

Servitisation for the Energy Transition

The value of digitalisation in Product as a Service (PaaS) - scaling energy efficiency, renewables and circularity

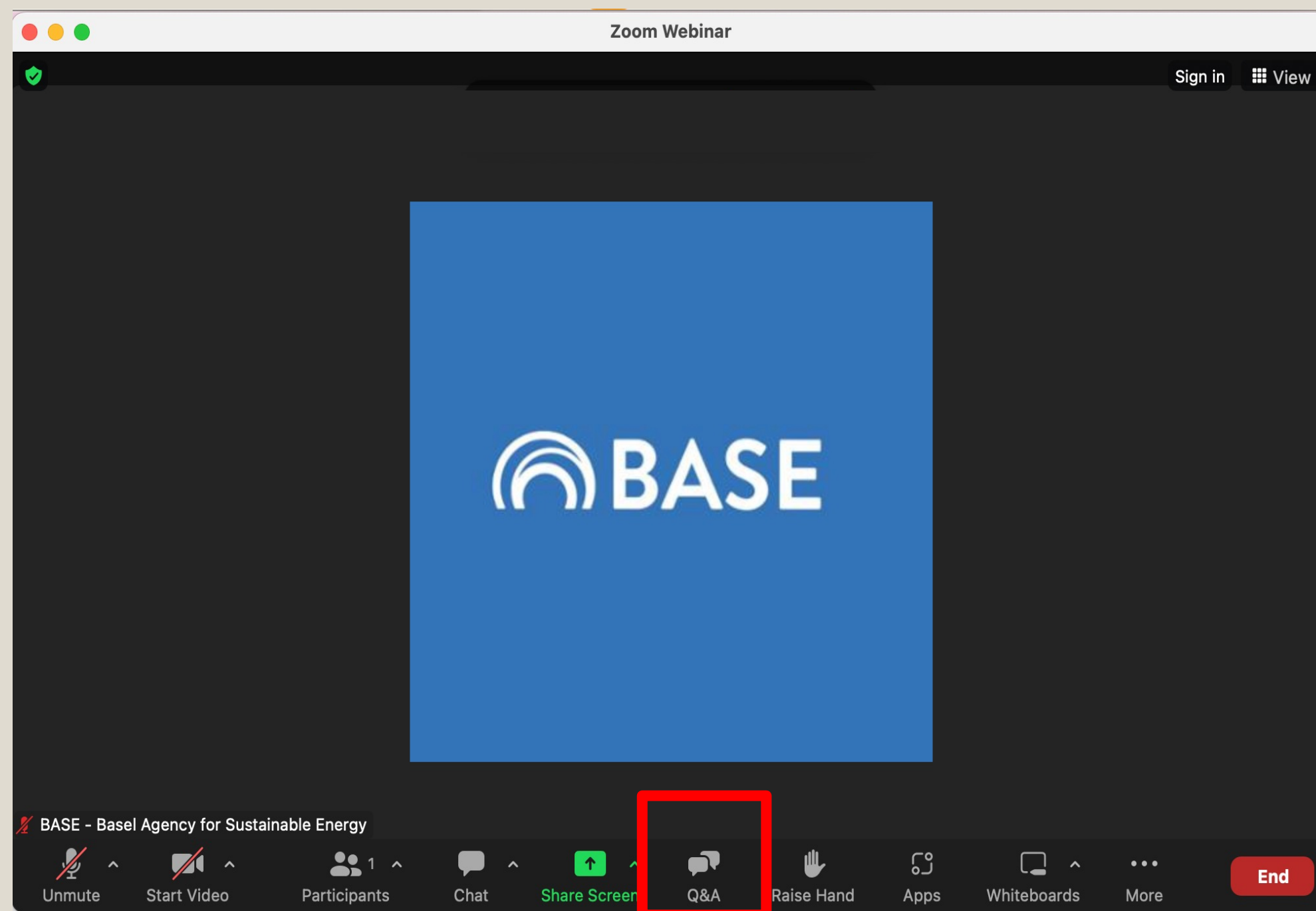
18 June 2024



Webinar

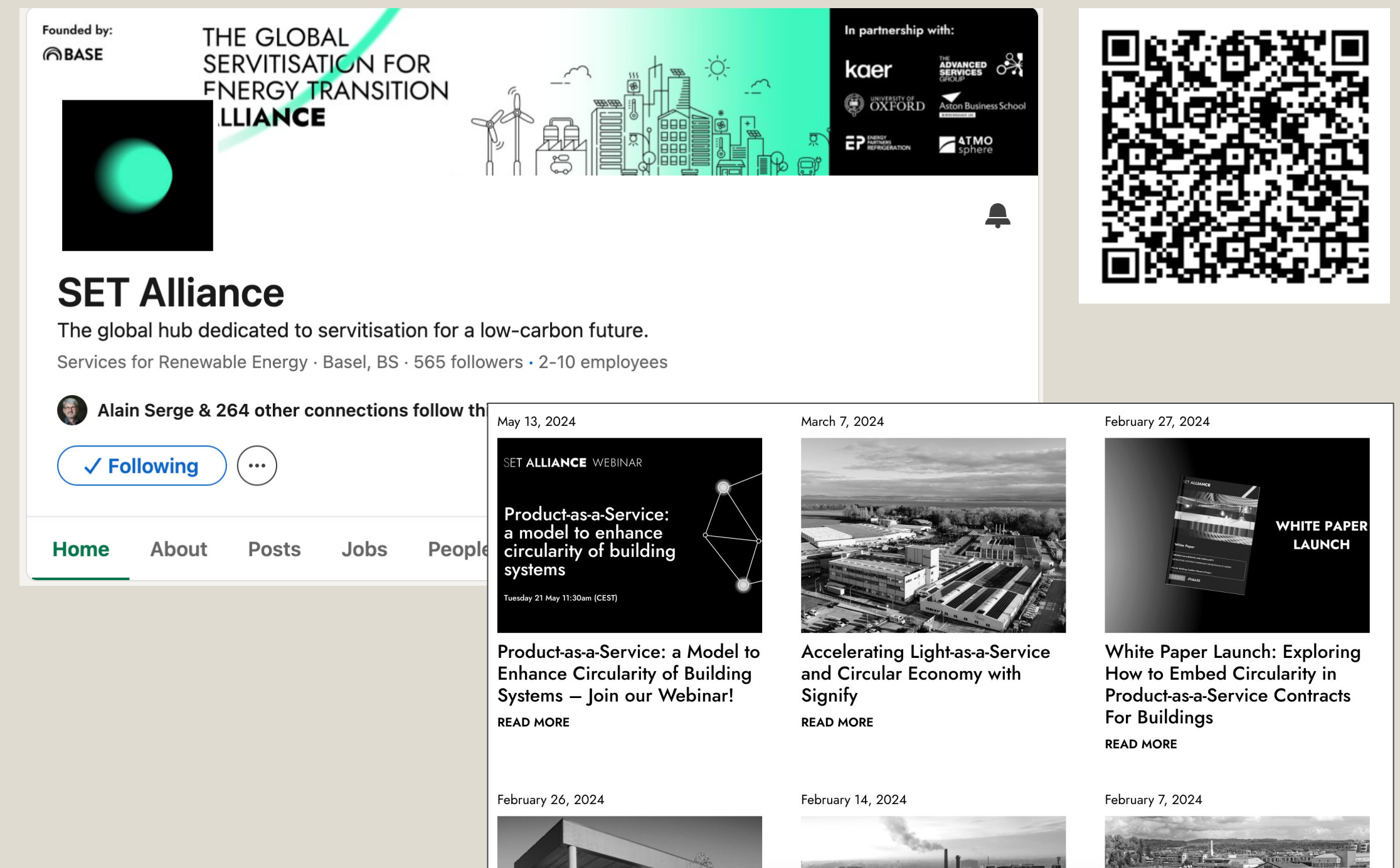
SET ALLIANCE

During the session



- Ask questions
- Write comments

After the session



- Participate in a survey for your feedback on the session
- Follow the SET Alliance on LinkedIn: <https://www.linkedin.com/company/set-alliance/>
- Visit recordings, case studies and articles
- Contact us on info@set-alliance.org

Poll question on Digitalisation

What are the biggest challenges your organization faces in digitalizing servitisation processes?

- A. High implementation costs
- B. Lack of skilled personnel
- C. Data privacy and security concerns
- D. Resistance to change within the organization
- E. Integration with existing systems
- F. All of the above
- G. Other

Our Speakers today



Parikshit Naik
Commercial
Director at the
Advanced Services
Group



Olli Kuismanen
Business Developer at
Tamturbo



Achint Varia
Founder and Chief
Revenue Officer at
Industirity



Dimitris Karamitsos
Sustainable Finance
Team Lead at BASE
Foundation

Steps to Digital Servitisation

Advanced Services Group

We are a **research-led advisory firm** that guides industrial firms to achieve growth through services through advice, training, research and a community of like-minded practitioners. We are purely focused on the **Why, What** and **How** an industrial firm should compete differently through services.



