

Snijder & Associates B.V.
Strategic Advisory – Interim Management

Digitalization for Dry Bulk Terminals

10th of October 2019 – Martijn Snijder

“When digital transformation is done right, it is like a caterpillar turning into a butterfly, but when done wrong, all you have is a really fast caterpillar.”

George Westerman MIT



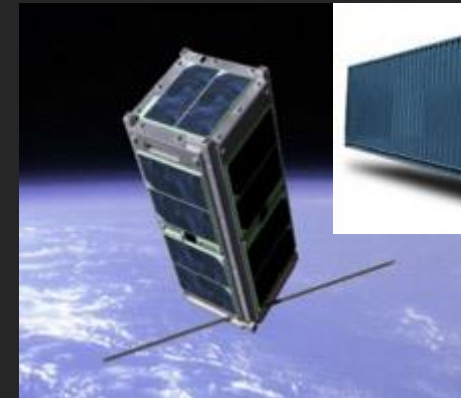
Agenda

Digitalization

- 4 focus areas: Safety, Compliance, Uptime, Productivity
- State of Technology:
 - (Flexible) Automation: robotics, unmanned vehicles
 - Intelligence: Optimization, Artificial Intelligence
 - Connectivity: IIoT, collaboration & blockchain

Biggest industry challenge

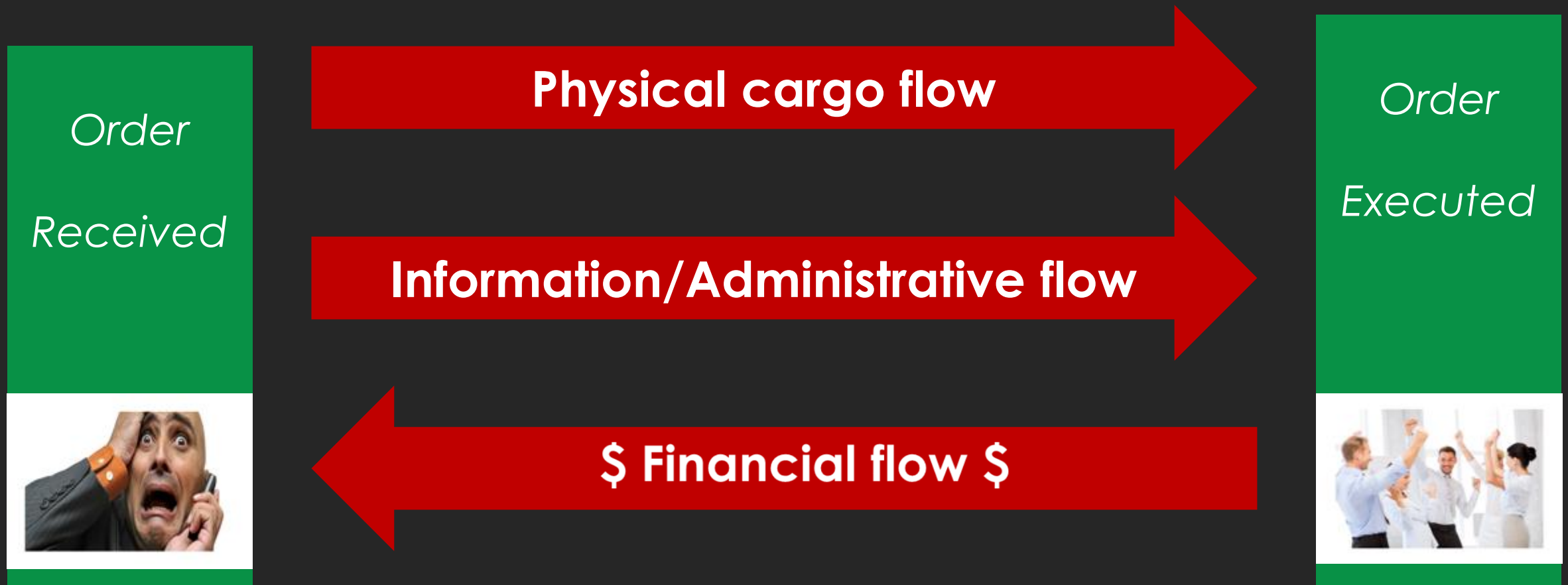
Recommendations



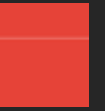


> 35%

Setting the scene: think parallel!



