

Digital Operations

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Digital Operations:

Digital Levels

0. Not computerized

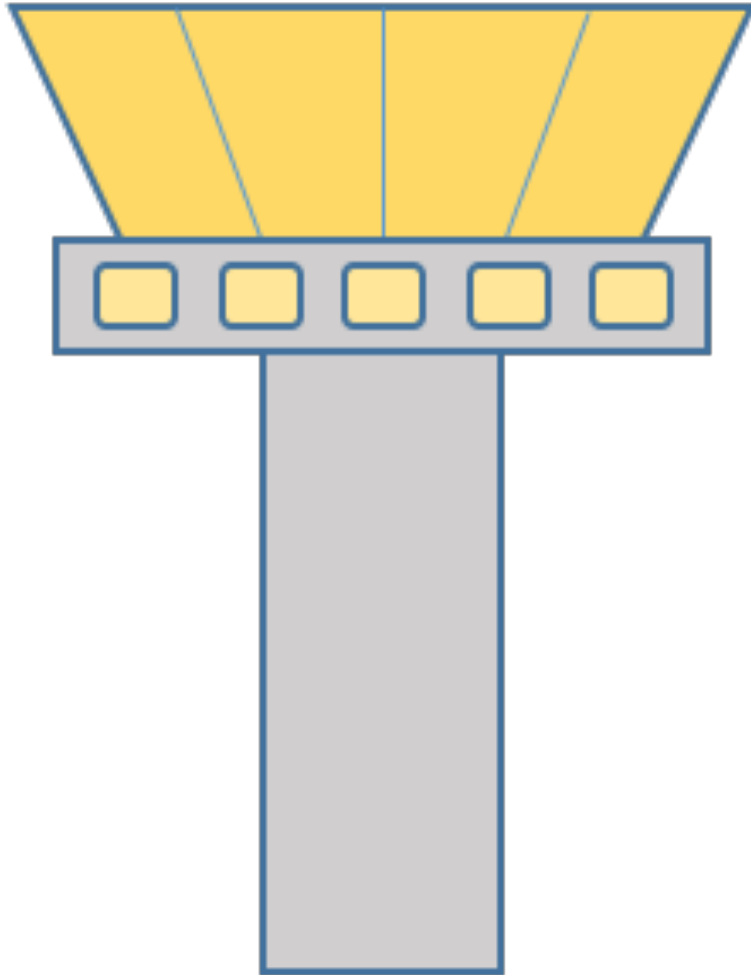
1. Siloed application

“Workflow is digitally supported,
if not fully executed”

Control Towers



Digital Control Towers in Supply Networks



1. Visibility

- You have visibility of events & milestones across the entire network

Digital Level 5

5. Connected devices/mobile/wearable

2. Alerts

- You receive alerts for SLAs and leadtimes of events & milestones (and resolve them in real-time)

3. Decision Support

- You execute transactions and users make decisions based on what intelligent agents recommend