Partnering

Exclusive consortium of leading industrial firms transforming together



Advisory

Customised support to drive your business towards service-led growth



Tools and Frameworks

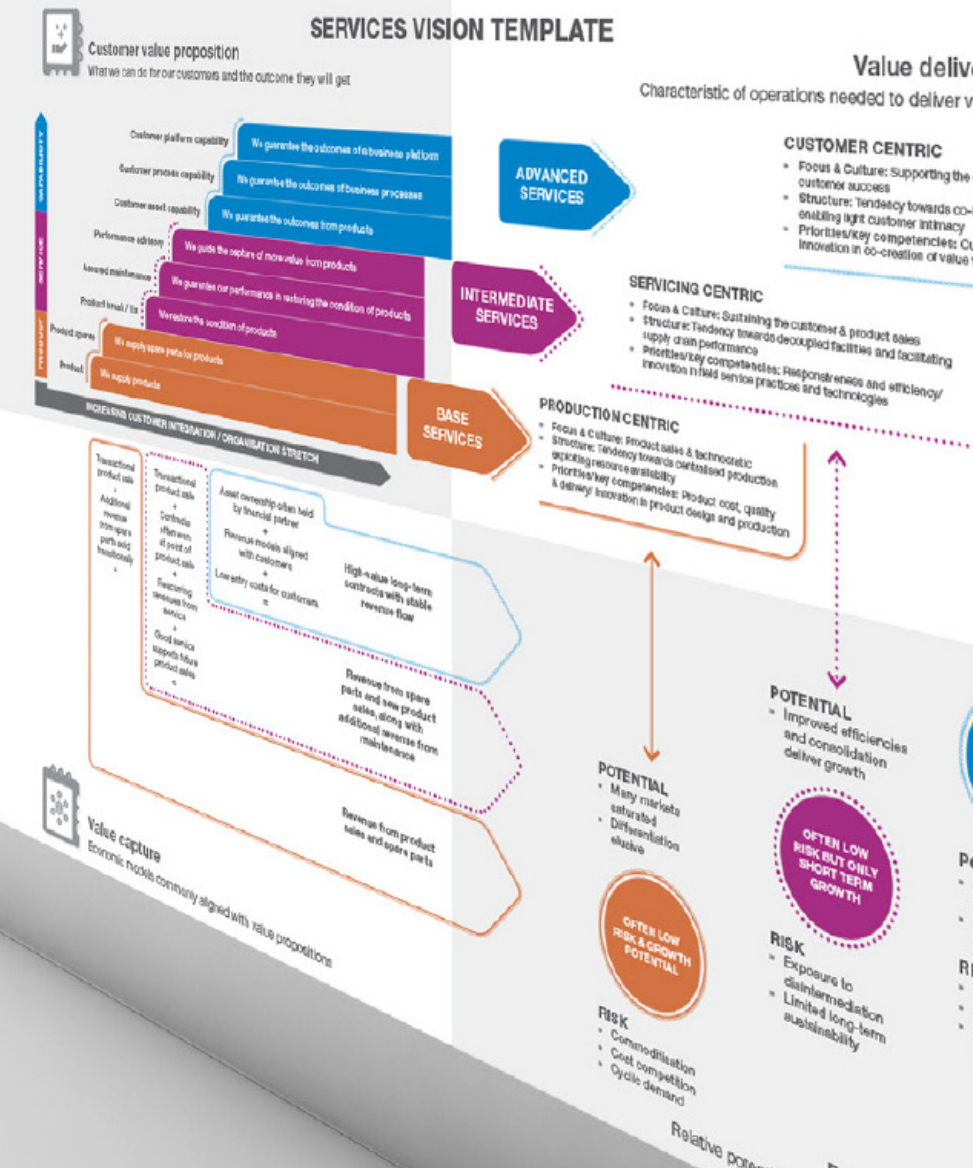
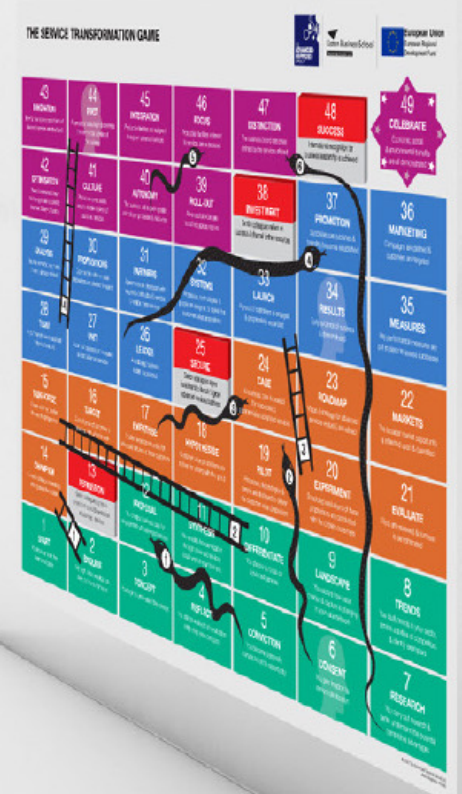
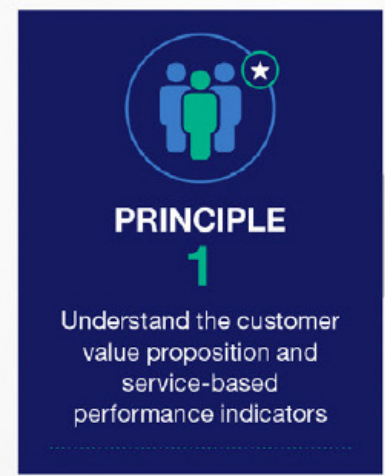
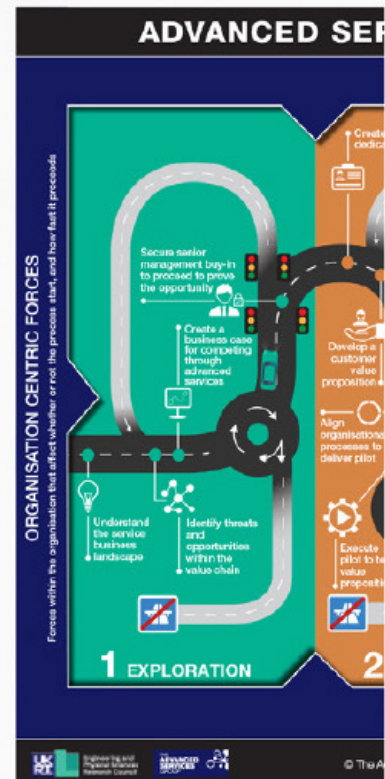
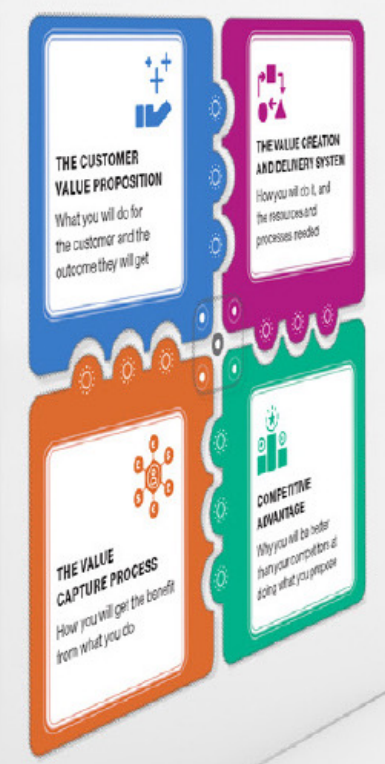
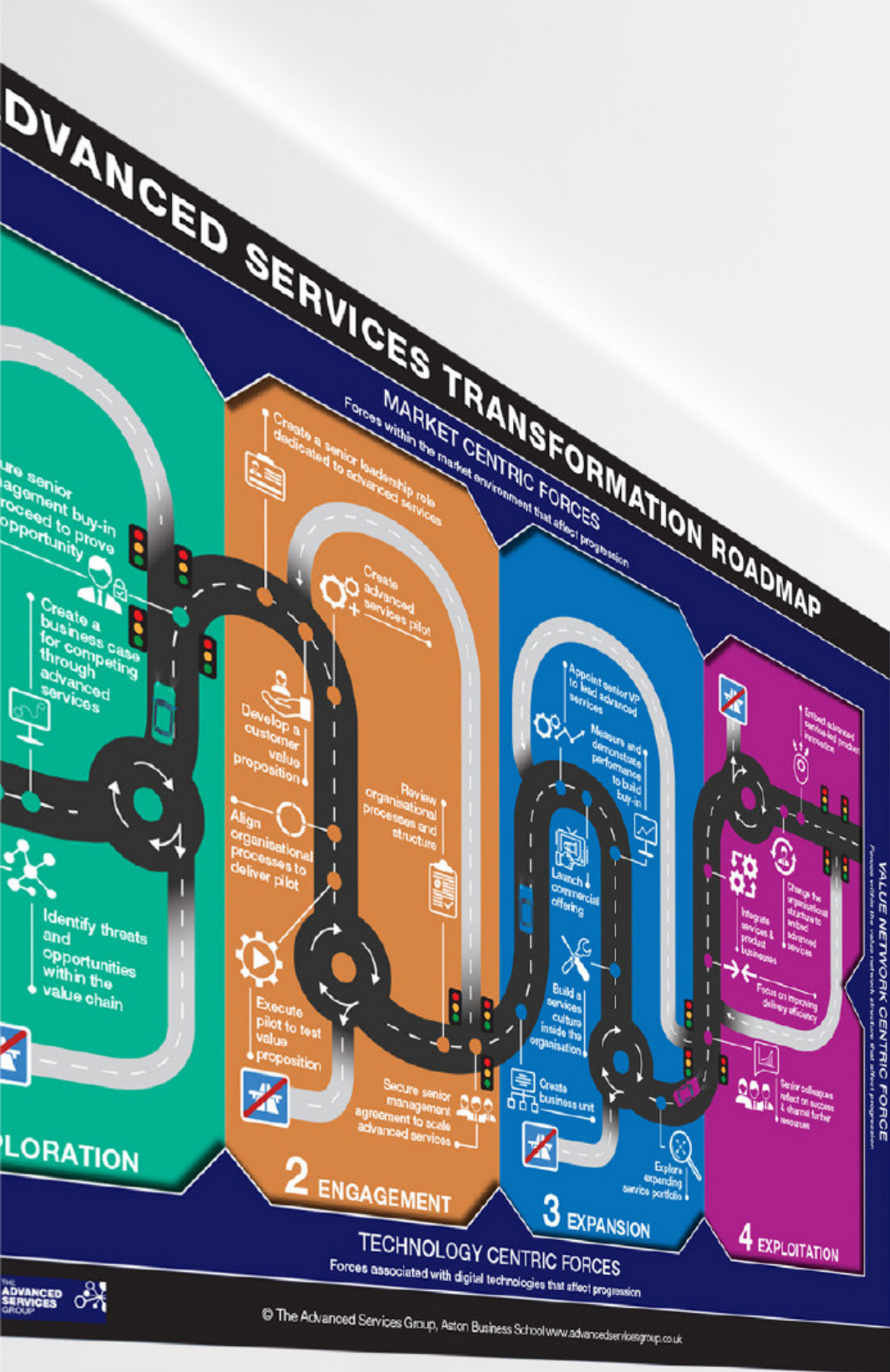
Cutting-edge tools, techniques and frameworks to guide your thinking and decisions



Training

Bootcamps, masterclasses and training to help you and your business compete differently





Our wealth of IP

Our Impact

We have worked with over 450 businesses, of all sizes across different industries, who have both informed and benefited from our Research and Impact.

Our mission: to accelerate the adoption of advanced services within businesses.