Setting the scene: bulk *is* different!



Separate/Discrete units

Vs.



Bulk/Processing



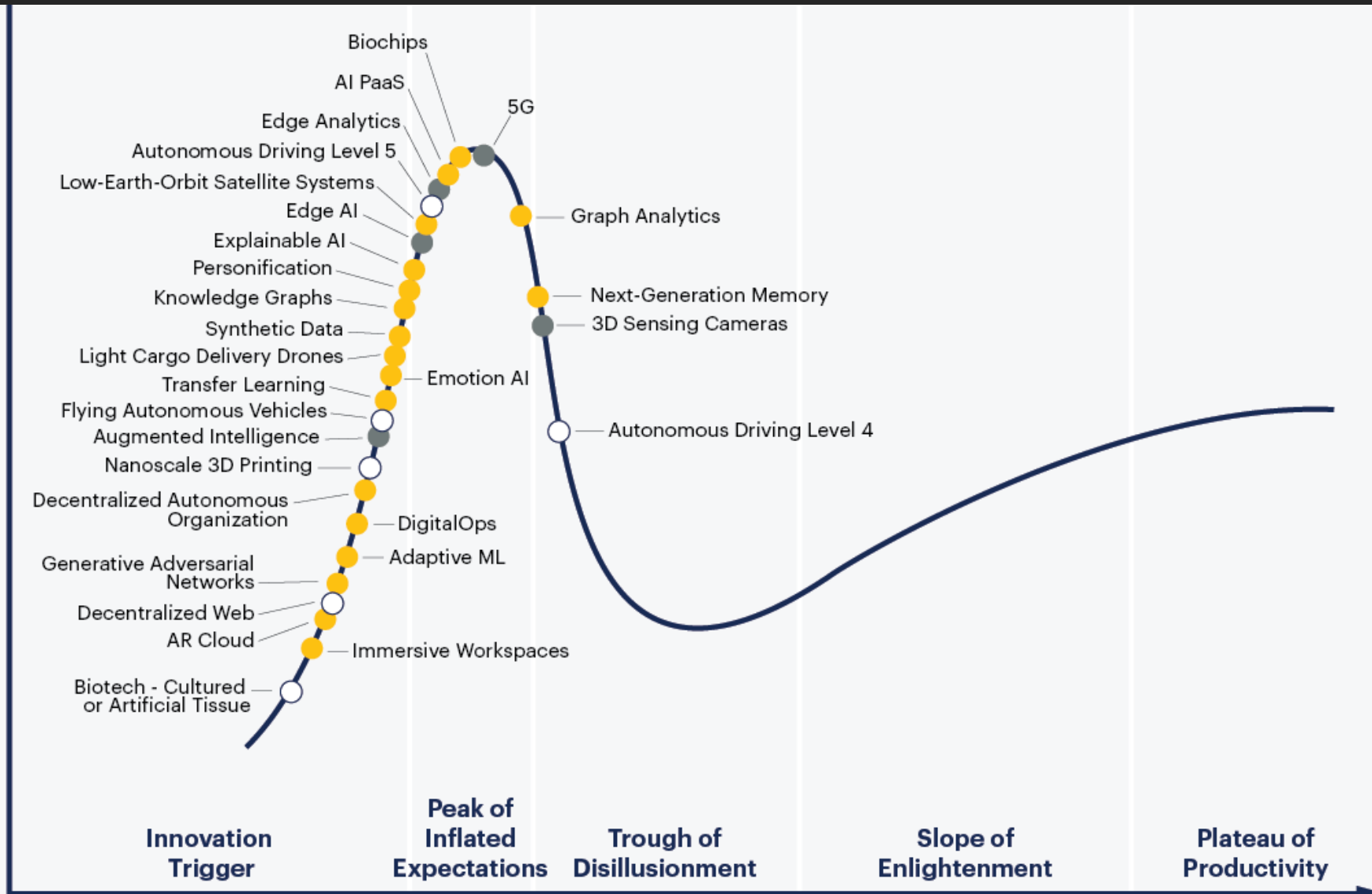
Setting the scene: overall approach

A digital transformation follows traditional transformation steps.