4. Autonomous

- Intelligent agents run the supply network without human intervention



**Automation &
Autonomy**

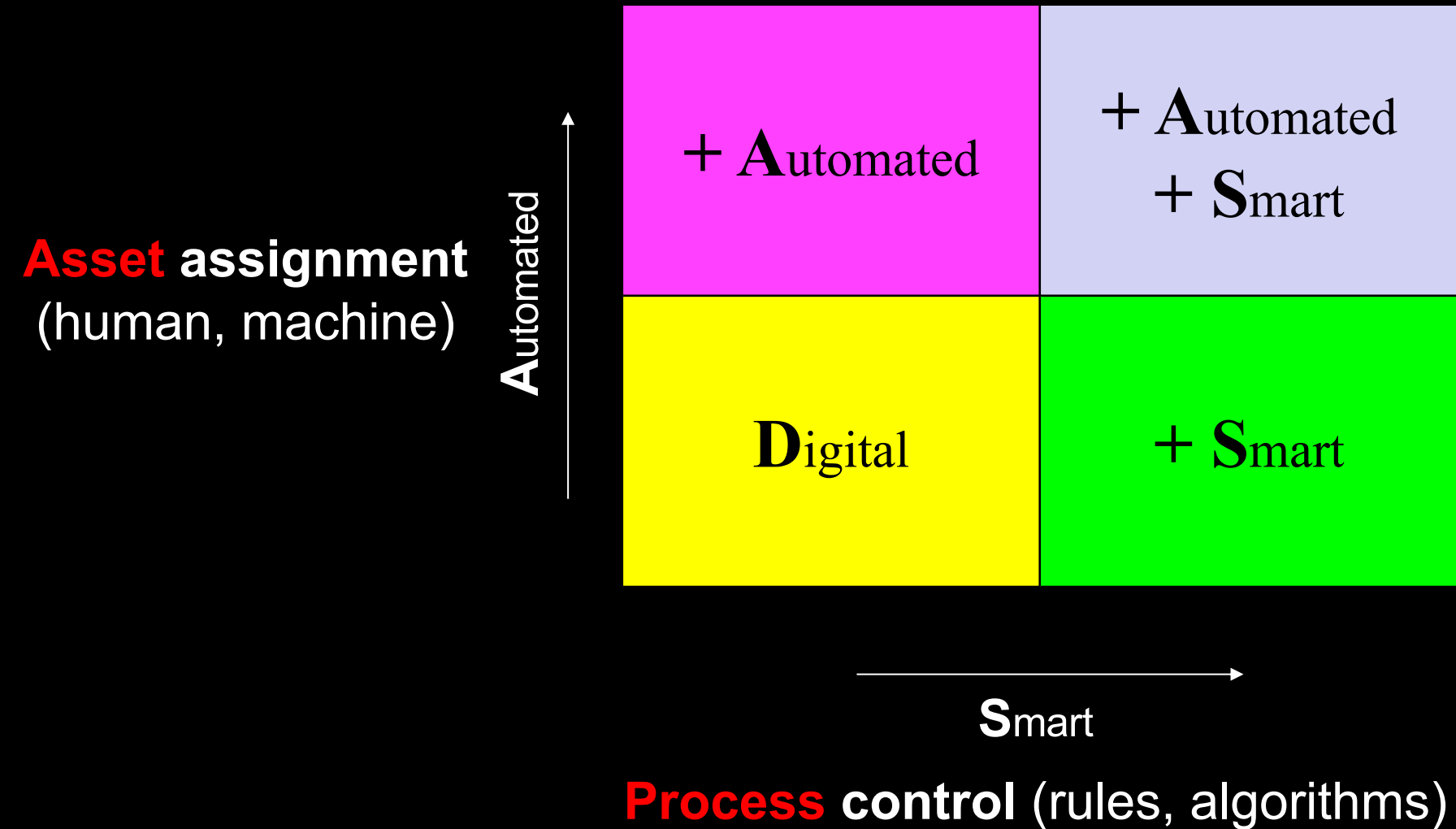
Digital
enables

Smart Control
(Decision Support)

And Autonomous
Automation?



