



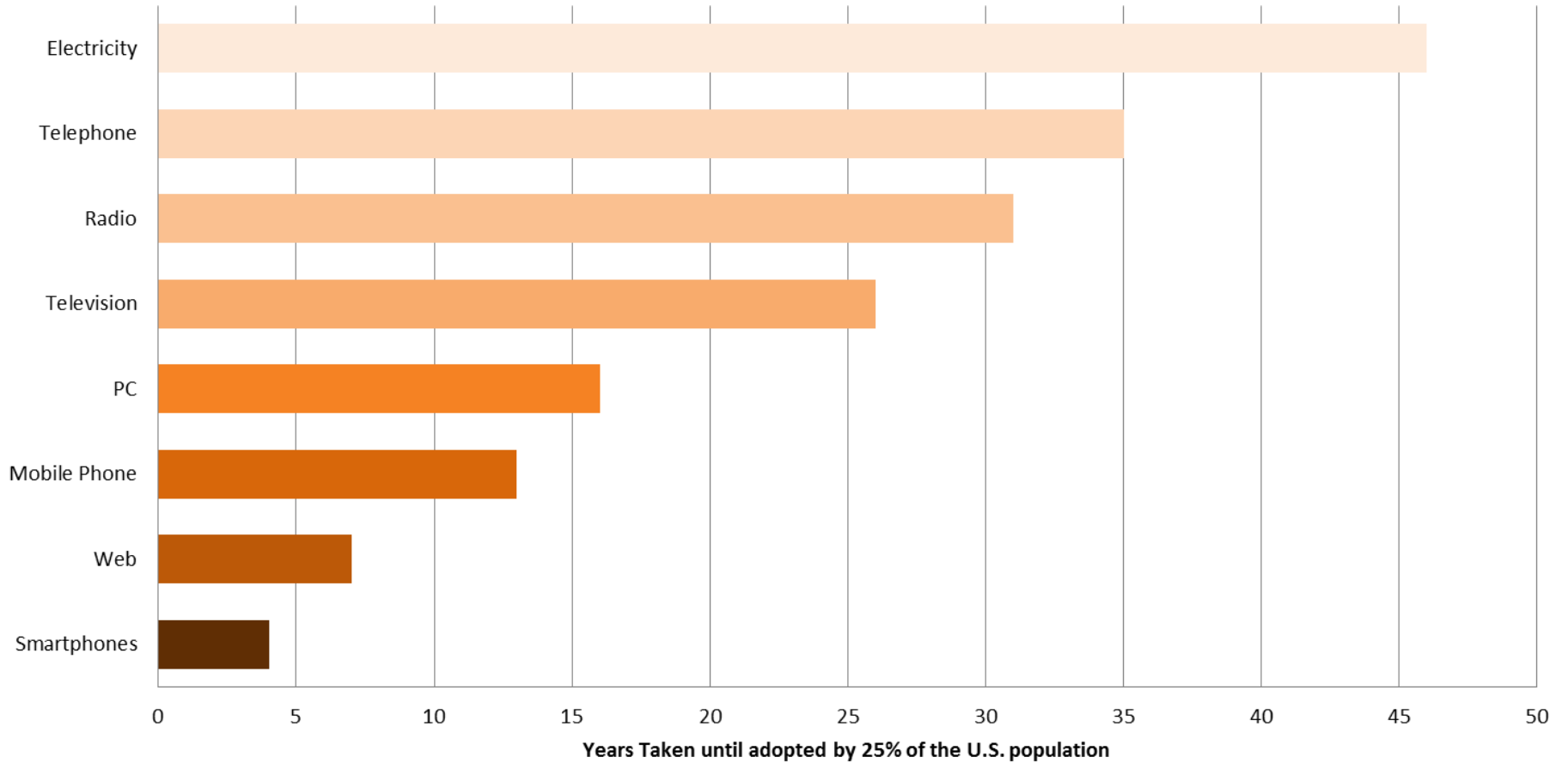
Emergent technologies: Disrupting the future of manufacturing

Tech Net SA 2016
University of South Australia

Mark Fusco, Advanced Focus

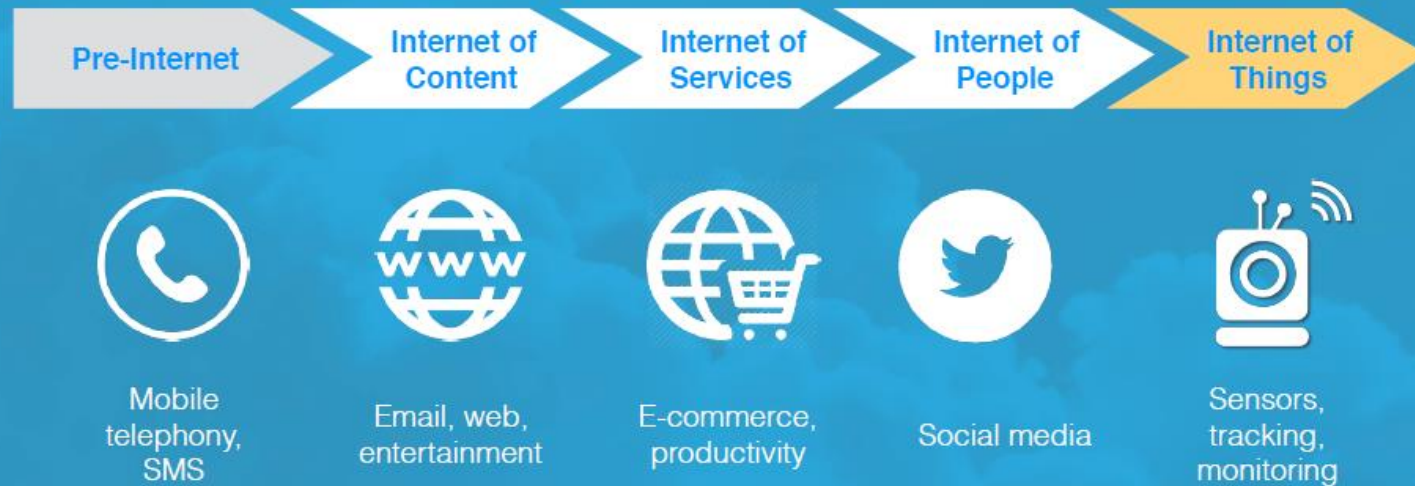
IT HAS NEVER MOVED THIS FAST.

AND IT WILL NEVER
MOVE THIS SLOWLY.



Adapted from W-BIRD- U.S Census, Wall street Journal

Internet evolution

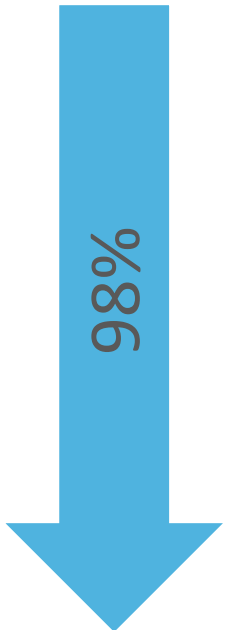


Why so fast and furious?

In the last 10 years ...