- Core admin/ERP system as “Single Version of the Truth”
- Standardization
- Transparency
- Pursuing “digital revenue streams”
- Create platform/buy-in for change management

Expectations



Plateau will be reached:

○ less than 2 years

● 2 to 5 years

● 5 to 10 years

○ more than 10 years

● obsolete before plateau

As of August 2019

Source: Garther hype cycle of emerging technologies 2019

Four solution areas are emerging

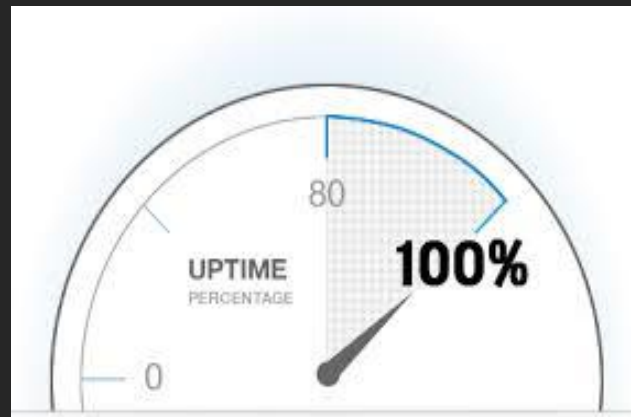
Safety



Compliance



Uptime



Productivity



State of (Flexible!) Automation



- Preventive maintenance
- Location, weighing, fuel economy
- Simulators, **Augmented Reality**
- **Autonomous vehicles (mining)**



- Automated stacker/reclaimers
- Link to optimization & predictive maintenance
- **Image analytics**
- Fully automated Train Loading Systems