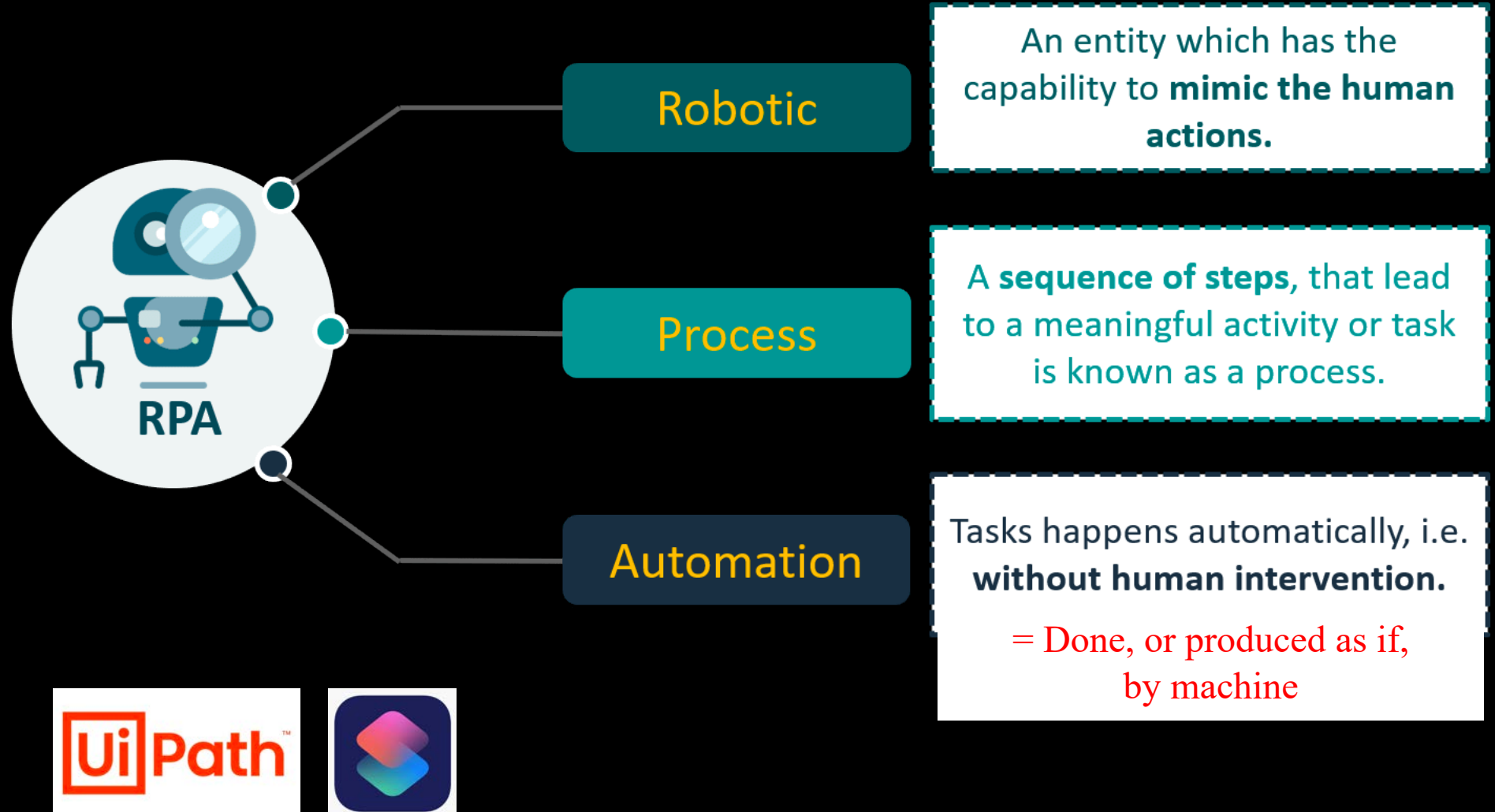
Digital Operations: Framework



Aspiring structural understanding

1. As-is: Diagnostic
2. Could-be: Where (not) to go

Robotic Process Automation (RPA) *automates* repetitive tasks



SUPERVISED Automation
= Machine + Human

AUTONOMOUS Automation
= Machine

Attended Automation



Unattended Automation