Technology Push

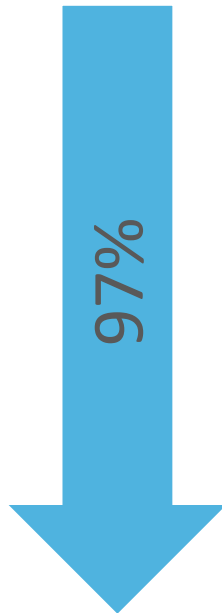
Cost of Data
Processing



Cost of
Sensors

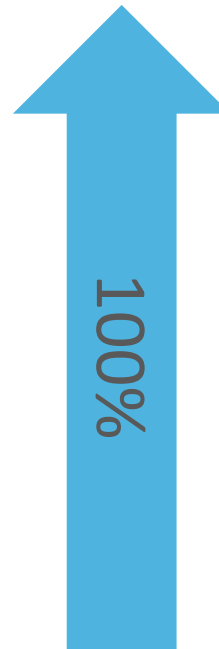


Cost of
Bandwidth

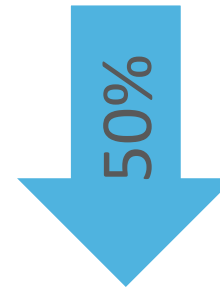


Market Pull

Product
Variety



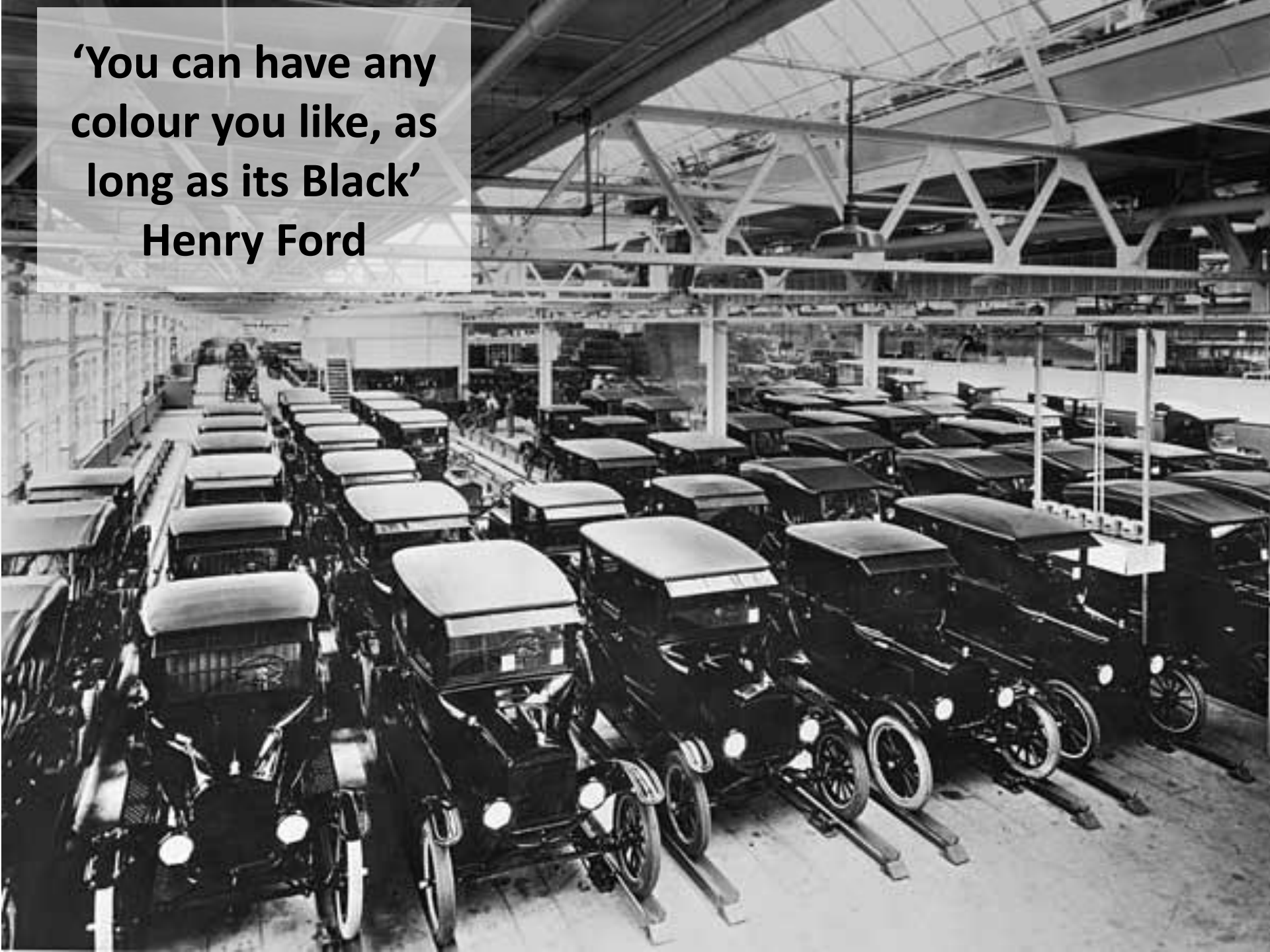
Product
Lifecycle

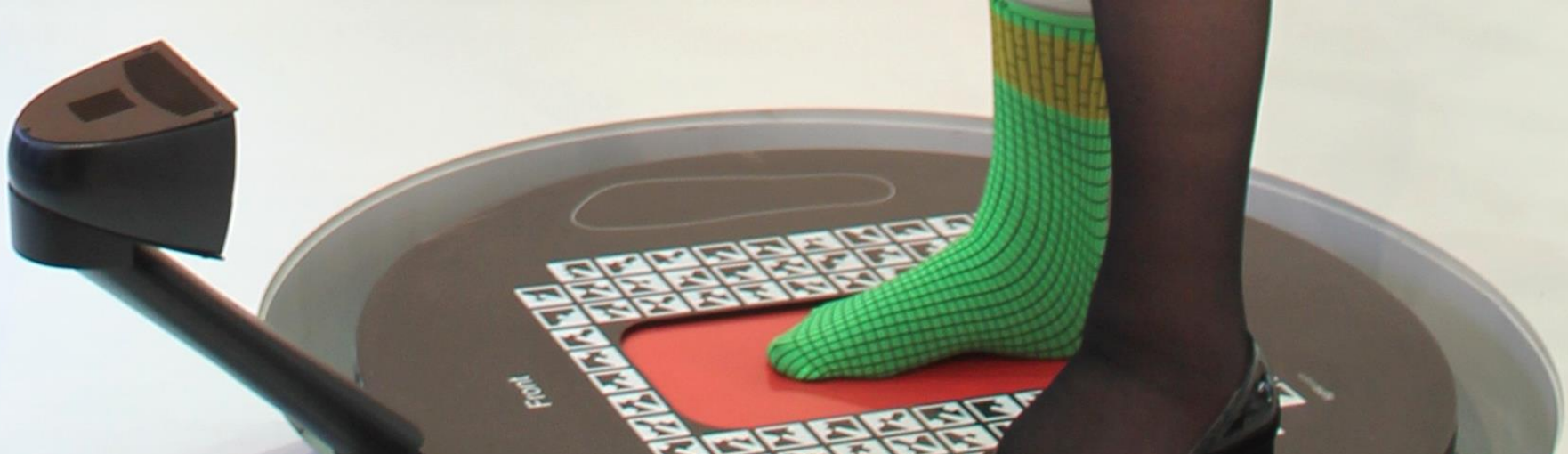


Average
Product Price



**‘You can have any
colour you like, as
long as its Black’
Henry Ford**





[USER ACCOUNT](#) | [LOG OUT](#)