- Preventive maintenance
- Remote operation
- Automated unloading cranes

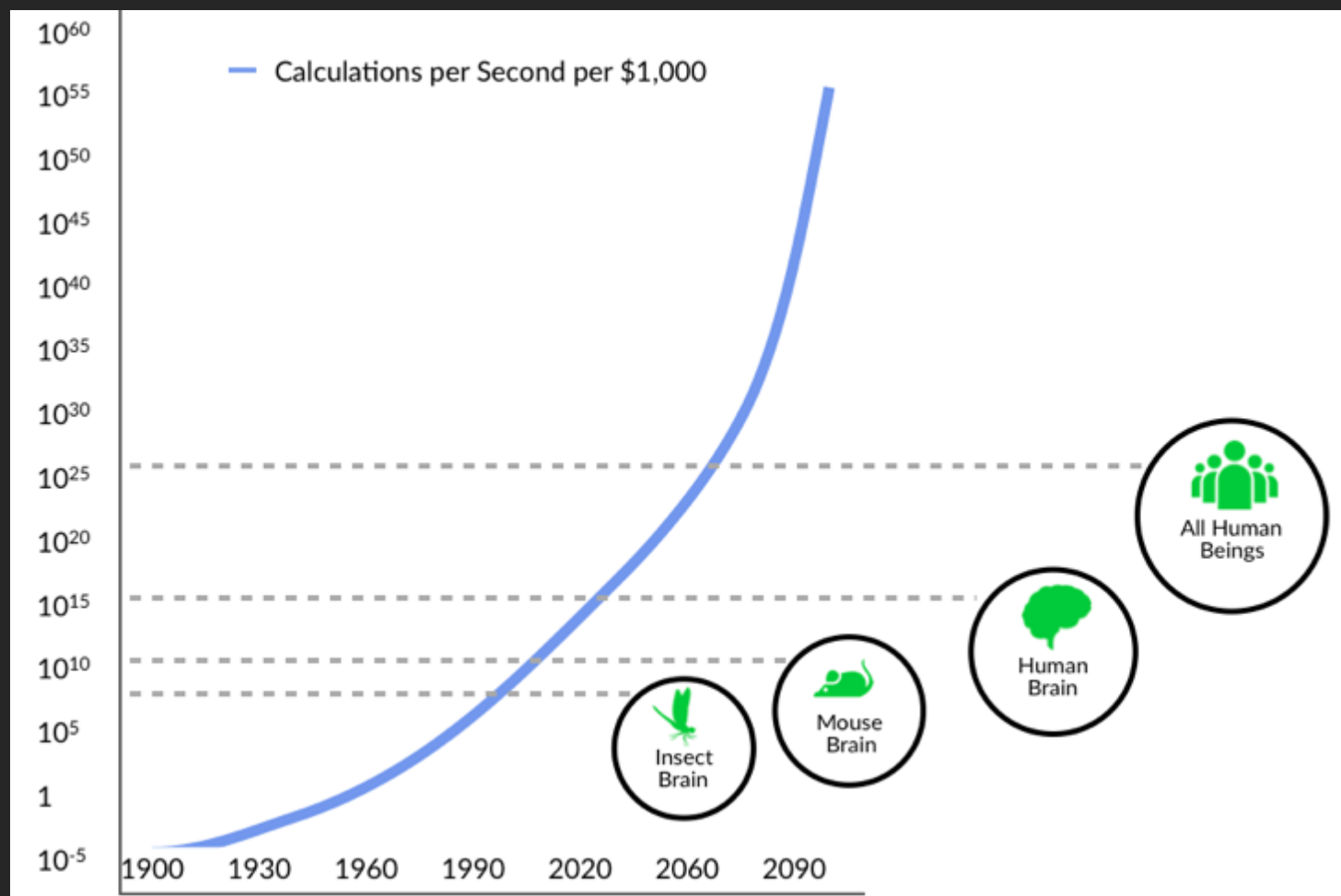


- Intelligent automated control
- Supplies software platforms
- 3D-printing spare parts