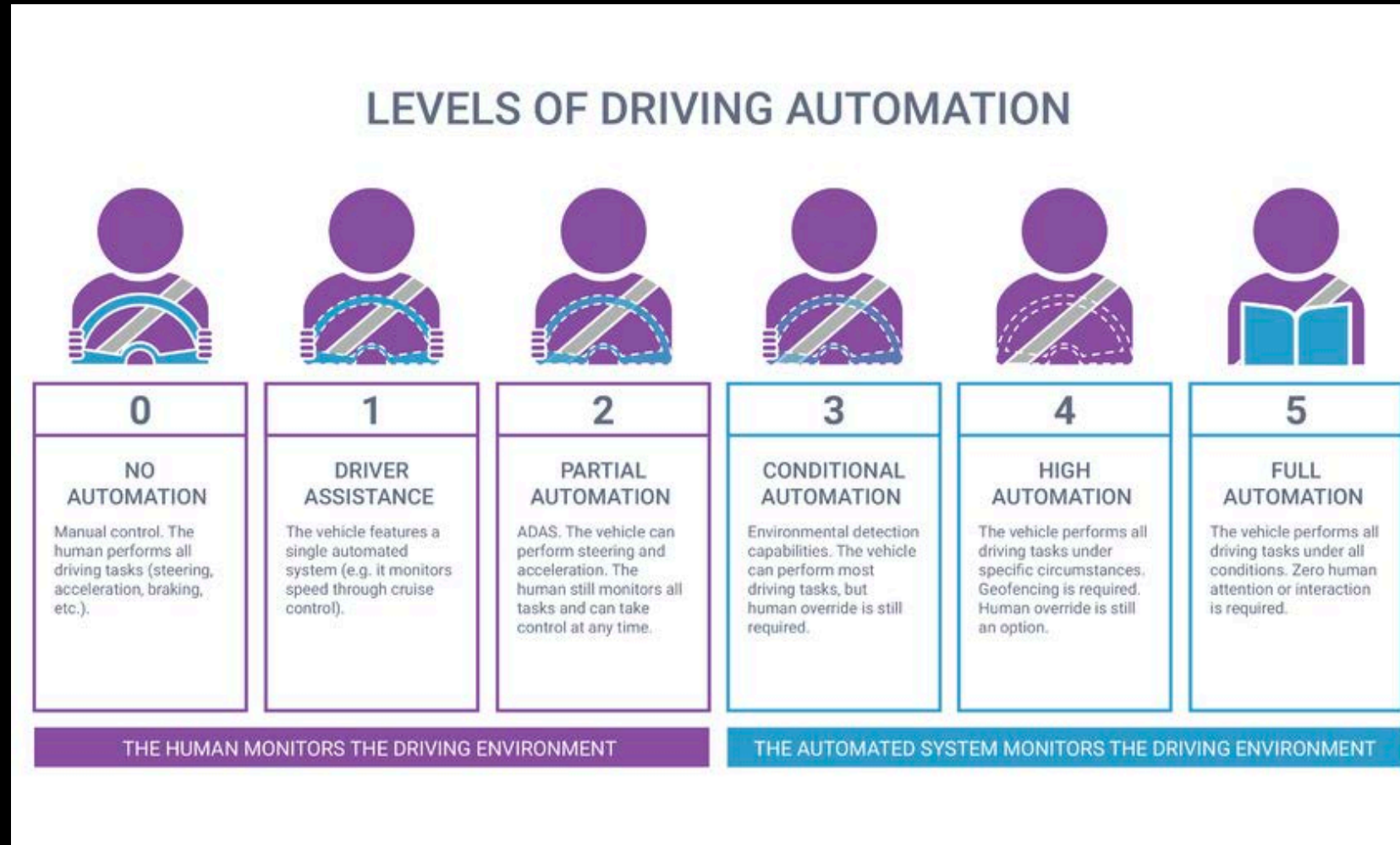
Front Office Automation

Configure bot to work together with the human

Back Office Automation

Fully automate by teaching the robot how to do it

Levels of Automation & Autonomy



Smart Control may enable **Autonomy**



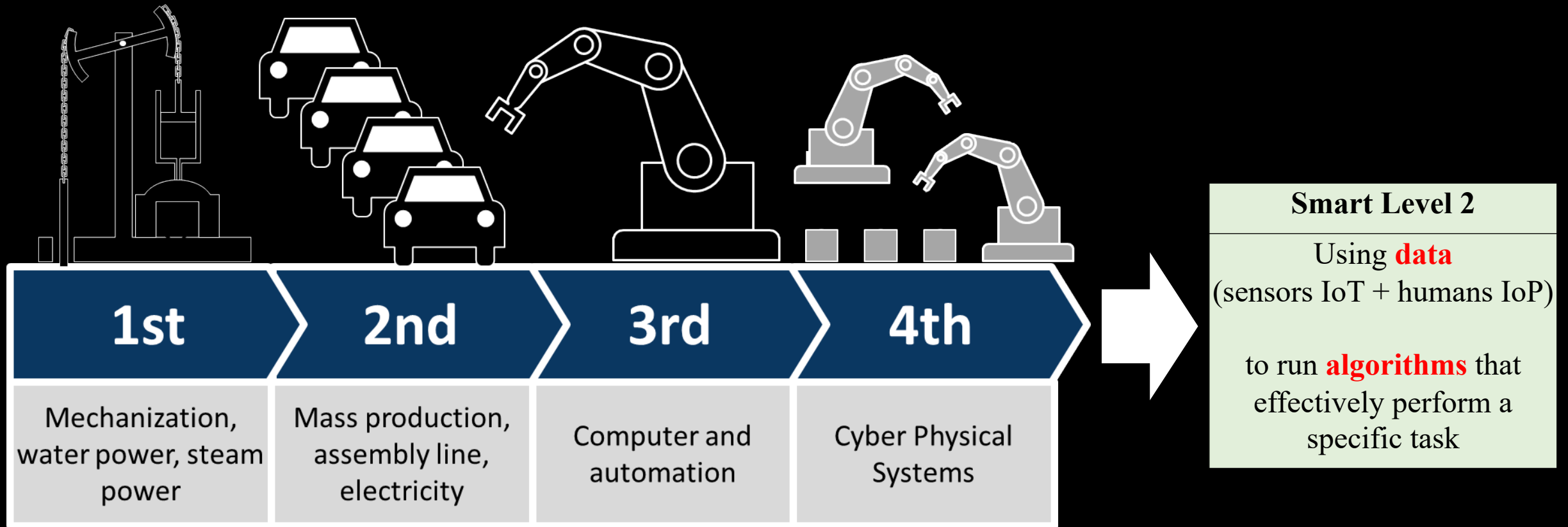
Jidoka = “autonomation”
(autonomous automation)