[START NEW SHOE](#)

[WHAT IS MONGOLIAN BBQ?](#)

[BUILD IN STORE](#)

0 items
[VIEW DOGGIE BAG](#)

Audio On / Off



+ ZOOM

SIDE

7 OF 8

Eyestay



Metallic Gold Coated Leather
[See Detail](#)

Quarter



New Navy Nylon
[See Detail](#)

Formstrip



Metallic Silver Disco Square Leather
[See Detail](#)

Collar



Metallic Gold Coated Leather
[See Detail](#)

Metal Eyelet

TOP

5 OF 5

BACK

4 OF 4



FRONT VIEW



OUTSIDE VIEW



INSIDE VIEW



TOP VIEW



BACK VIEW

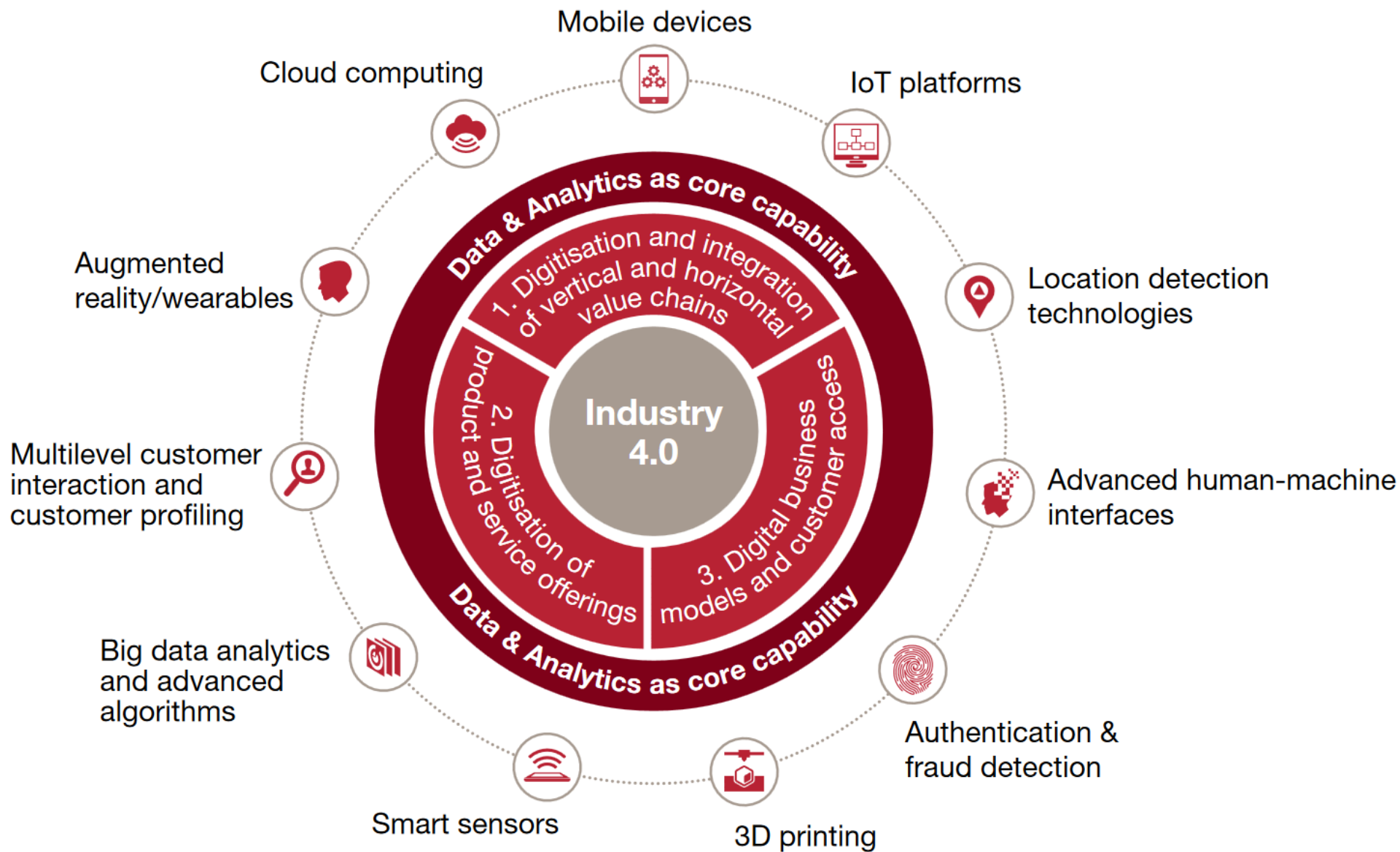
PRINT

Send To Friend

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CREATE ANOTHER

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IOT/Digital



3D Printing Additive Manufacturing



Advanced Robotics



Augmented & Virtual Reality

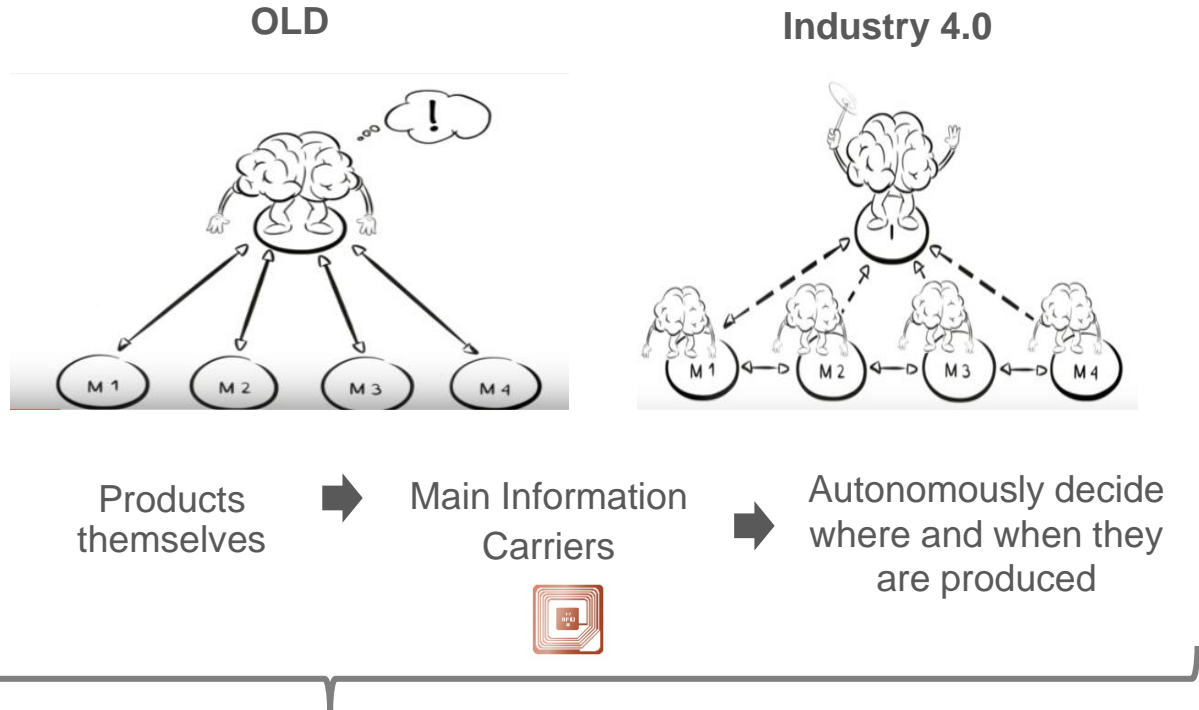
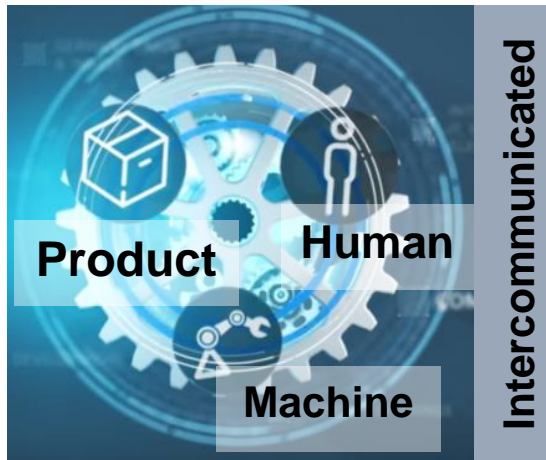