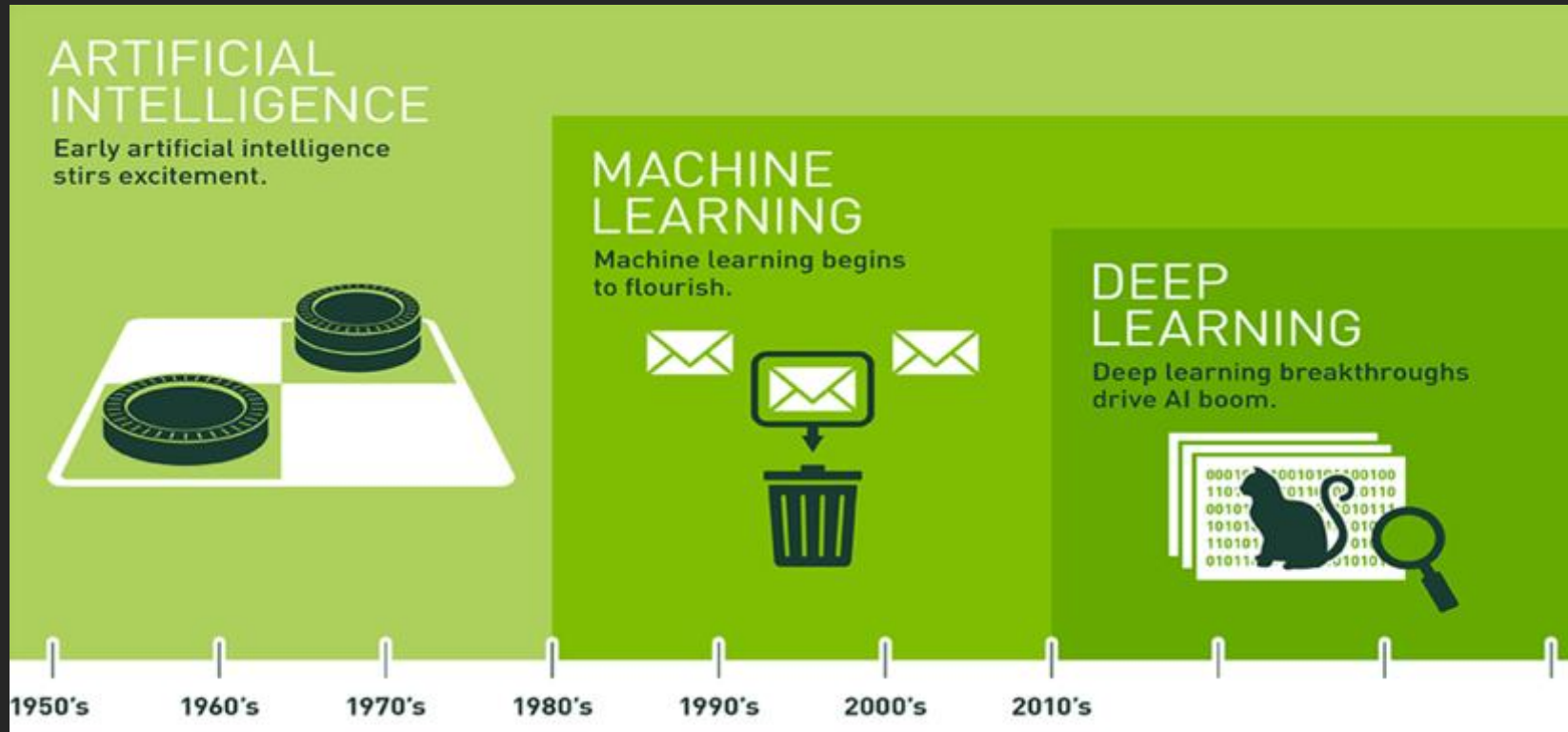
State of Intelligence: computing speed



1. Data
2. Computing speed
3. Time



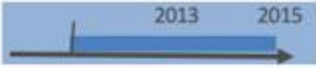
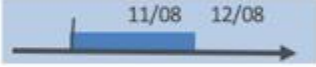

Artificial Intelligence



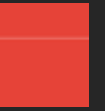
Small/Narrow AI	Big/General/Strong AI
Single task, local application	System-wide
Rules based	Machine/Deep Learning
Example: Amazon 1-click, PLC, augmented reality	Example: IBM Watson, self learning process operation system, holistic planning

Intelligence: Planning Optimization



	CAPABILITIES	BENEFITS	HORIZON
Demand and strategic planning	<ul style="list-style-type: none">• Product mix optimization• Demand planning• Supply chain scenarios• Long-term material planning• Long-term capacity planning• Monthly rolling forecast	<ul style="list-style-type: none">• Accept the most profitable product mix• Improve supplier contracts• Minimize inventory costs• Increase long-term delivery performance	Years ahead, quarterly, monthly 
Tactical planning	<ul style="list-style-type: none">• Order promising• Sales budget allocation• Order planning• Material planning• Optimal loading of wandering bottlenecks• Campaign planning	<ul style="list-style-type: none">• Improve delivery performance• Improve customer service• Reduce lead times• Reduce inventory• Increase throughput	Weeks ahead, daily 
Scheduling	<ul style="list-style-type: none">• Detailed scheduling• Material reservation• Batching• Slitting optimization	<ul style="list-style-type: none">• Increase throughput• Increase yield• Improve delivery performance• Reduce costs• Improve quality	Hours, minutes ahead 

State of Connectivity: IIoT – connected devices



Connectivity: Collaboration, Blockchain



Collaborative planning



- Successfully done by dominant shippers (e.g. Walmart)
- Low standardization of data protocols hinders a wide use
- Focus is supply of Real-Time data and First/Last Mile

Blockchain



- From “Blockchain Tourism” now to practical applications
- Leading are financial industries, hydrocarbons, power
- E.g. Documentary Credits, Bills of Lading, E2E trading
- Trend: increased joining of consortia

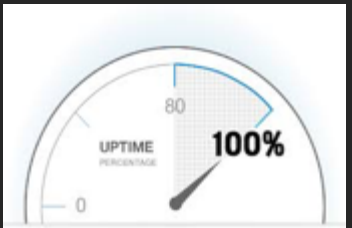
Real-life examples:



Dynamic access control of staff, geo-fenced and linked to training



Compliance through scheduling hourly workers

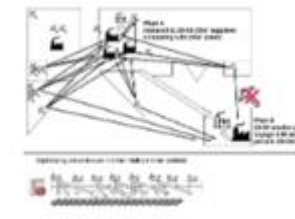


Uptime by linking fault diagnosis with automated maintenance planning

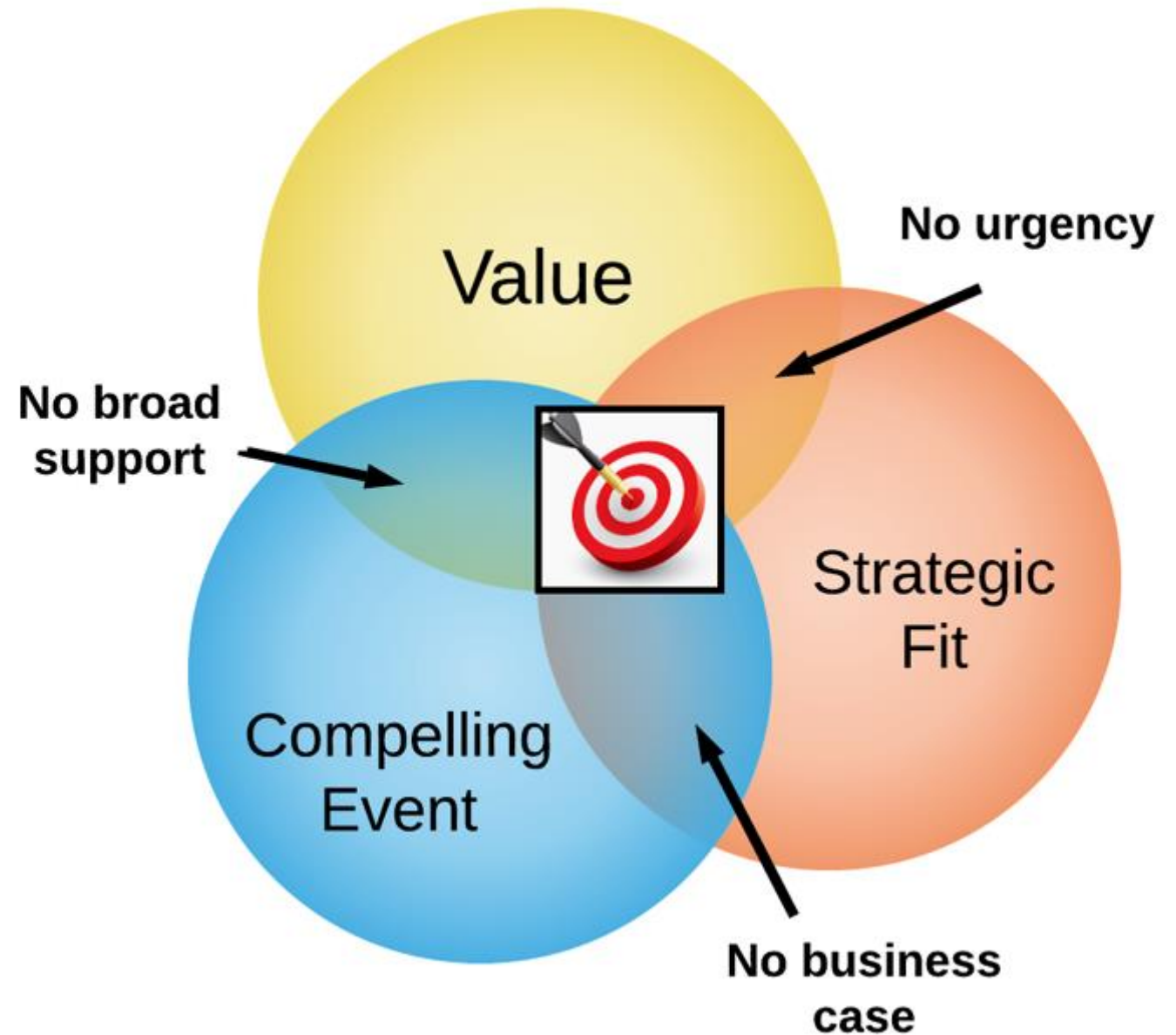


Productivity by AI steering dynamic planning of equipment and workforce

Big challenge: Initiative Overload



When to move:





The right digital solutions will improve economics, resolve issues, improve collaboration (more opportunities)

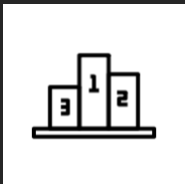
Recommendations:



Consider a short payback period based on “hard” benefits, e.g. <6 months for clear success *and* filtering good ideas



Build a roadmap, conduct careful change management, and consider (low cost!) pet-projects to encourage learning



Don't decide before you have alternatives, and always be ready to spend 2x costs, effort & time!

Closing remark:
>35%, but don't *just* resolve yesterday's problems..