Servitization and digitalisation

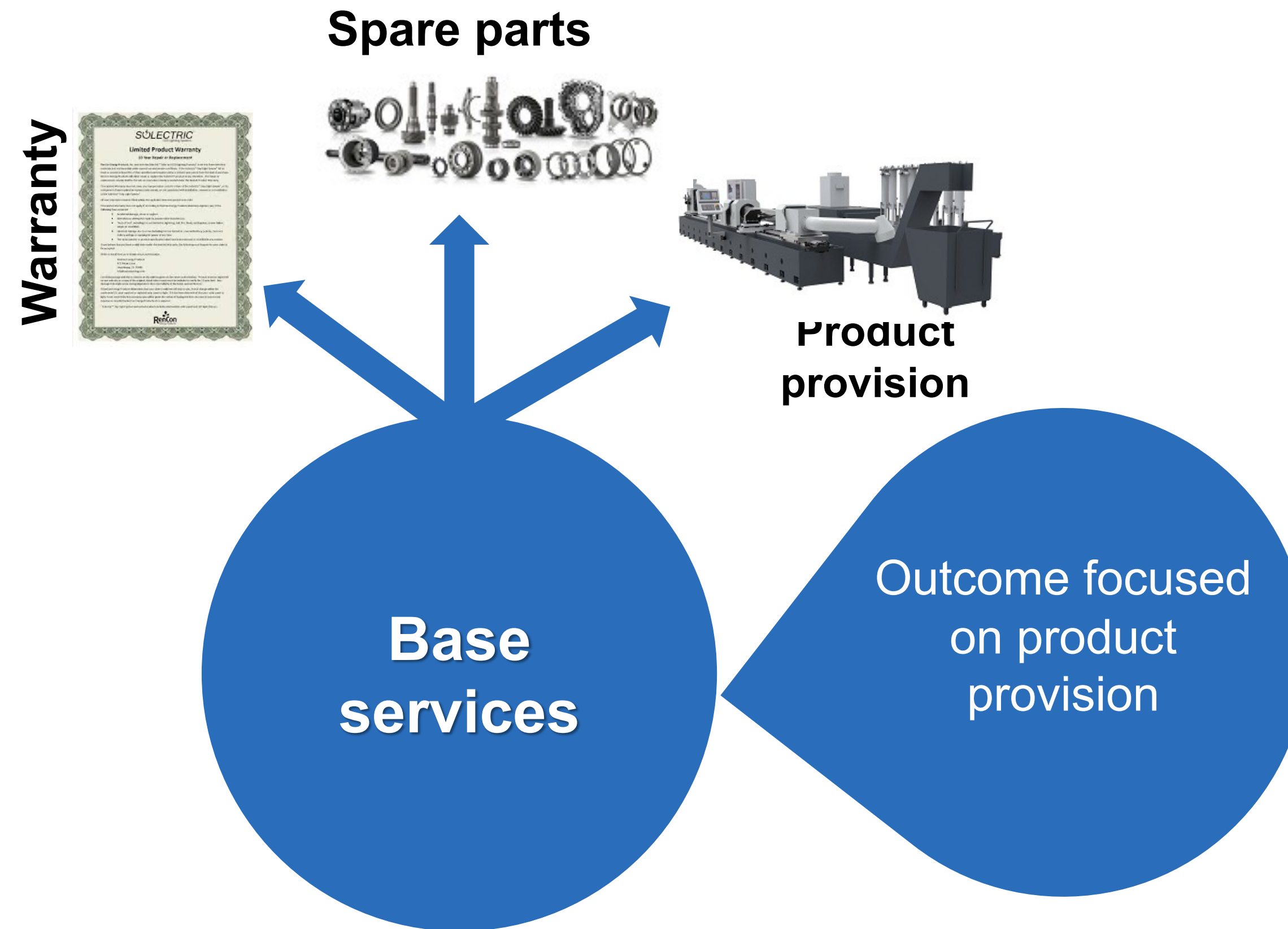


Types of Services

Services
Supporting
Customers



Services
Supporting
Products

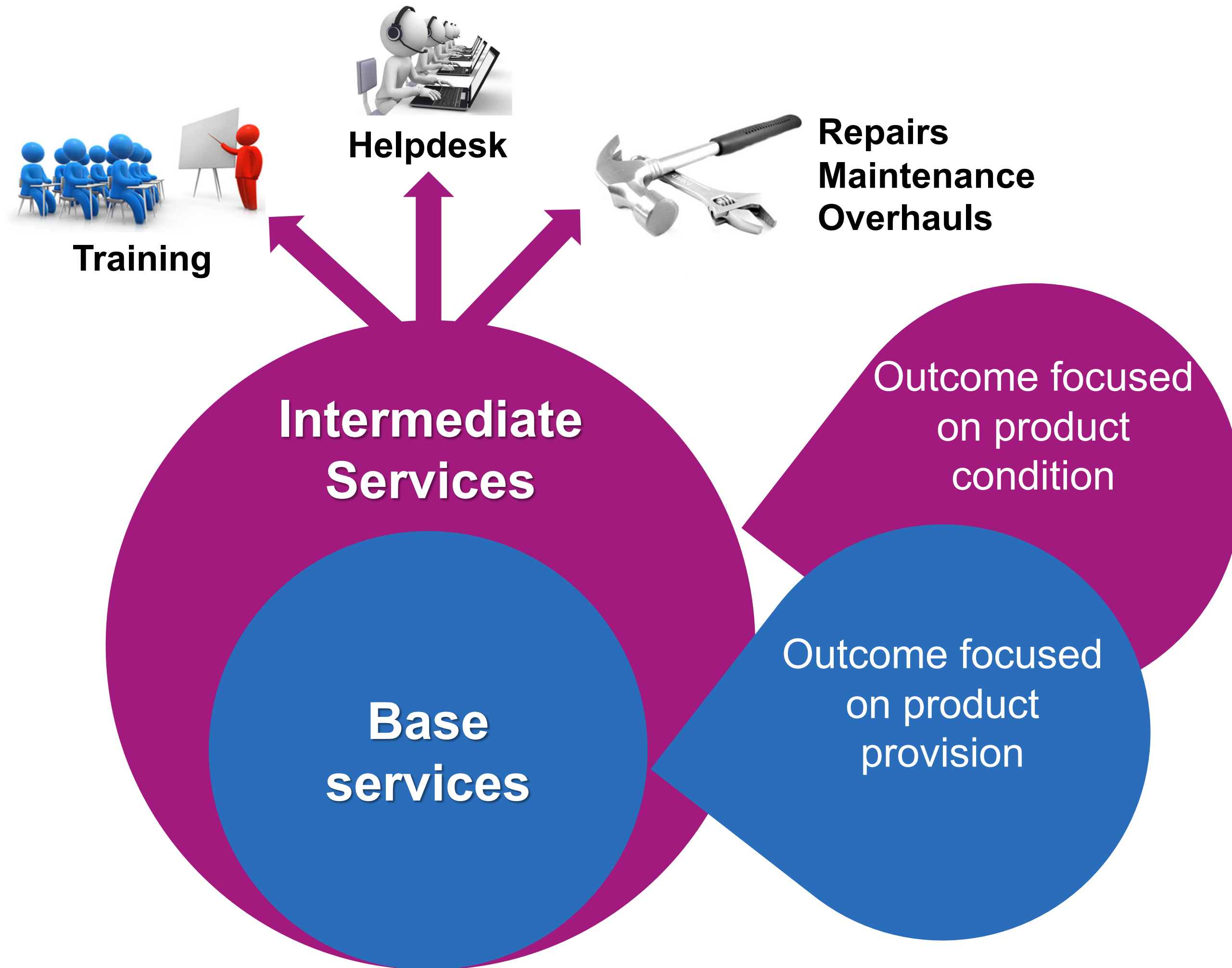


Types of Services

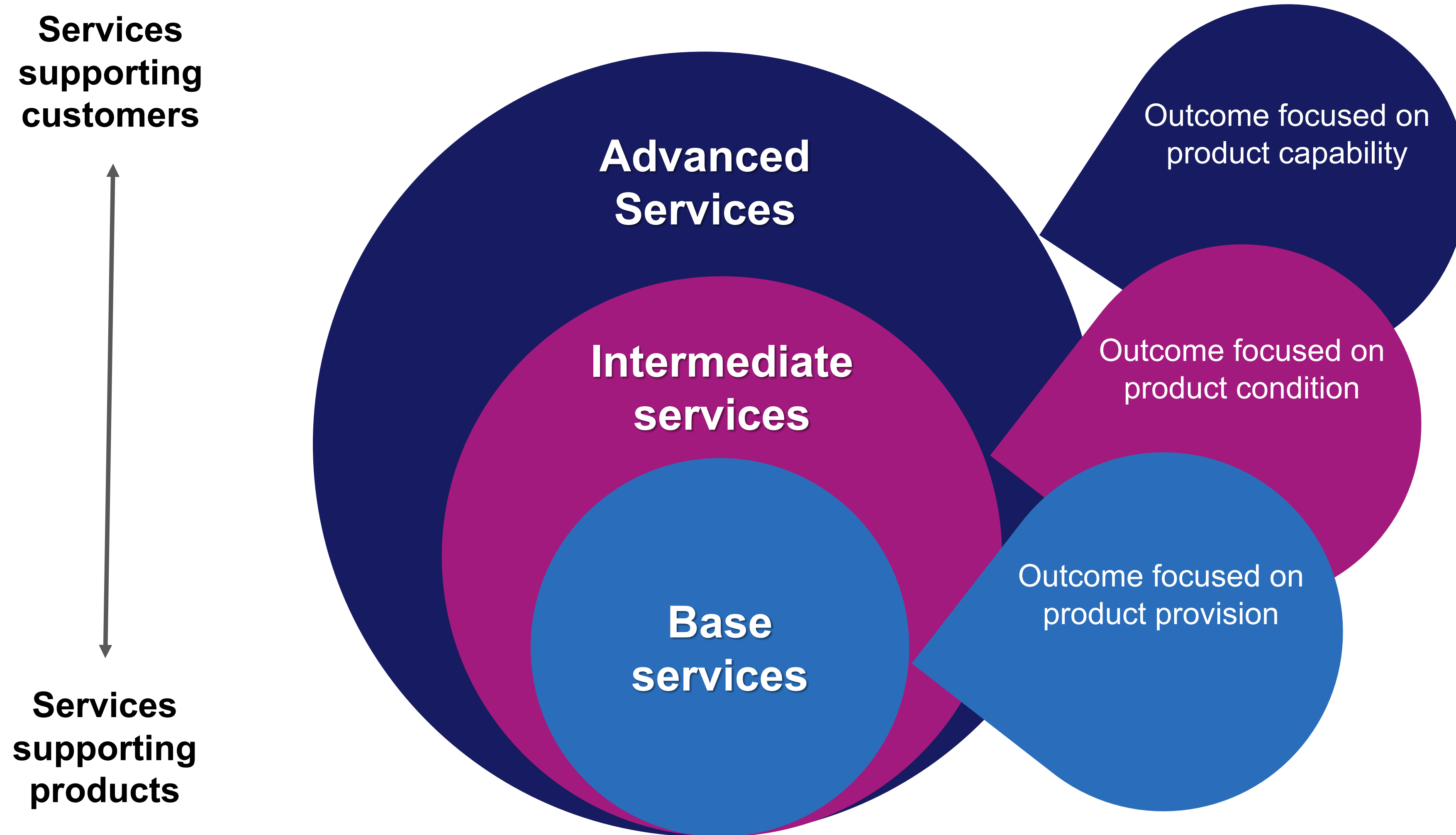
Services Supporting Customers



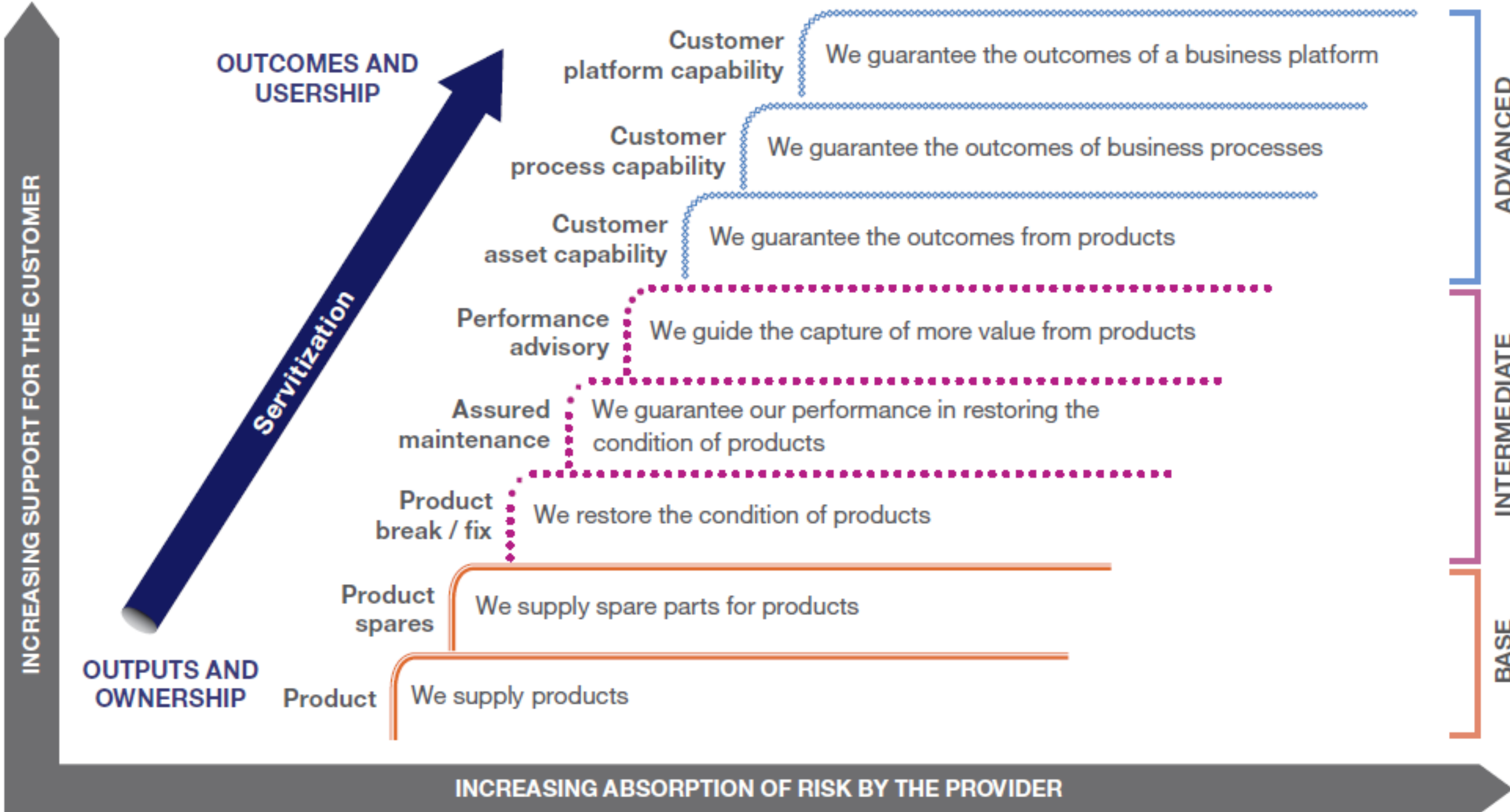
Services Supporting Products



Types of Services




Services Staircase



A new business model

The four Elements of the Business Model:

1 What is the added value you can create for your customers?



THE CUSTOMER VALUE PROPOSITION
What you will do for the customer and the outcome they will get


How do you deliver the added value? **2**



THE VALUE CREATION AND DELIVERY SYSTEM
How you will do it, and the resources and processes needed



3 How do you capture the value back to your business?



THE VALUE CAPTURE PROCESS
How you will get the benefit from what you do

Why are you best placed to do this? **4**



COMPETITIVE ADVANTAGE
Why you will be better than your competitors at doing what you propose



