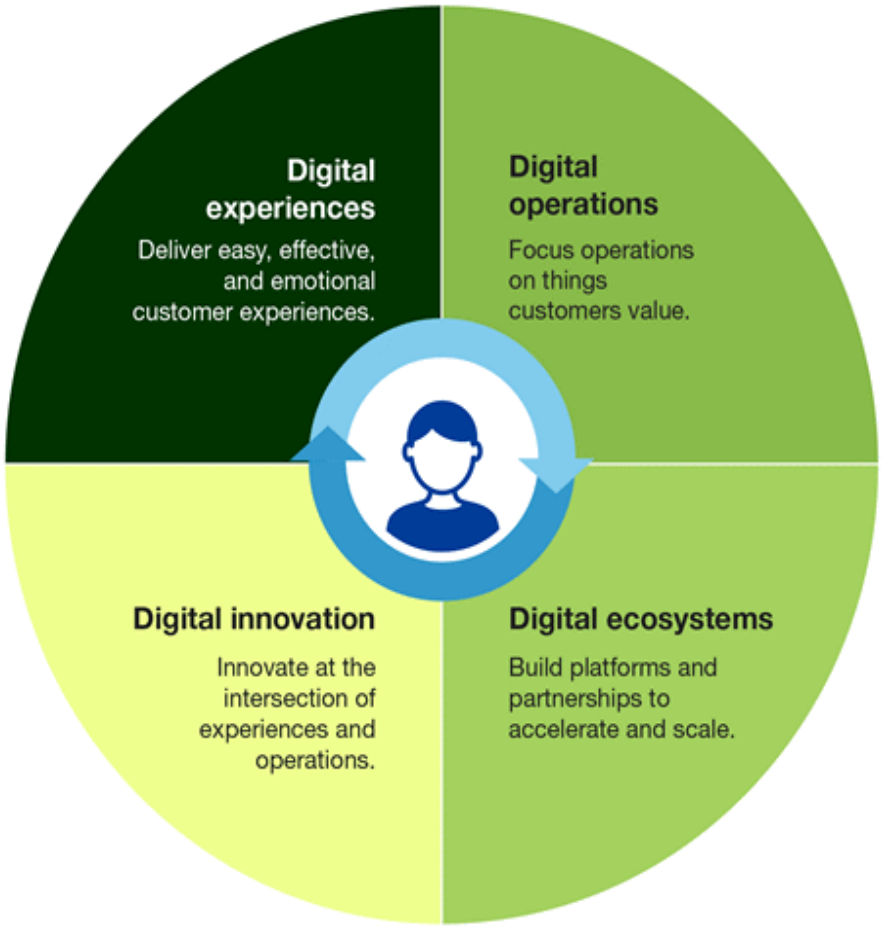
SHOP FLOOR - RESOURCE HEALTH
55.84%
MAKE TO STOCK 63.41%
MAKE TO ORDER 36.80%
MAKE TO STOCK 39.93%
MAKE TO ORDER 63.08%

# The Game Changer – Your Digital Journey

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**REINVENT YOUR BUSINESS WITH TECHNOLOGY . . . OR FADE TO BLACK**

Digital technology dramatically alters the balance of power between customers and companies. While customers gain the power of information and choice, digital technology also dramatically improves the economics of business.

Digital natives like Amazon, Netflix, Tesla, and Uber understand this. Their business paradigm focuses on using digital experiences to always deliver on rapidly evolving customer expectations and outcomes.

**As Jeff Bezos, CEO of Amazon, says:**

**"You want to be customer obsessed, not competitor obsessed. Customers are always dissatisfied, and they always want more. If you're competitor obsessed and you're a leader, you see everyone behind you, and you slow down a bit. But customers pull you along."**

https://www.youtube.com/watch?v=ozLaklIFWUI
DHL Smart WMS

# Questions & Answer

Microsoft

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HELPING BUSINESSES RUN BETTER

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