Drones



Industry 4.0

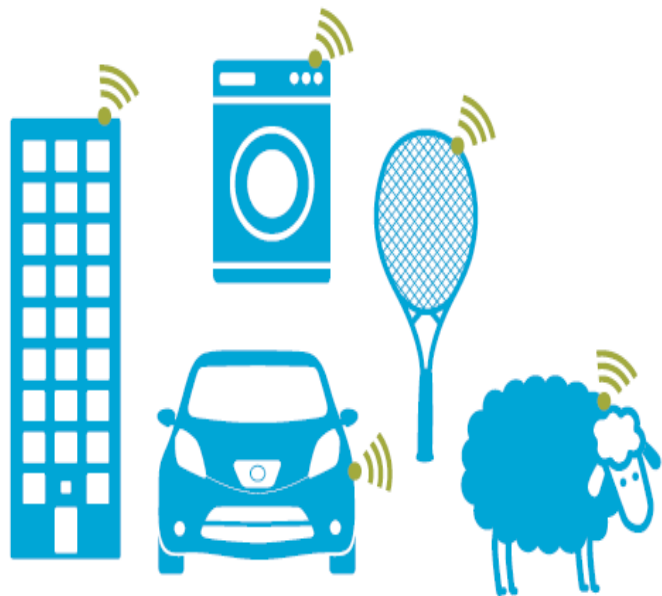
Self-organised Production
Process



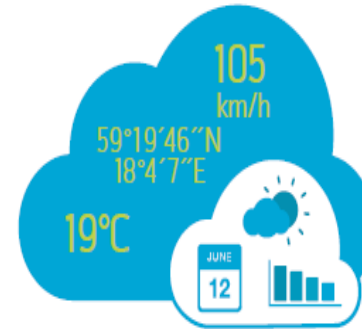
**Facilitates optimisation and customisation of all
production processes**



The connected factory, products & customers



Products & Devices are identified by intelligent sensors and connected to the Internet.



Connected objects collect and share information.

Connected objects can be monitored and/or controlled remotely.



New paradigm for innovation

Plantation

Controlled, predictable, planned

crops

Rainforest

Organic, serendipitous, interconnected

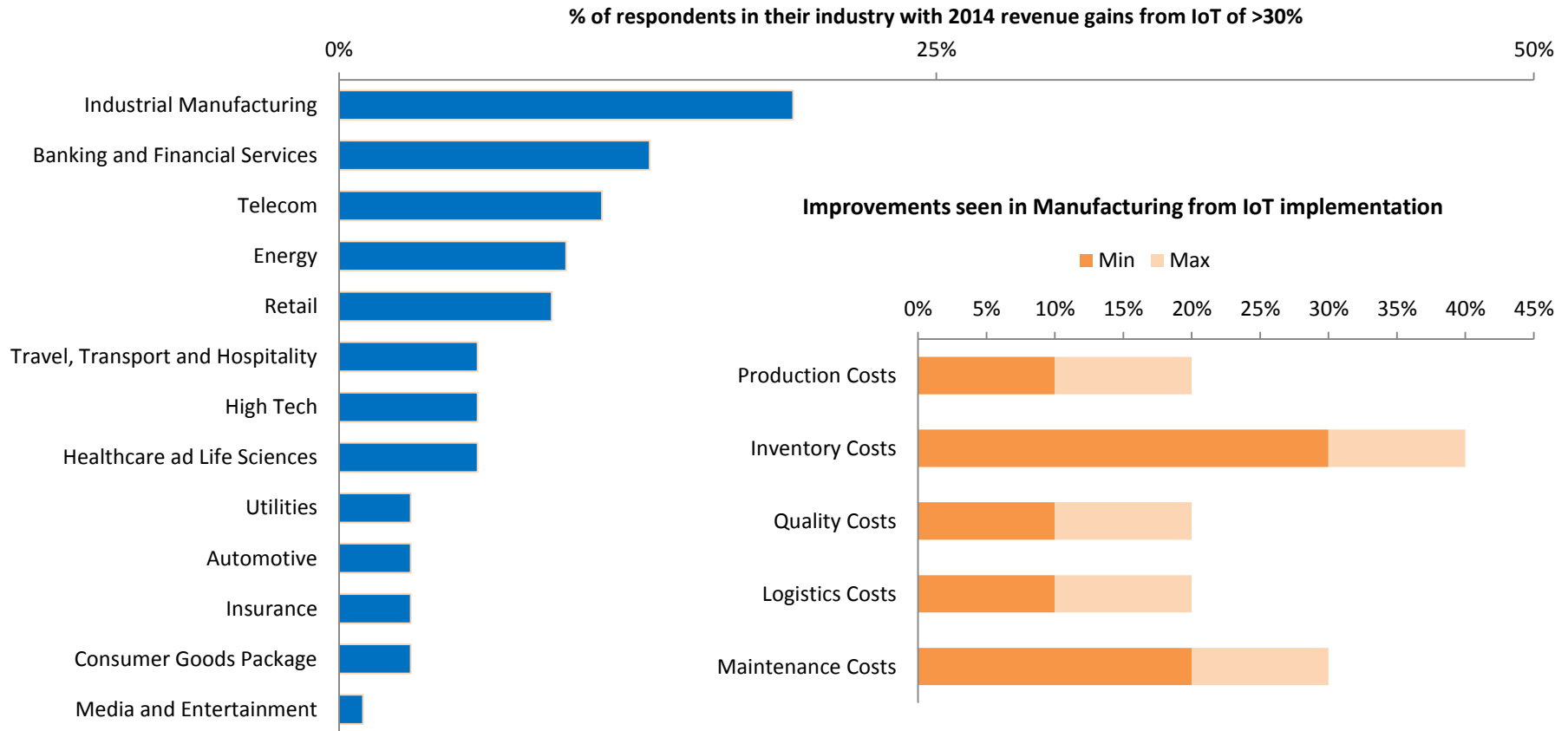
weeds

A new paradigm for innovation

Stratton, M. (2016). Digitization at Stena Metall. STENA.