Tamturbo's Journey to Servitisation

Selling value instead of equipment

Touch-Free™
Oil-Free Carbon-Free Care-Free

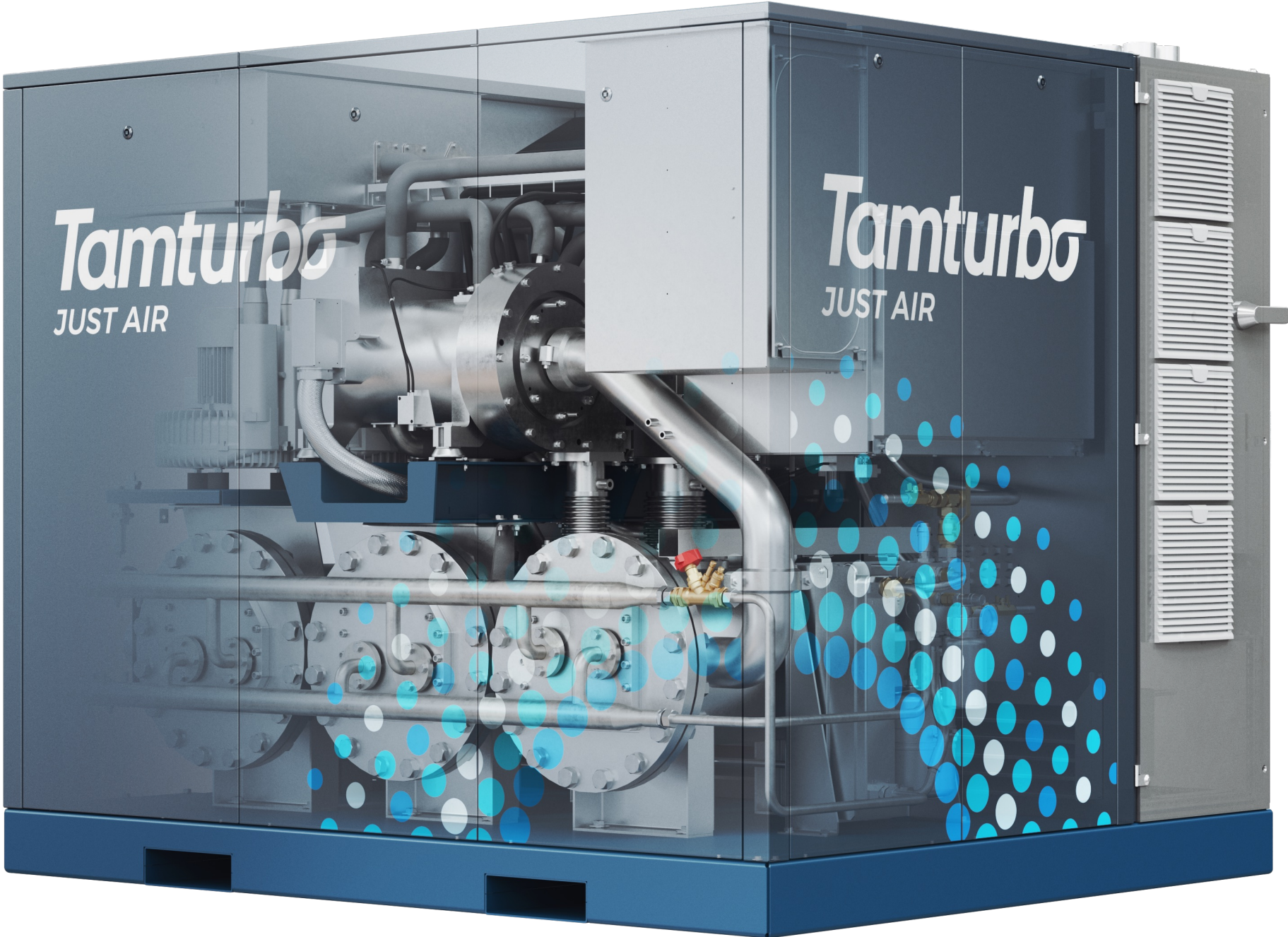
Compressed air (and waste heat) as-a-Service

Olli Kuismanen
Tamturbo Plc

Tamturbo
JUST AIR



Starting point – new tech to solve customer need



Oil-free compressed air
Sustainability improvements

Chemical & Petrochemical



Food & Beverage



Electronics



Pharmaceutical & Medical



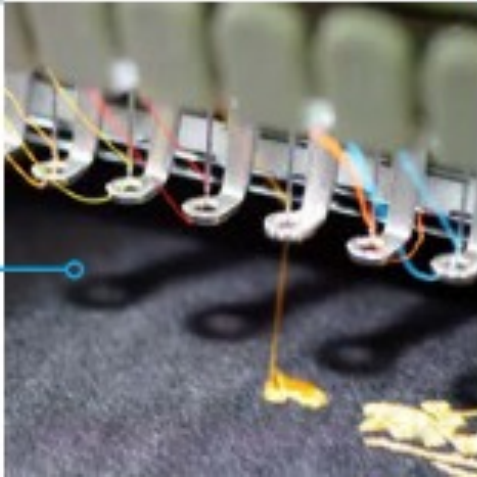
Manufacturing



Automotive



Textile



Pulp & Paper



INCREASING POTENTIAL FOR VALUE CREATION



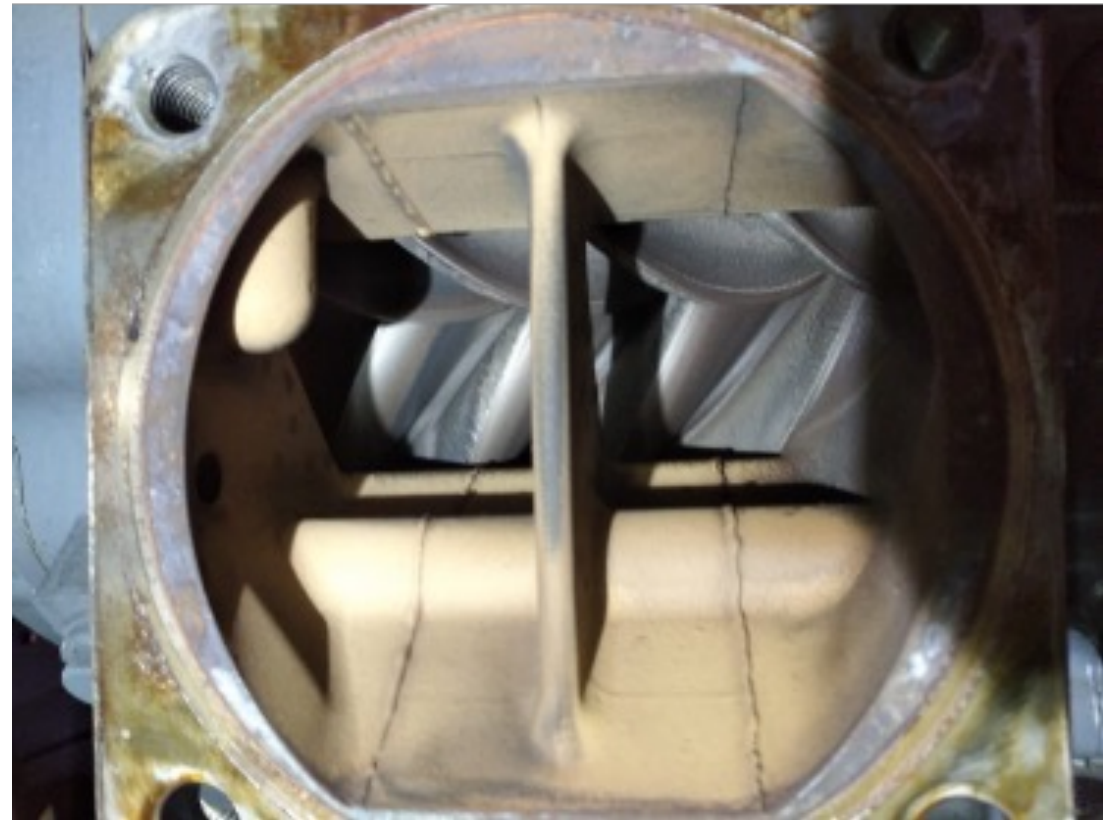
POTENTIAL FOR COMPETITIVE ADVANTAGE THROUGH THE ABSORPTION OF RISK




Our challenge in traditional CAPEX business model

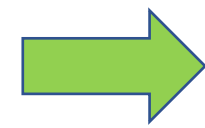
- Very high technology COGS cost (3x)
- Very low service revenue (-90%)
- New technology in a conservative market



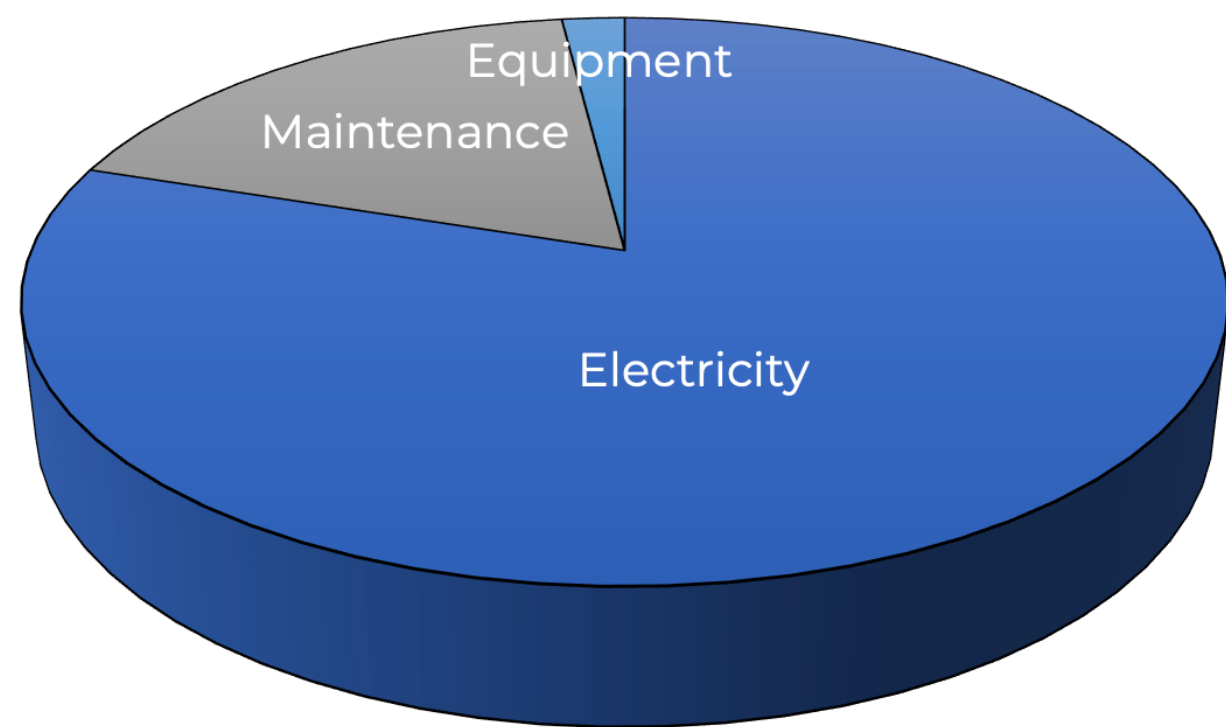
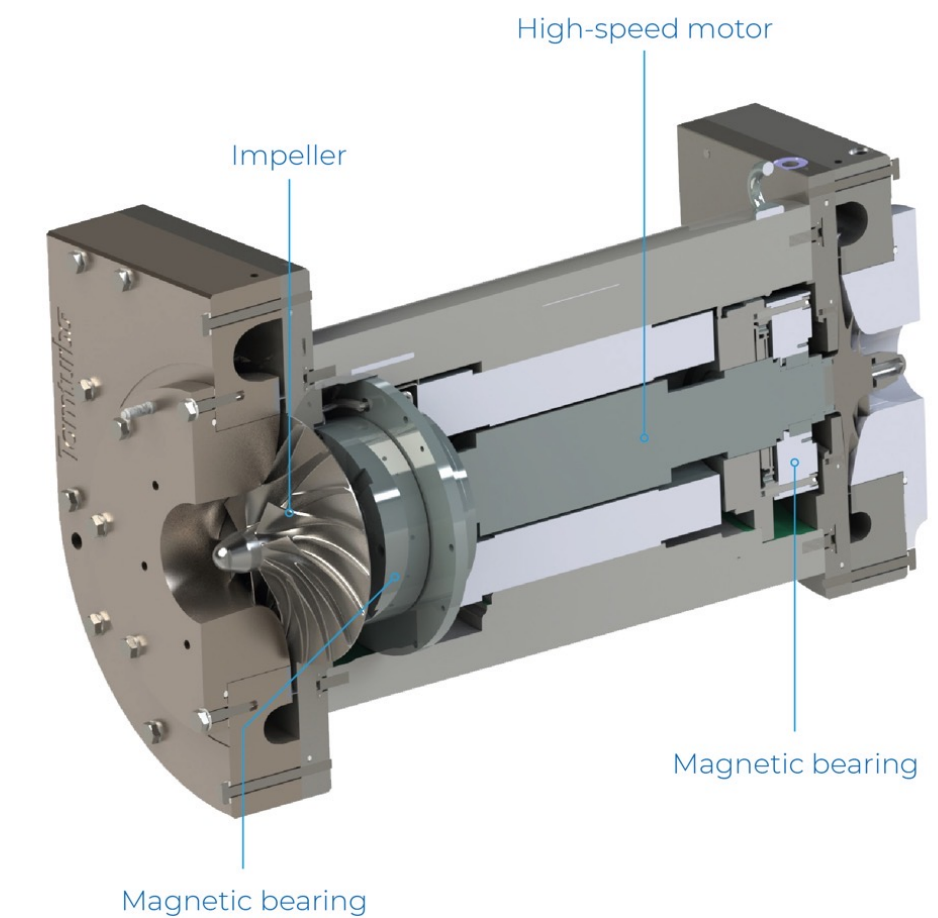
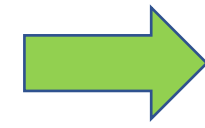
Legacy technology 50+ years old - inexpensive
 Requires (permits) maintenance (revenue & profit)
 Loses energy