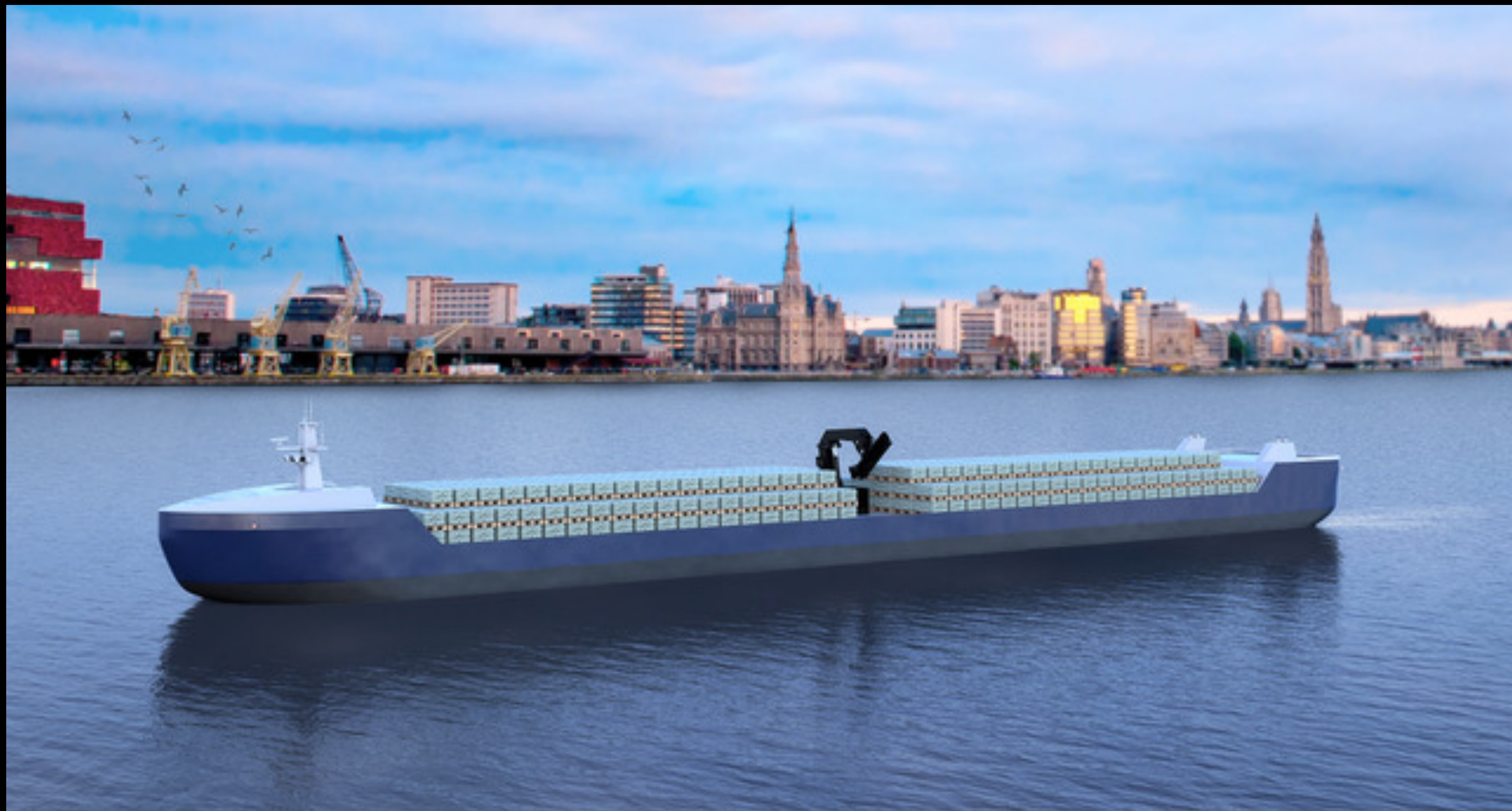
Smart Level 1

Explicit instructions contingent
on one feature (the thread)

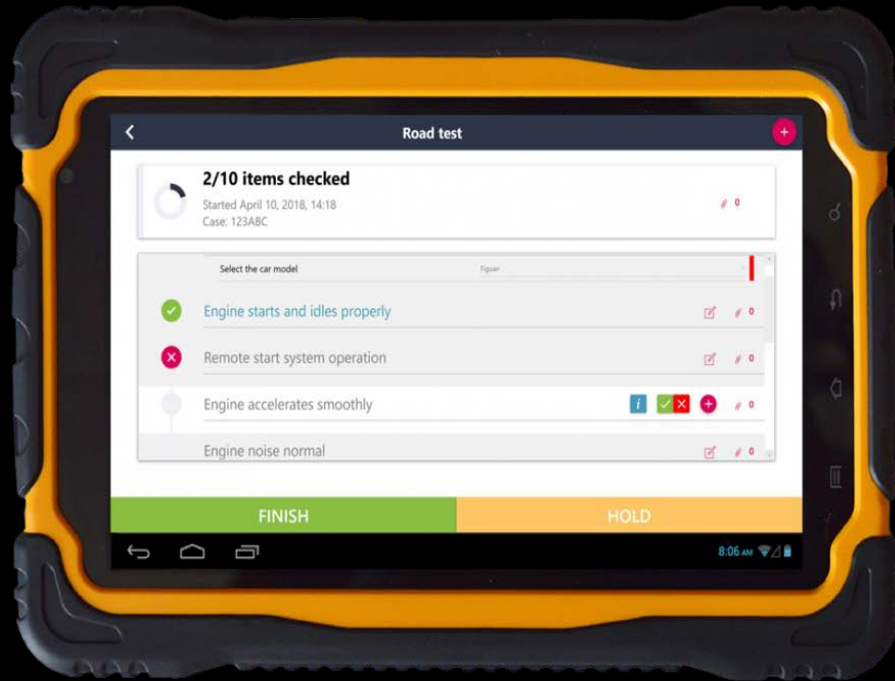
**1924: Powered textile loom with
automatic stopping device**

Industry 4.0 = Digitally connected smart systems





IoT can be complemented by operator (IoP) data



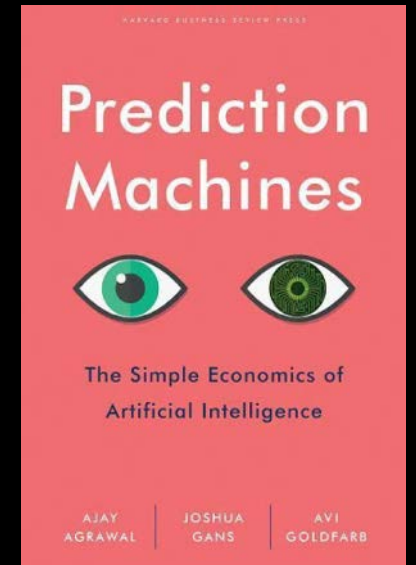
Operator logs information about a product or an installation.

This **feedback information** can take many forms: a simple check, a value, an answer to a multiple-choice question or a drawing.