Expected impact of connectivity

Industries seeing largest returns from IOT investments



Key Theme 1 - Complexity

Value shift 1 Hardware to Software

- Increased product complexity
- Shorter product life cycles
- Demand for differentiation

A modern vehicle contains 100 million lines of code to control:

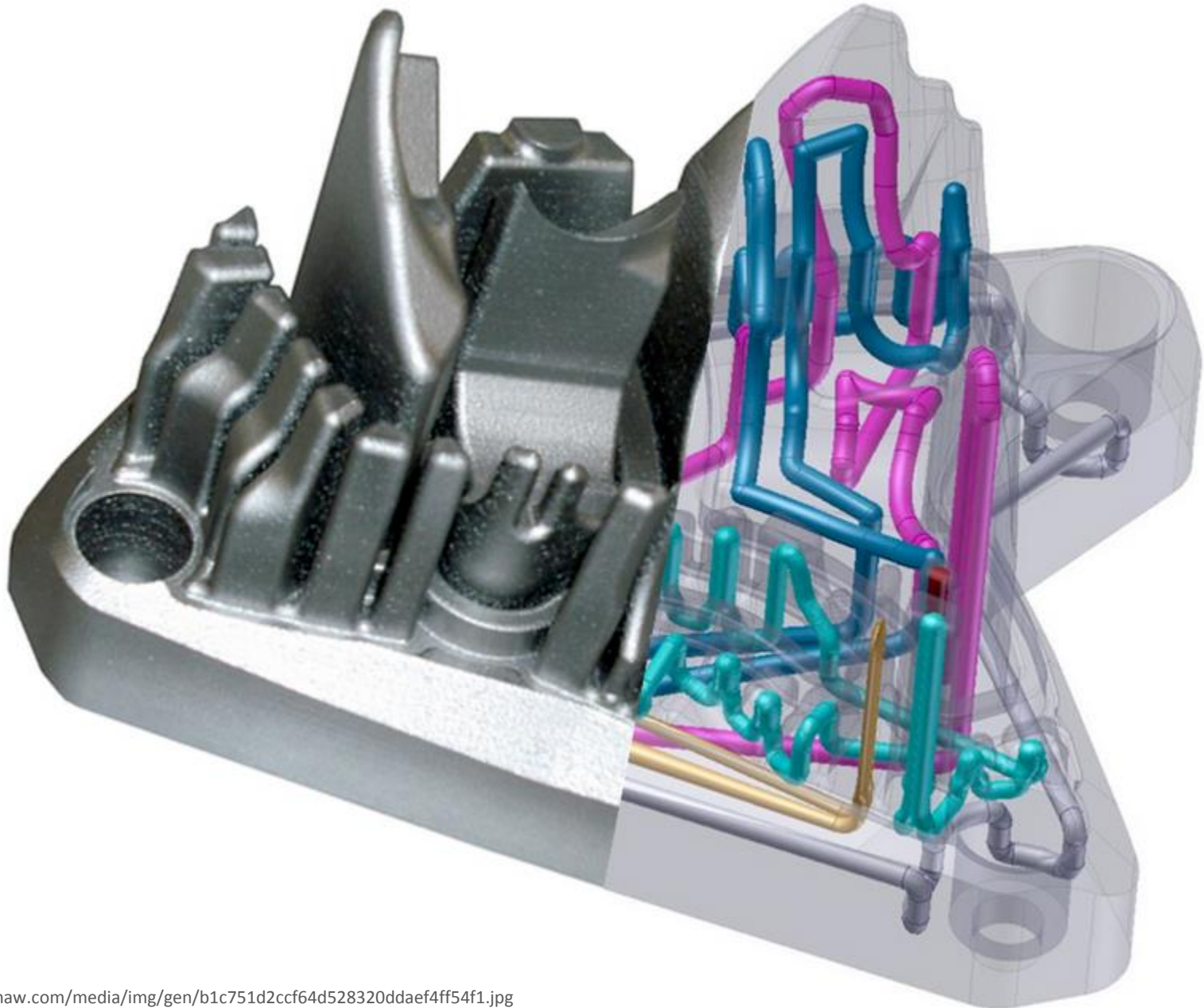
- Auto brake
- Driver assistance
- Engine control
- Entertainment
- etc.

Value Creation with AM



GE fuel nozzle.

Value Creation with AM



Value Creation with AM



What can be made?



Example: Rocket lab

Rutherford engine: First oxygen/kerosene engine to use 3D printing for all primary components.

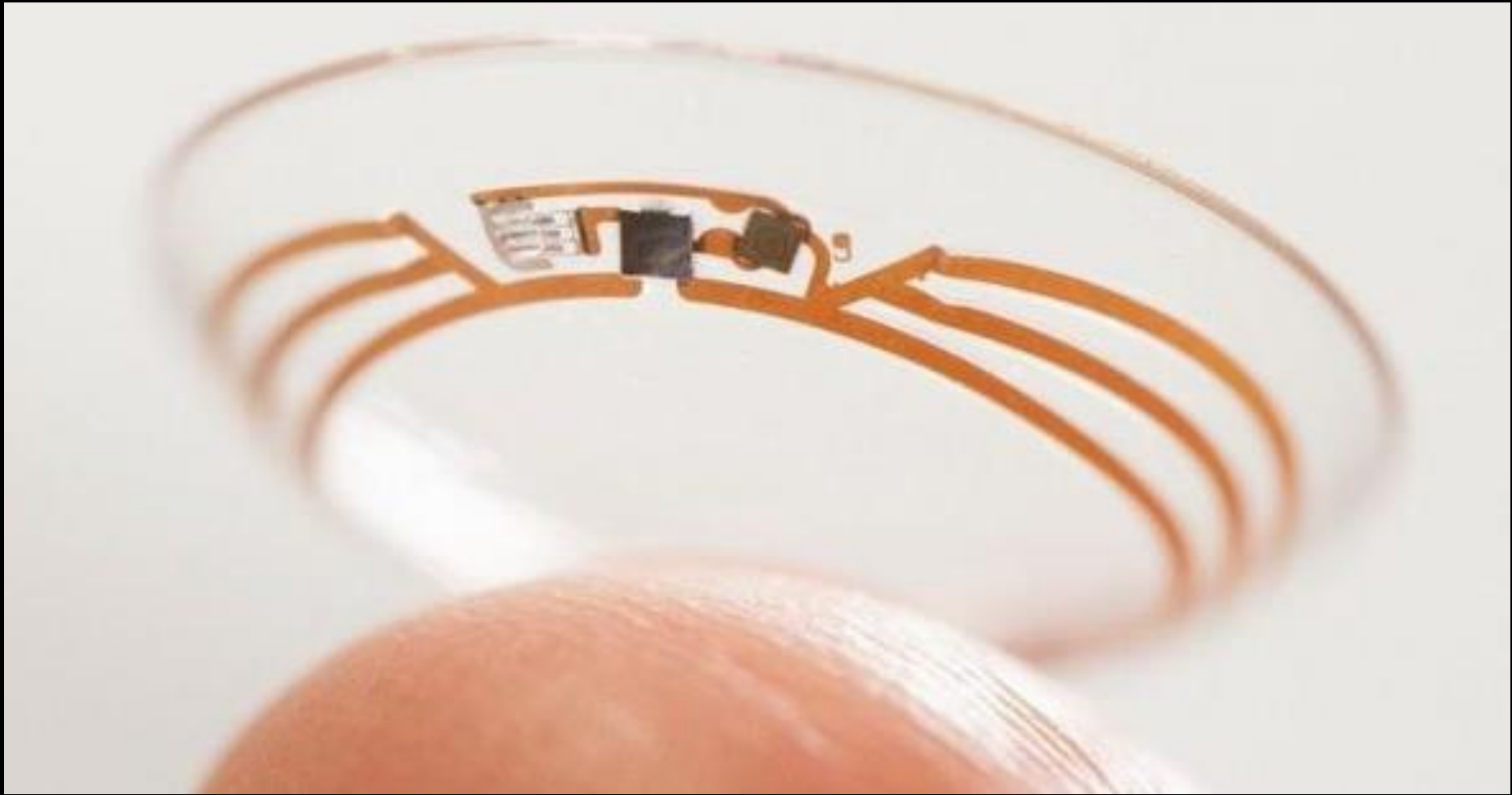
Engine print time:

24 HOURS

Augmented Reality









Advanced Robotics

Dangerous Work

Dull Work

Dirty Work

Global Robotic Market

Global robotic market

\$ billion

Personal | Commercial | Industrial | Military

2000



7.4

2005



10.8

2010



15.1

2015



26.9

2020



42.9

2025



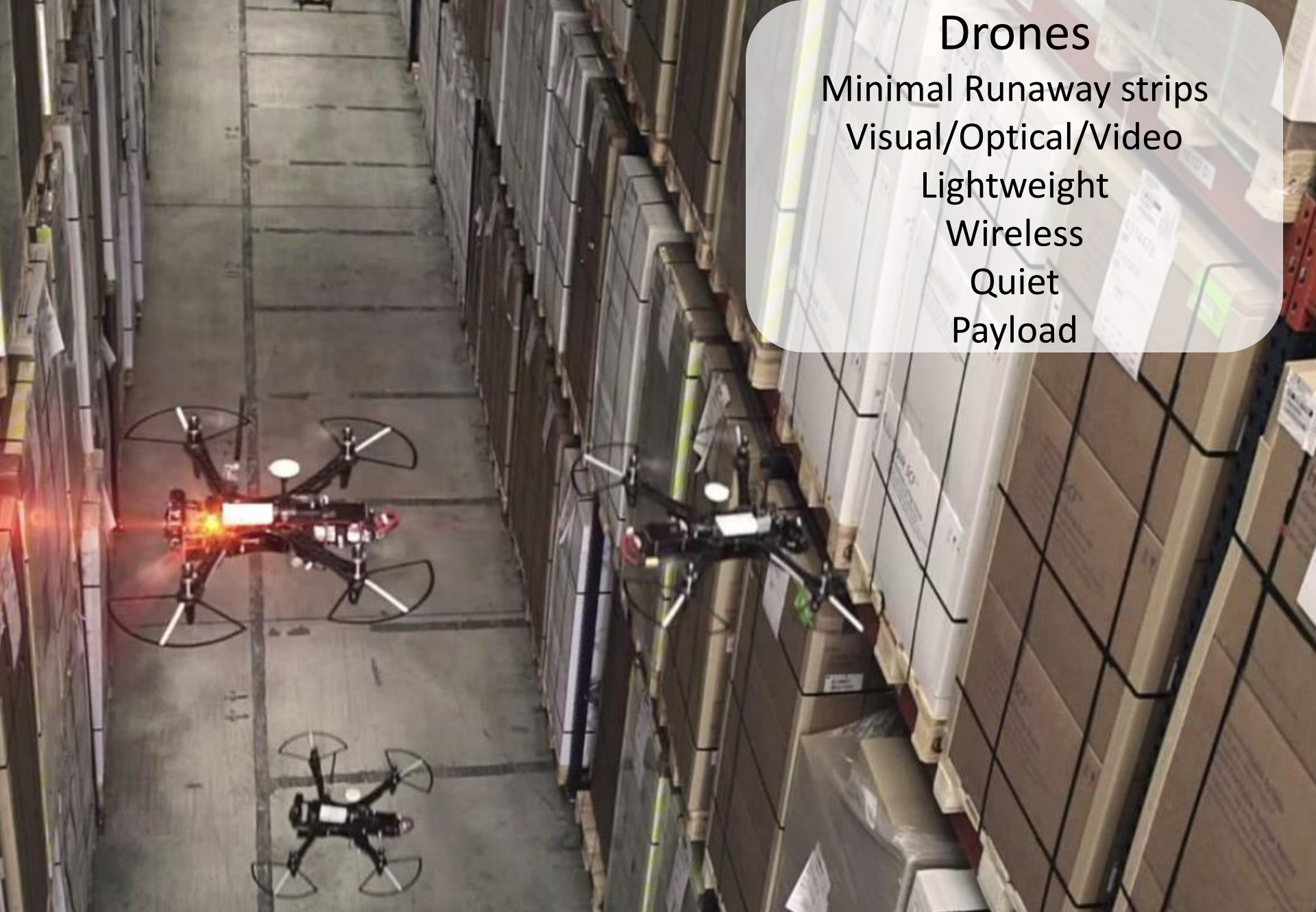
66.9

Guardian graphic

Source: BCG. Note: 2015 to 2025 estimated

📷 The robotics market is expected to be worth \$66.9bn by 2025

Bramsen, M. (2016). Digitalization at Stena Metall. STENA.