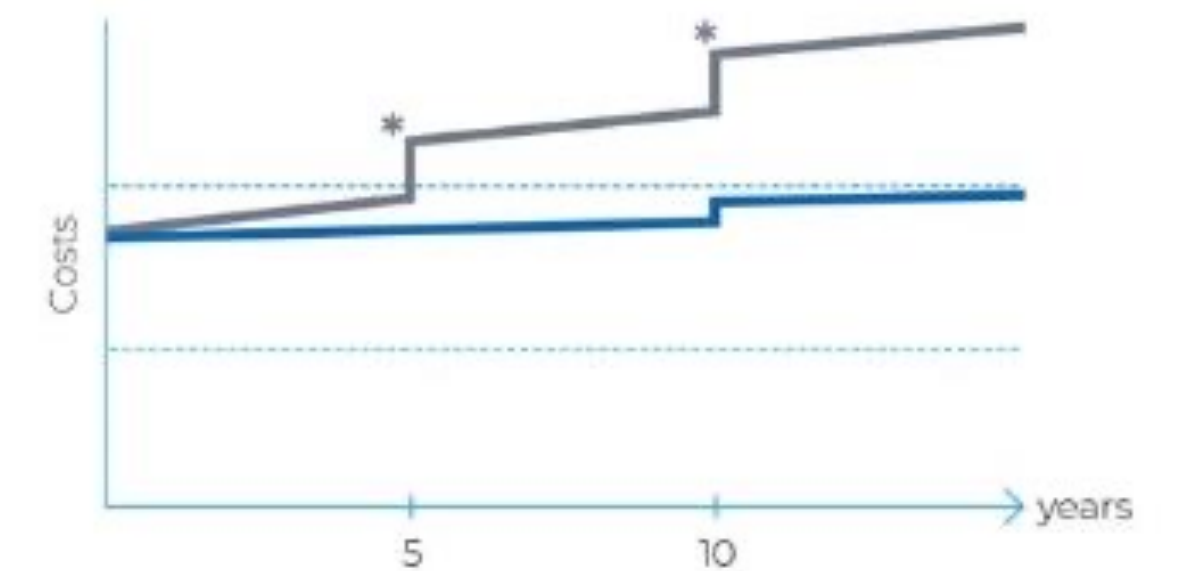
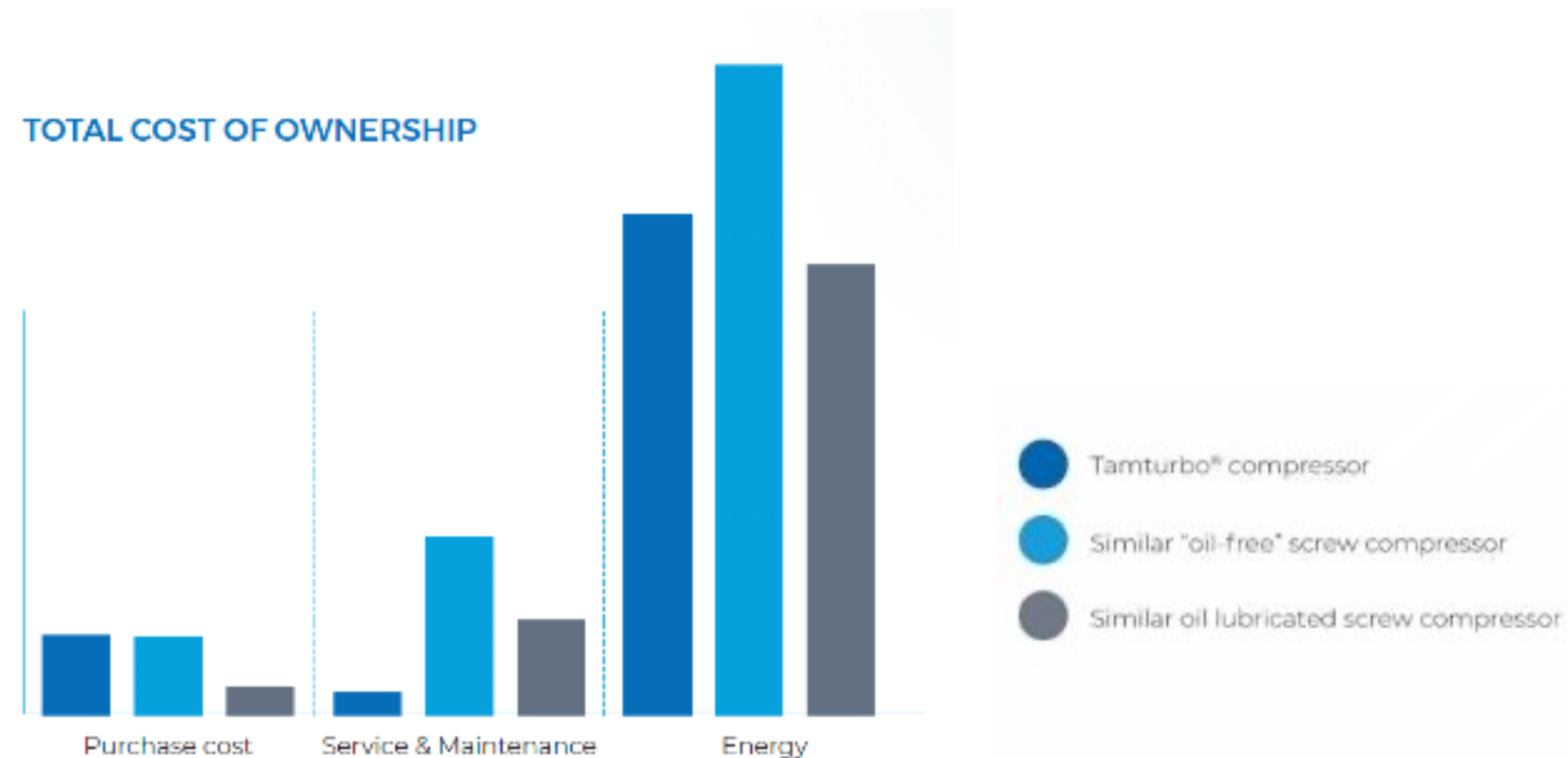
-  Requires oil
-  High maintenance
-  Efficiency loss



Technology shift to high-speed turbo



TOTAL COST OF OWNERSHIP



90% less maintenance

Oil-free screw: typical service plan for 10 years

Maintenance schedule	Visit Type	Labor, hours	Activities	Visit I	Visit F	1 year		2 year		3 year		4 year		5 year		6 year		7 year		8 year		9 year		10 year			
						A	B	A	C	A	B	A	C	A	D	A	B	A	C	A	B	A	C	A	C	A	E
						4	12	4	48	4	12	4	48	4	56	4	12	4	48	4	12	4	48	4	48	4	68
						Running Hours	4000	8000	12000	16000	20000	24000	28000	32000	36000	40000	44000	48000	52000	56000	60000	64000	68000	72000	76000	80000	
1	Take service reading (air, oil, waterT+P)	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•			
2	Check coolers functions	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•			
3	Check for air- water- & oil leakage	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•			
4	Check sensitive bolt/cpling connections	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•			
5	Check/adjust safety valve+switches	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•			
6	Check for presence of water in lube oil	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•			
7	Change compressor oil			•																							
8	Change compressor oil filter			•		•		•		•		•		•		•		•		•		•		•			
9	Check condition of air intake chamber	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•			
10	Check air filter element(s)	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•			
11	Inspect/change air filter element(s)			•		•		•		•		•		•		•		•		•		•		•			
12	Check filter elmt of gear case breather	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•			
13	Replace filter elmt:gear case breather	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•			
14	Check cycle of air intake throttle valve	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•			
15	Replace diaphragm of air throttle valve			•		•		•		•		•		•		•		•		•		•		•			
16	Replace bearing block (air intake valve)			•		•		•		•		•		•		•		•		•		•		•			
17	Check motor (coupling) alignment			•		•		•		•		•		•		•		•		•		•		•			
18	Overhaul air intake valve			•		•		•		•		•		•		•		•		•		•		•			
19	Replace blow-off silencer			•		•		•		•		•		•		•		•		•		•		•			
20	Check functioning of check valve			•		•		•		•		•		•		•		•		•		•		•			
21	Overhaul check valve			•		•		•		•		•		•		•		•		•		•		•			
22	Check condition: balance piston diaphragm			•		•		•		•		•		•		•		•		•		•		•			
23	Change balance piston diaphragm			•		•		•		•		•		•		•		•		•		•		•			
24	Check/clean condensate drain(s)	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•			
25	Grease main drive motor bearings			•		•		•		•		•		•		•		•		•		•		•			
26	Clean fan cowl of electric motor			•		•		•		•		•		•		•		•		•		•		•			
27	Overhaul main drive motor			•		•		•		•		•		•		•		•		•		•		•			
28	Clean cooler block (int/ext)	•		•		•		•		•		•		•		•		•		•		•		•			
29	Check rubber inserts, drive coupling			•		•		•		•		•		•		•		•		•		•		•			
30	Replace inserts, drive coupling			•		•		•		•		•		•		•		•		•		•		•			
31	Check condition of drive gear teeth			•		•		•		•		•		•		•		•		•		•		•			
32	Replace LP/HP element			•		•		•		•		•		•		•		•		•		•		•			
33	Replace main shaft bearings			•		•		•		•		•		•		•		•		•		•		•			
34	Replace rubber buffers			•		•		•		•		•		•		•		•		•		•		•			
35	Take full set of S.P.M. readings	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•			
36	Blastclean cubicle			•		•		•		•		•		•		•		•		•		•		•			
37	Check loose wiring & connections cubicle			•		•		•		•		•		•		•		•		•		•		•			
38	Replace carbon brush			•		•		•		•		•		•		•		•		•		•		•			
39	Replace converter fan (32.000-40.000 hrs)			•		•		•		•		•		•		•		•		•		•		•			
40	Overhaul oil pump			•		•		•		•		•		•		•		•		•		•		•			



Tamturbo typical service plan* for 10 years

*Maintenance intervals are provided only for comparison purpose.

*Actual maintenance for Tamturbo compressors is condition based and may come later than recommended.