Smart Level 3
=
Machine Learning

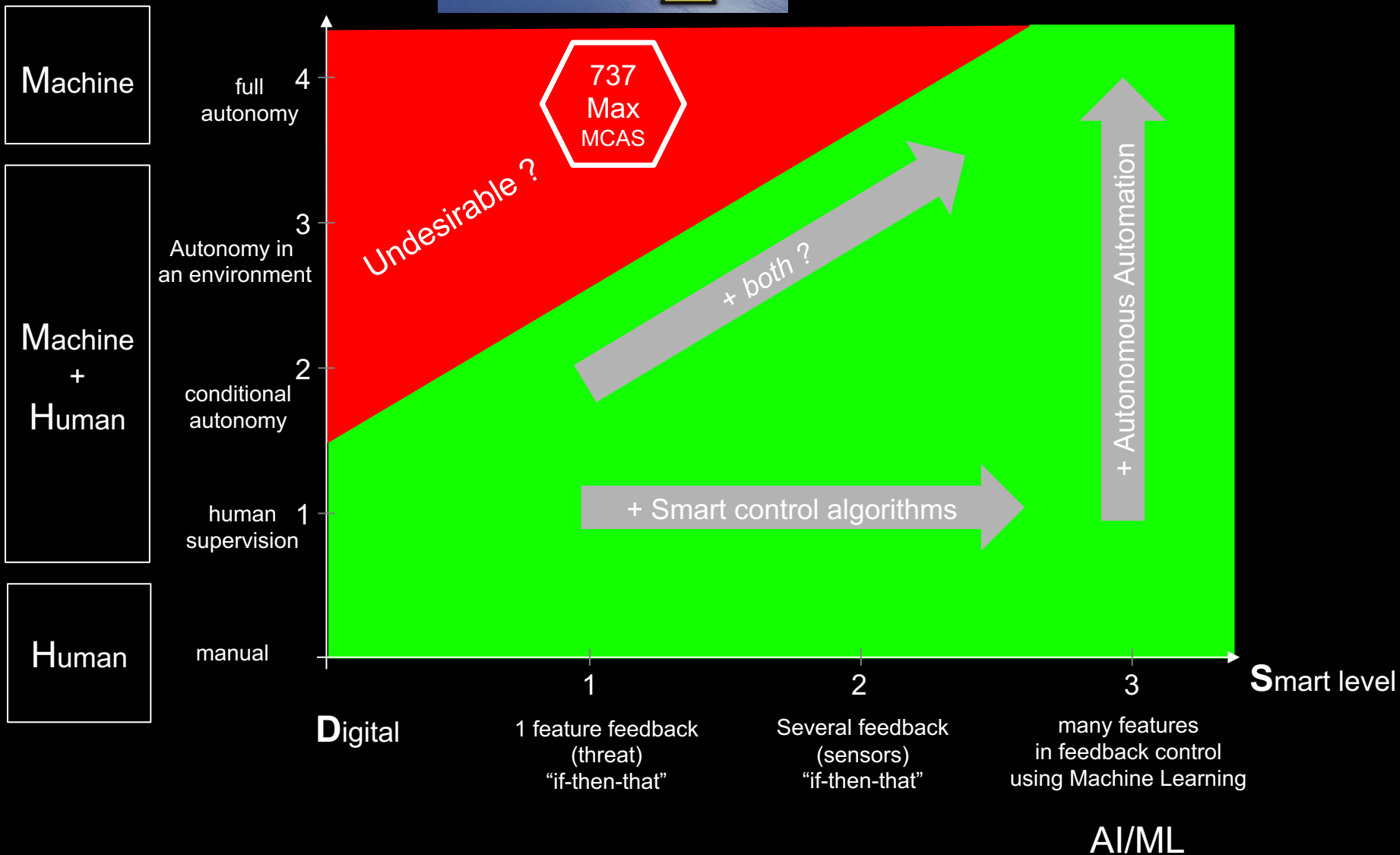
=
algorithms that effectively perform a specific task
without using explicit instructions,
relying on patterns and inference instead



March 15, 2016: AlphaGo beats Lee Sedol.
A milestone for the use of machine learning in decision support



Automation & Autonomy level





Digital Operations:

**Autonomous Automation and
the Smart Execution of Work**