Drones

Minimal Runaway strips

Visual/Optical/Video

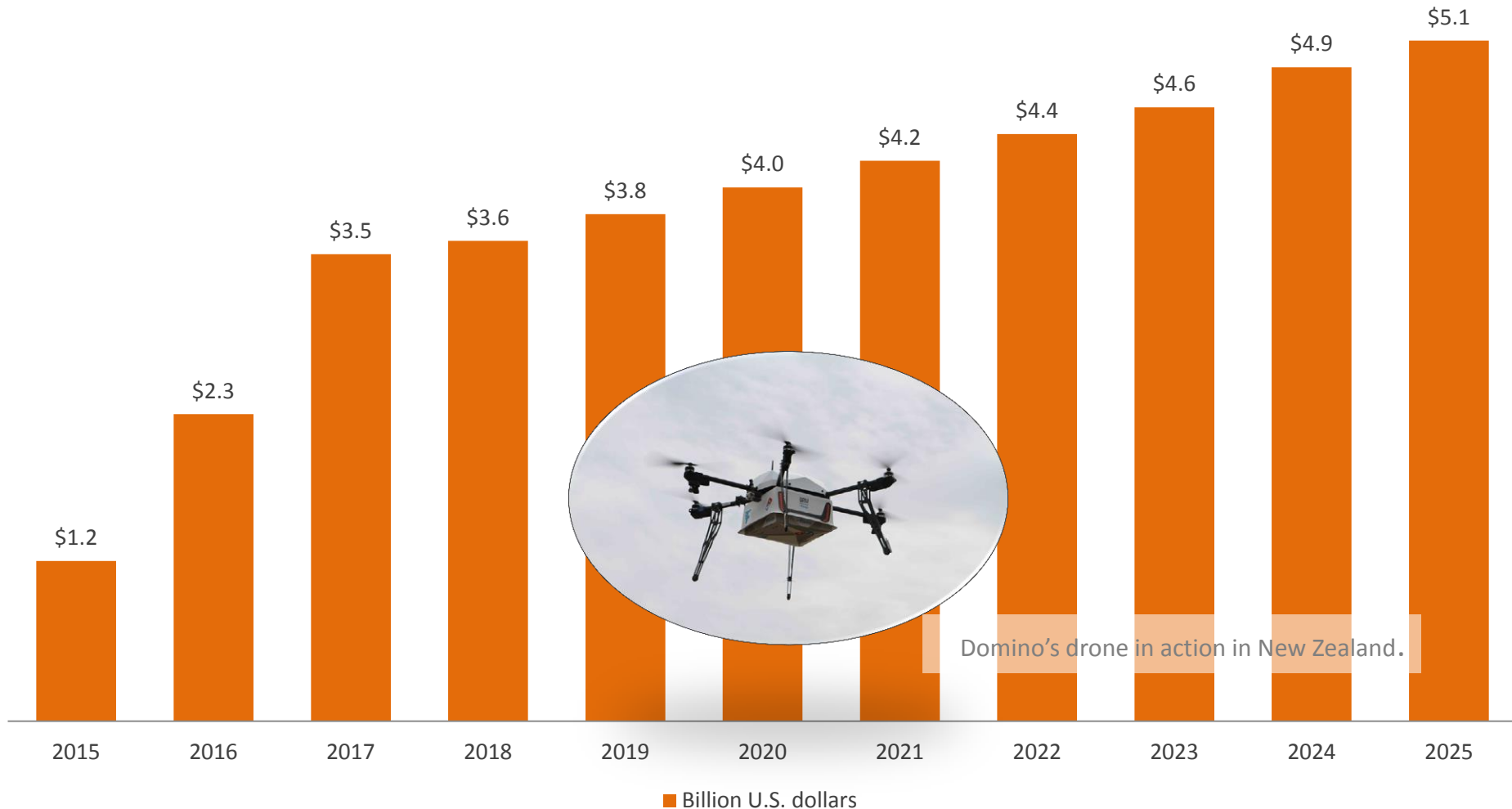
Lightweight

Wireless

Quiet

Payload

Direct Economic Impact from the Commercial Drone Sector in the United States



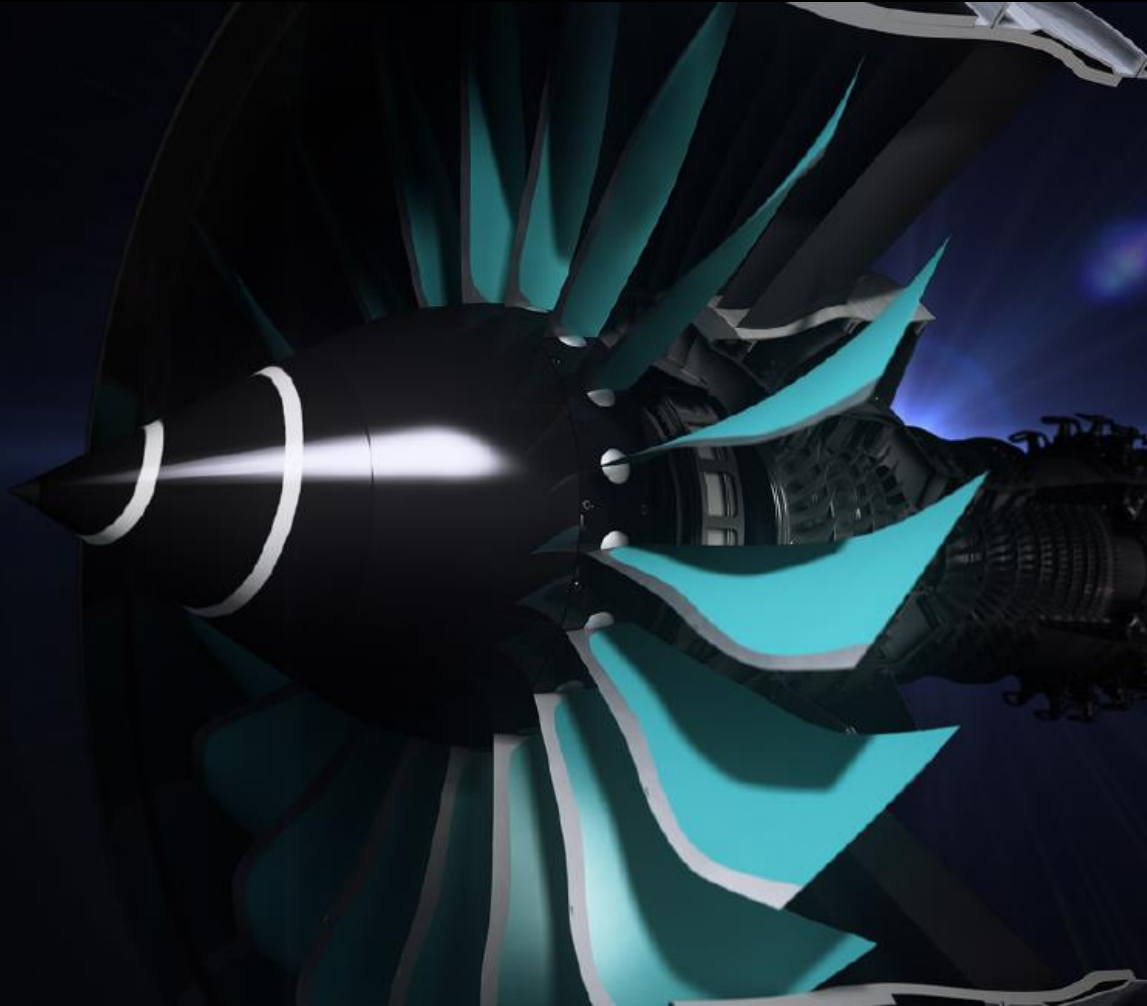
Adapted from Bramsen, M. (2016). Digitalization at Stena Metall. STENA. Source AUVSI