Maintenance and Service Items	TAMTURBO MAINTENANCE AND SERVICE SCHEDULE *					
	<i>maintenance activities are condition based</i>					
	typically after ->	>6 mon	>1-2 yrs	>3 yrs	>5 yrs	>10 yrs
Check/Clean Electrical Cabinet	check	•				
Check/Clean Electrical Cabinet Filters	check	•				
Check/Clean Enclosure Filters	check	•				
Check/Clean Motor Cooling Fan Filter	check	•				
Check/Clean Compressor	check	•				
Check E-Stop Function	check	•				
Service Condensate Drains Seals	service		•			
Inspect/Replace Air Filters	service		•			
Service Proport. & Blow-Off Valve Seals	service			•		
Service Discharge Check Valve Seals	service			•		
Inspect/Replace VSD Cooling Fans	service				•	
Replace Internal Cooling Liquid	service				•	
Inspect/Replace Cooling Circuit Pump and Blower	service				•	
Inspect/Replace Heat Exchanger Seals	service					•
Service VSD / Magnetic Bearing Controller / Sine Filter Capacitors	service					•



Our opportunity

- Clearly the lowest TCO
- Valuable “waste” heat available
- -as-a-Service business model to capture added value

Digital Servitisation made real



Leading Digital Servitization Solution for Manufacturers

Our modular SaaS software with IoT and Generative AI along with consulting services delivers an accelerated journey for machine manufacturers to growing their aftersales revenue and scaling servitization.

27+

Apps

3000+

Connected



SaaS Software

100K+

Assets

2018

Established

Founders with 25+ years of experience from



Top brands in these industries trusts us

Boilers

HVAC

Printing

Packaging

Construction

Material Handling

Milling

Hydrogen Fuel

Oil and Gas

and more...

Technology partners we work with



OpenAI



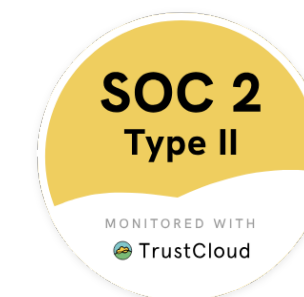
Microsoft



serverless



SORACOM
You create. We connect.



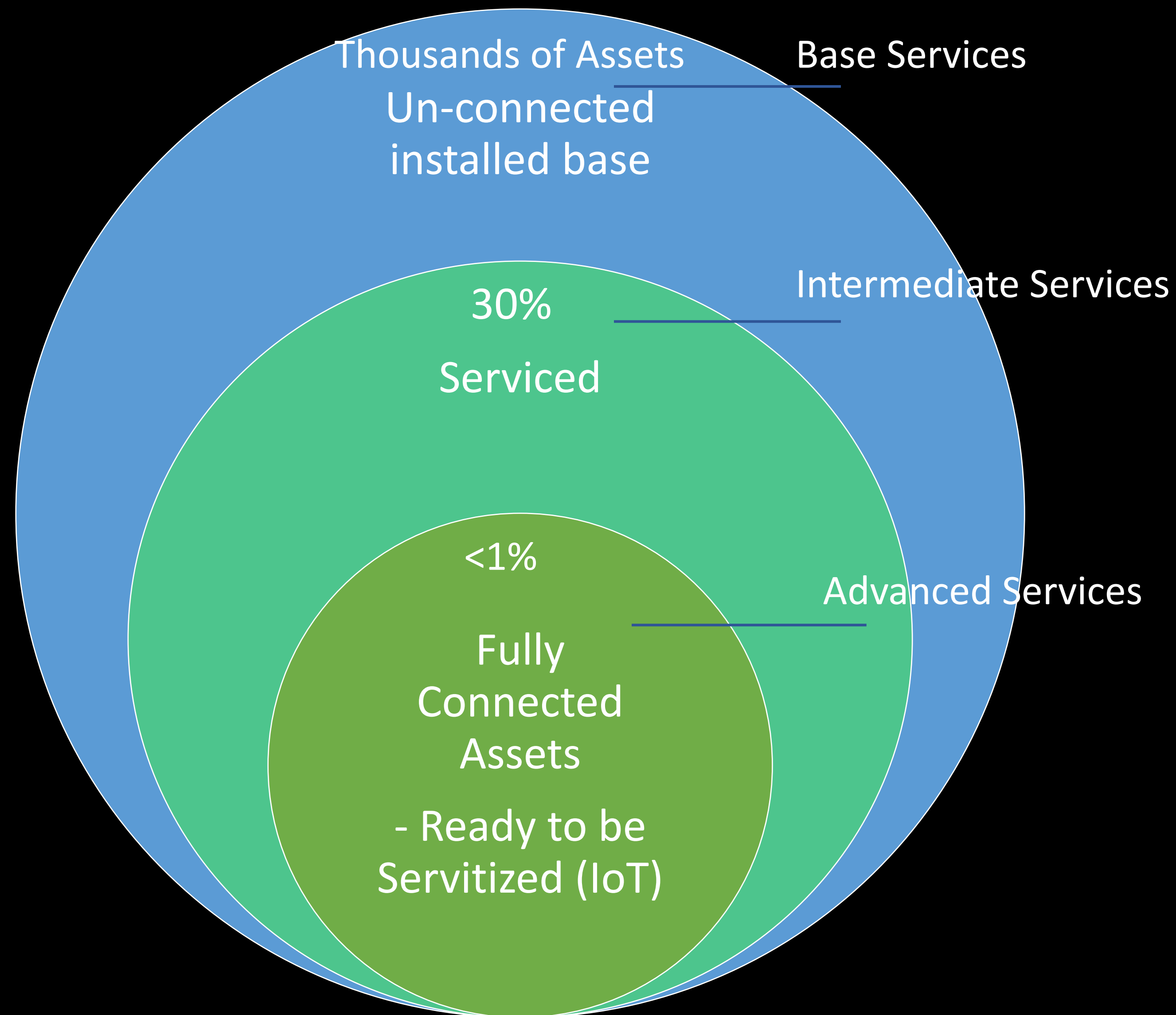
Increase the BASE and INNOVATE Faster

Manufacturers

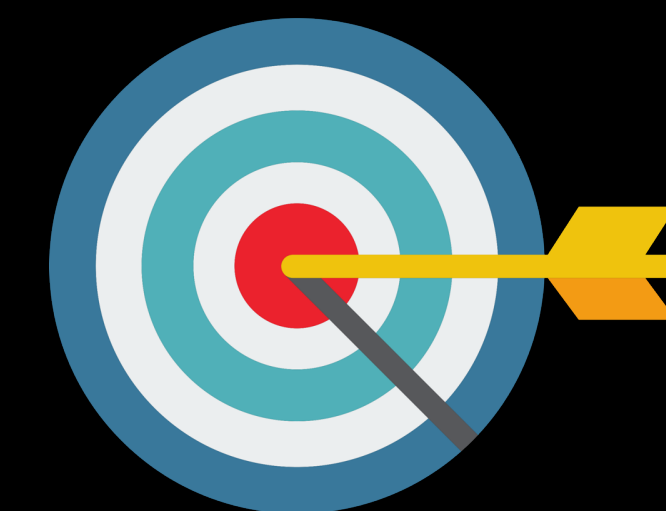


Money

Increase in Volume



Customers



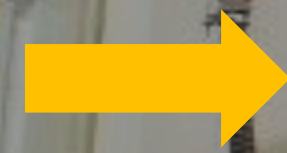
Outcome

Increase in Value



Supply

- Machinery



Industrial Chiller



Outcomes

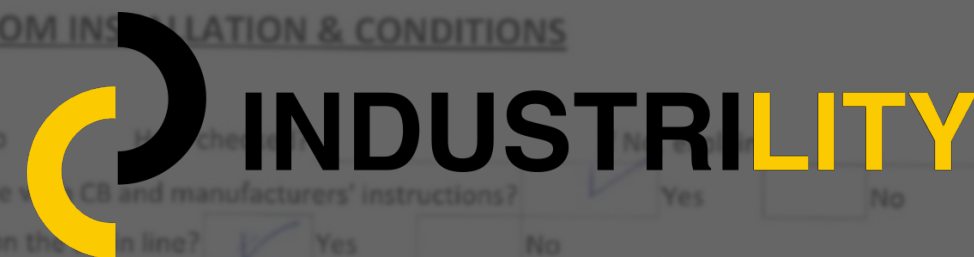
- Cooling
- Low TCO
- Uptime
- Peace of mind

Input

- Energy/Fuel
- Consumables



Data and Technology as an enabler



Carbon Footprint
Alerts Sensors
GPS Location

Telematics

First owner 2nd owner Distributors

Customers

Modbus
SIM
OTA

Connectivity

s/n: 1234
My Asset

Certifications
courses

Training

Maintenance

Inspections
Repair
Scheduled

Parts

Components
Consumables
Accessories

ordering
reminders

history

AEC
3D
2D

Design

Static Data

Manuals
Brochures
Videos

Operational
documents

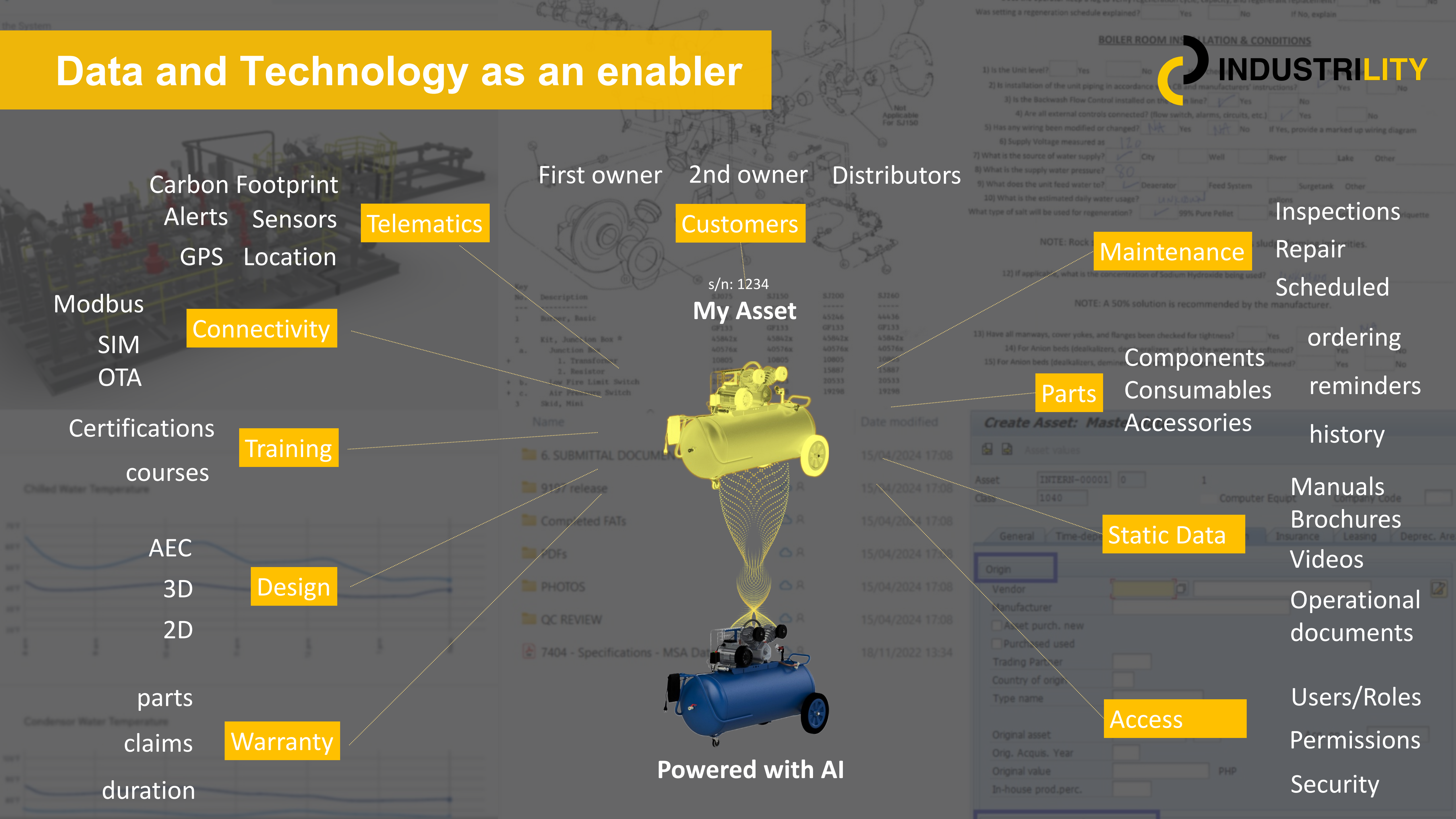
parts
claims
duration

Warranty

Access

Users/Roles
Permissions
Security

Powered with AI



BOILER ROOM INSULATION & CONDITIONS

1) Is the Unit level? Yes No

2) Is installation of the unit piping in accordance with CB and manufacturers' instructions? Yes No

3) Is the Backwash Flow Control installed on the in line? Yes No

4) Are all external controls connected? (flow switch, alarms, circuits, etc.) Yes No

5) Has any wiring been modified or changed? Yes No If Yes, provide a marked up wiring diagram

6) Supply Voltage measured as

7) What is the source of water supply? City Well River Lake Other

8) What is the supply water pressure?

9) What does the unit feed water to? Deaerator Feed System Surgetank Other

10) What is the estimated daily water usage? gallons

What type of salt will be used for regeneration? 99% Pure Pellet Other

NOTE: Rock salt is not recommended for use in this application.

12) If applicable, what is the concentration of Sodium Hydroxide being used? %

NOTE: A 50% solution is recommended by the manufacturer.

13) Have all manways, cover yokes, and flanges been checked for tightness? Yes No

14) For Anion beds (dealkalizers, demineralizers, etc.) is the water being softened? Yes No

15) For Anion beds (dealkalizers, demineralizers, etc.) is the water being softened? Yes No

Create Asset: Master

Asset values

Asset: 0 1

Class: Computer Equip

General Time-dep Insurance Leasing Deprec. Are

Origin

Vendor:

Manufacturer

Asset purch. new

Purchased used

Trading Partner

Country of origin

Type name

Original asset

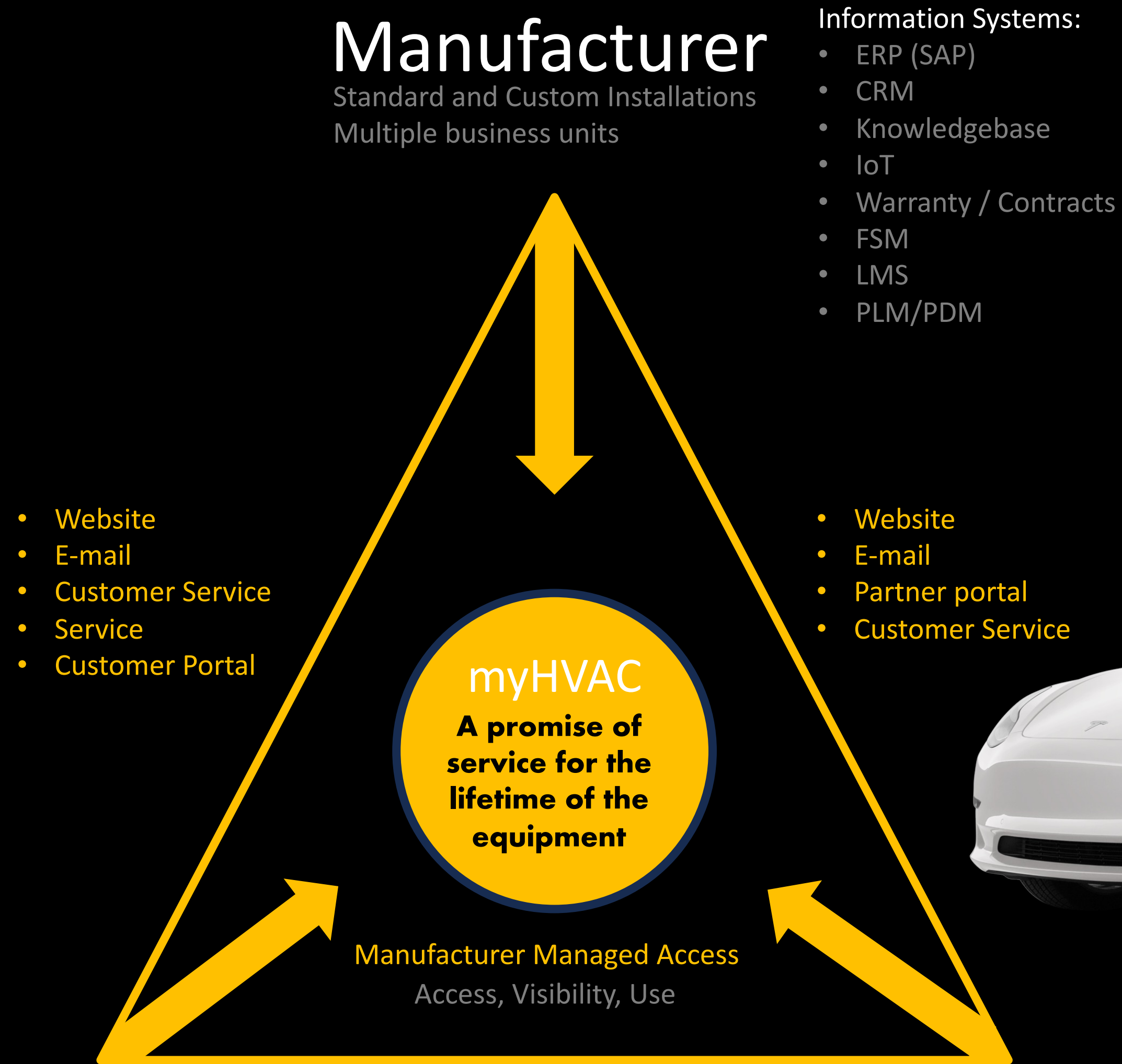
Orig. Acquis. Year

Original value PHP

In-house prod.perc.

Centralized Operational Digital-Twin Hub

An operational **AI Powered digital-twin** of your physical asset; managing data from various sources for the entire **lifetime of each asset**



- Information Systems:
- ERP
 - CMMS
 - Inventory Management
 - Procurement
 - Documents, SOPs, Training

Owner
Facilities manager
Plant technician

- Website
- E-mail

Service
OEM In-house
Authorized Dealers
Mechanical Contractors
Owner or Outsourced

- Information Systems:
- Field Service Management
 - Inventory
 - Documentation, SharePoint, Files
 - CRM

Opportunities with Digitalization



Industrial Printer

Consumable Subscription (Inks and Solvents)

Asphalt Plant

Energy and emissions monitoring service

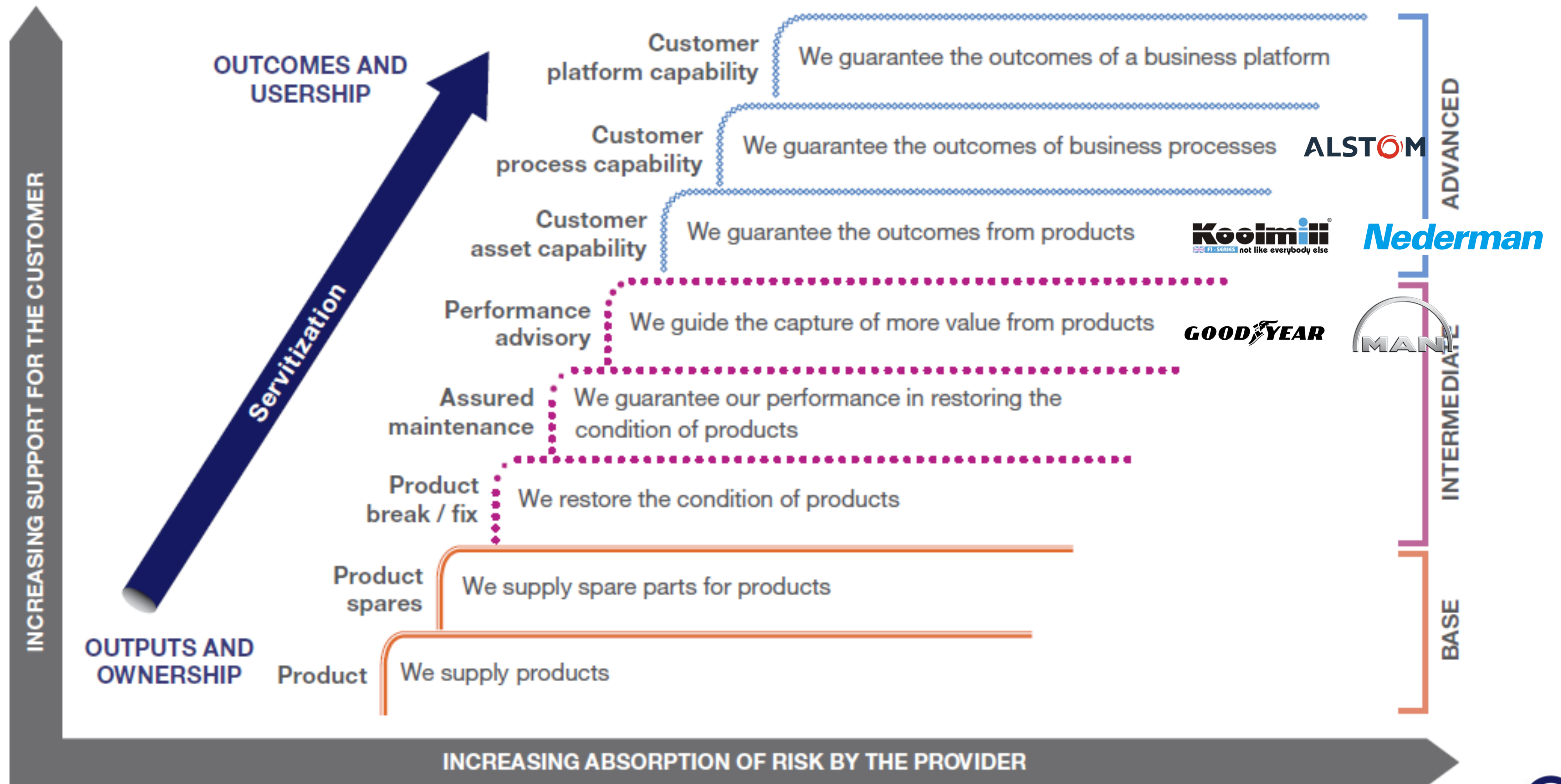
HVAC

Uptime: AI/LLM based ChatBot for service technician (4 hours to 4 mins)

Material Handling

Monetizing IoT with advanced analytics and Genuine Parts Sales

Examples of XaaS / EaaS



Success through digital servitization

ADVANCED SERVICES CASE STUDY

NEDERMAN INSIGHT

SERVITIZATION CASE STUDY

GOODYEAR

SERVITIZATION CASE STUDY

ALSTOM TRANSPORT



USING EXPERTISE AND TECHNOLOGY TO HELP CUSTOMERS MEET THEIR KPIS OF PASSENGER MOVEMENT

HELPING CUSTOMERS TO FUTURE-PROOF THEIR OPERATIONS

GIVING THE CUSTOMER TIME TO FOCUS ON THEIR CORE BUSINESS

Alstom is a French multinational company operating worldwide in rail transport. It develops and markets a complete range of systems, equipment and services in the railway industry and is one of the world's largest manufacturers of high-speed trains, tramways and metros, electrical and diesel trains, information systems, traction systems, power supply systems and track work. It also designs, produces and installs infrastructure for the rail network. It operates in 70 countries and employs 26,000 people.

In the UK, one third of all daily passenger rail journeys are made on Alstom trains, in addition to one million daily journeys on the London Underground.

1 THE CUSTOMER VALUE PROPOSITION
What you will do for the customer and the outcome they will get

2 THE VALUE CREATION AND DELIVERY SYSTEM
How you will do it and the resources and processes needed

3 THE VALUE CAPTURE PROCESS
How you will get the benefit from what you do

COMPETITIVE ADVANTAGE
Why you will be better than your competitors at doing what you propose

Koolmill Systems uses servitization to access global markets with sustainable food production

UK-based SME, Koolmill Systems, has combined the powers of servitization and disruptive technology to help feed a growing global population as well as giving the business a competitive edge. The company has teamed up with academics at Aston Business School to give customers across the world access to transformative techniques through its milling-as-a-service business model. The low-power waste-saving system is designed to empower small-scale milling operations and revolutionise cereal production.

At a glance...

- More than 3 billion people are reliant on rice as sustenance, yet milling techniques are out-dated and inefficient.
- According to the United Nations Food and Agriculture Organization (FAO), rice production must increase by 70% by 2050 to meet global demand.
- Koolmill's technology reduces the cost per tonne milled by up to 63% and drastically cuts processing losses.
- Given its performance data, Koolmill estimates that it can generate £1,200 to £2,000 of revenue per month per machine and is targeting operating 7,500 machines within the next 5 years, with annual turnover set to rise from £129,000 to £100m. That is based on Koolmill taking 20% of the financial gain and providing service contracts to just 0.05% of the obtainable market.