Key Theme 2 - Servitisation

Value shift 2 Product to Service

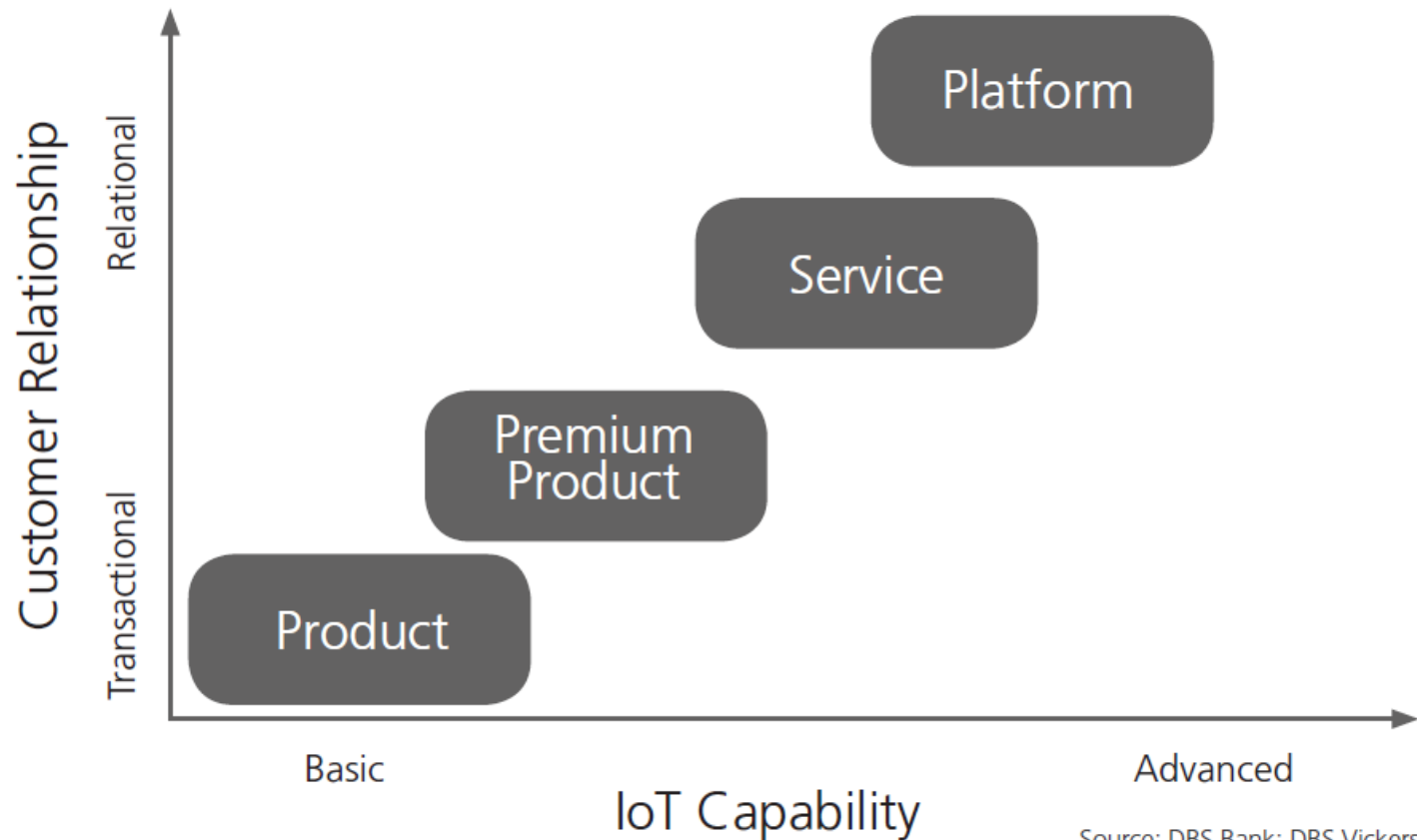
- Value-added services integrated in products
- Service sales during complete product life-cycle
- Product companies becomes service providers

Example: Rolls Royce



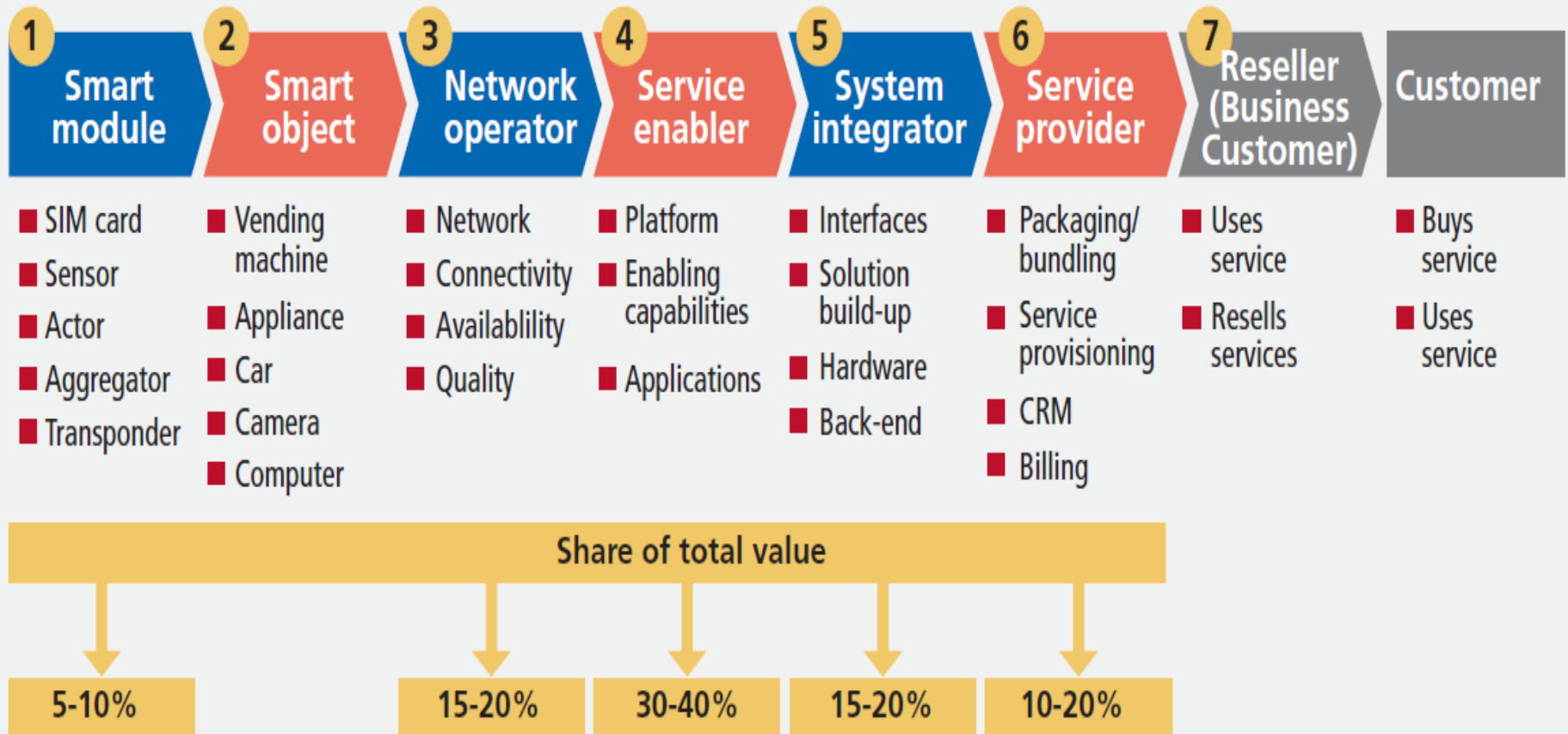
Changing business models

Diagram 3. Business models to shift under IoT



Where is the value?

Diagram 6. How the IoT value chain works



Source: Arthur D Little

Opportunities for new services

IoT enables transition from *Products* to *Services*

Traditional
basketball



Purchase
occasion

*Reactive support
in case of problems with the product*

Connected
basketball



Initial
Purchase

Exercise
download

Share
results

Interactive
coaching

Exercise
download


*Increasing
loyalty/revenues*

Key Theme 3- Design Led

Value Shift 3 Design led

- Leveraging Development Digital technologies
- New models to acquire technology
- Market first, then build



A photograph of a park path. A person in a dark jacket and dark pants is walking away from the camera on a dirt path, carrying a red bag. The path is bordered by green grass and trees. To the right, there is a paved walkway with benches and a black metal fence. In the background, there are more trees and a building. Two white text boxes are overlaid on the image: one on the left with the text 'User experience' and one on the right with the text 'Design'.

User experience

Design

Thank you



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