Lower environmental impact

in industrial air filtration. Its aim is to help production and the dust, smoke and fumes has 1900 employees and additional 30 countries on continents.

ives customers in solutions, allowing predict maintenance, optimize energy use. No make recommendations customer more time core business.

Koolmill
F1-SERIES not like everybody else
www.koolmill.com

European Union
European Regional Development Fund



What is not an XaaS business model?



Software portals on a subscription
Monetised data monitoring

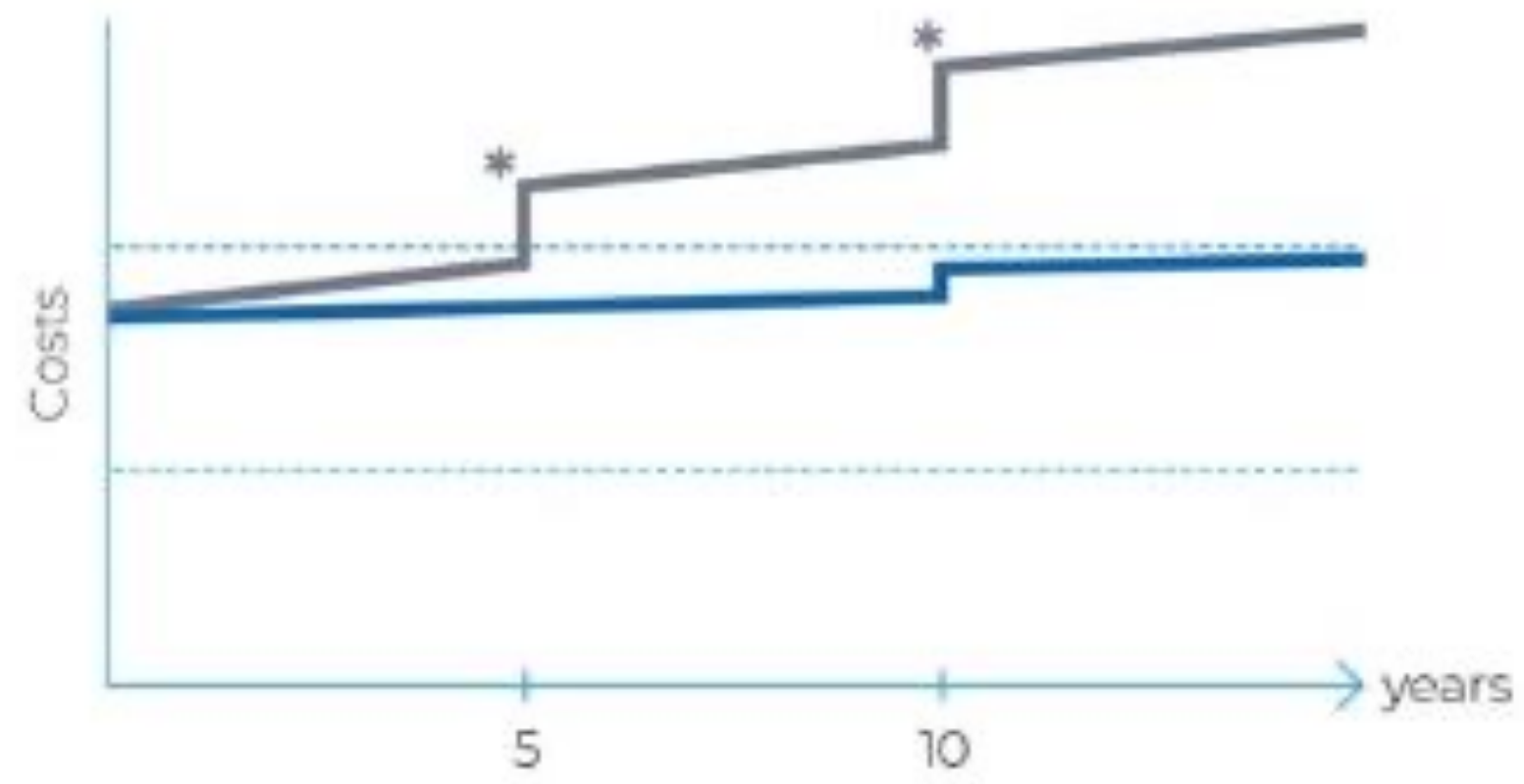
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1 Creative revenue model
Rental models
Financing solutions

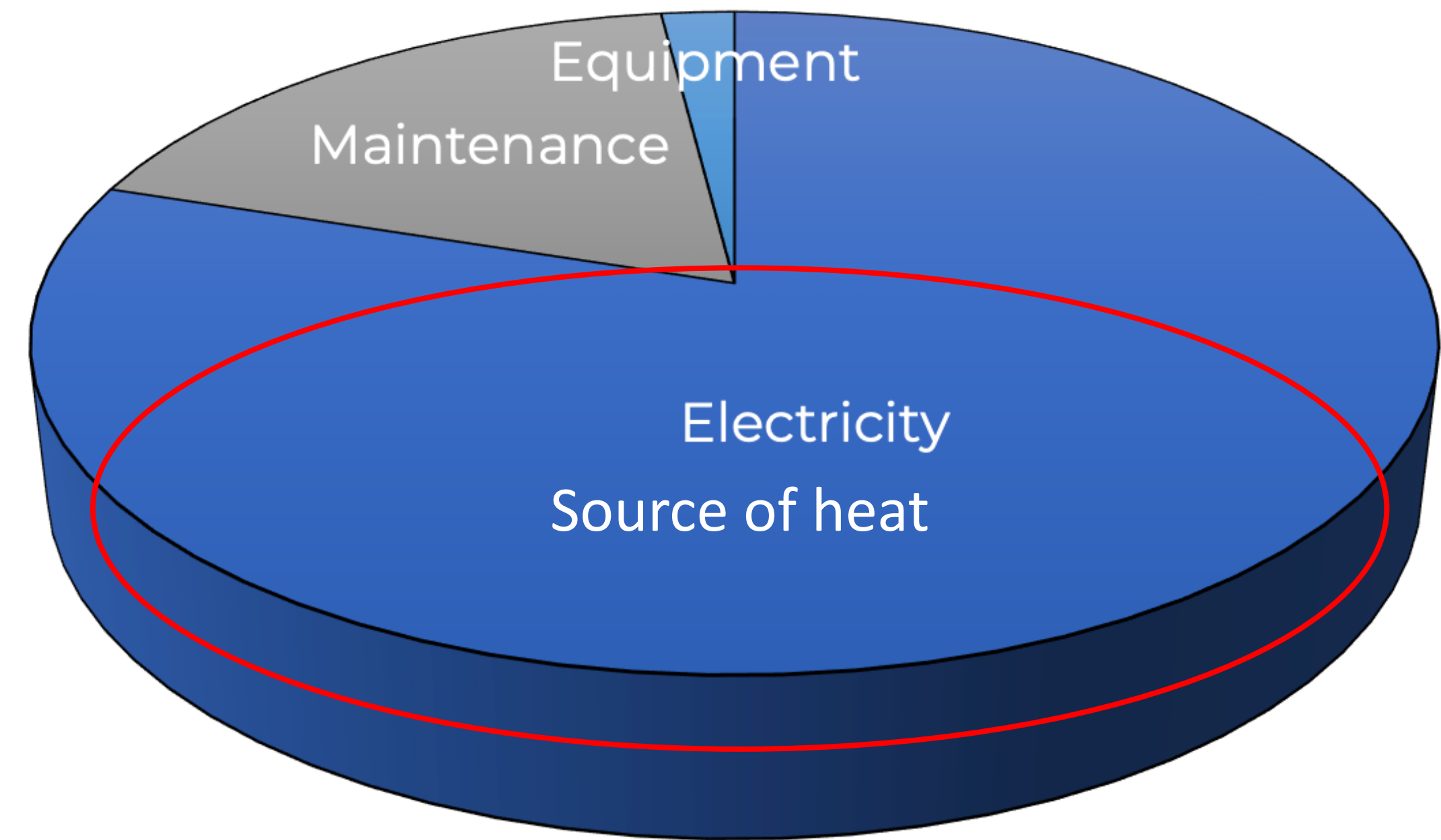
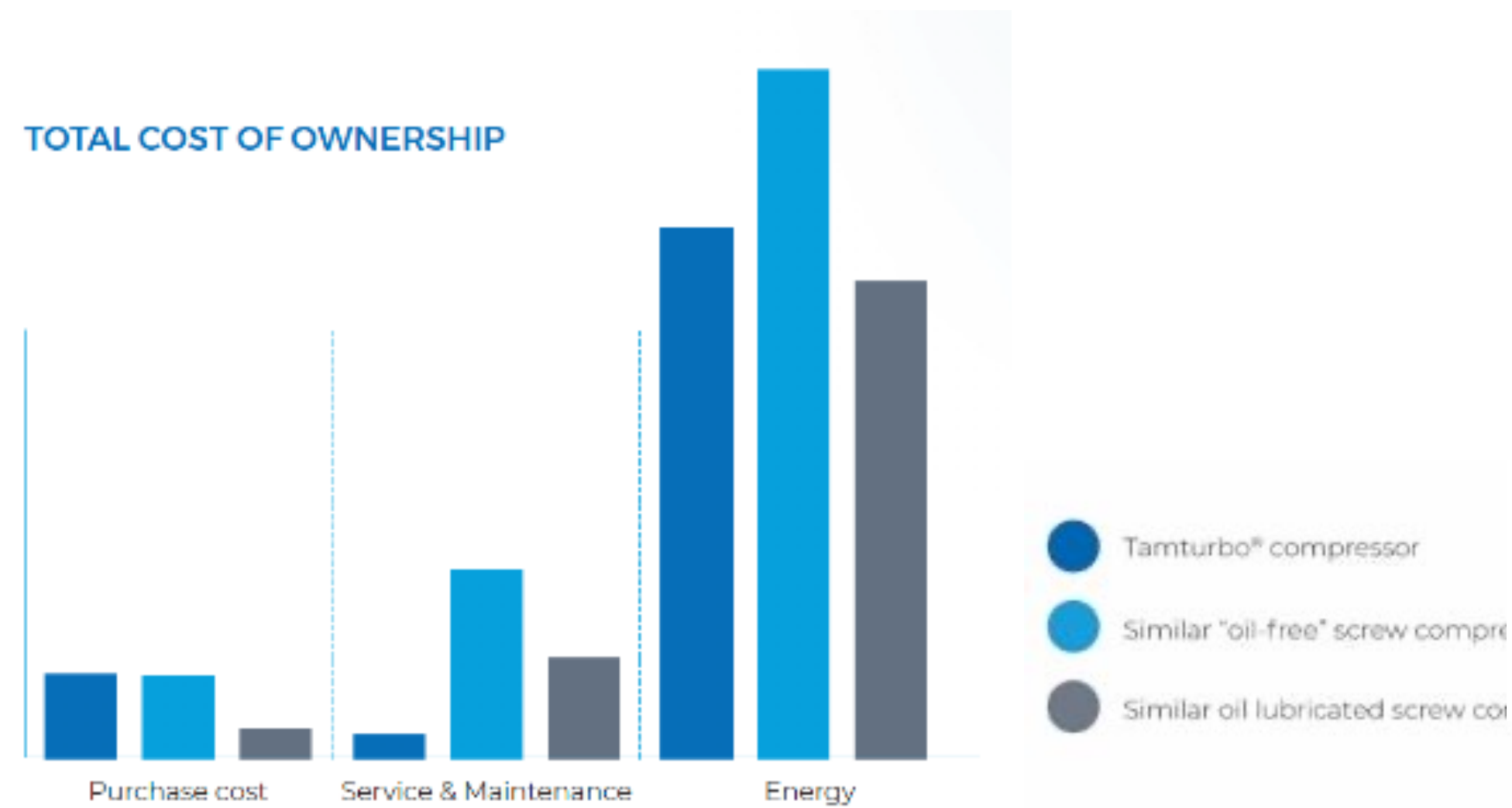


Opportunity of Digitalisation within Servitisation *Tamturbo Case Study*

Sharing the benefits of the low LCC



TOTAL COST OF OWNERSHIP

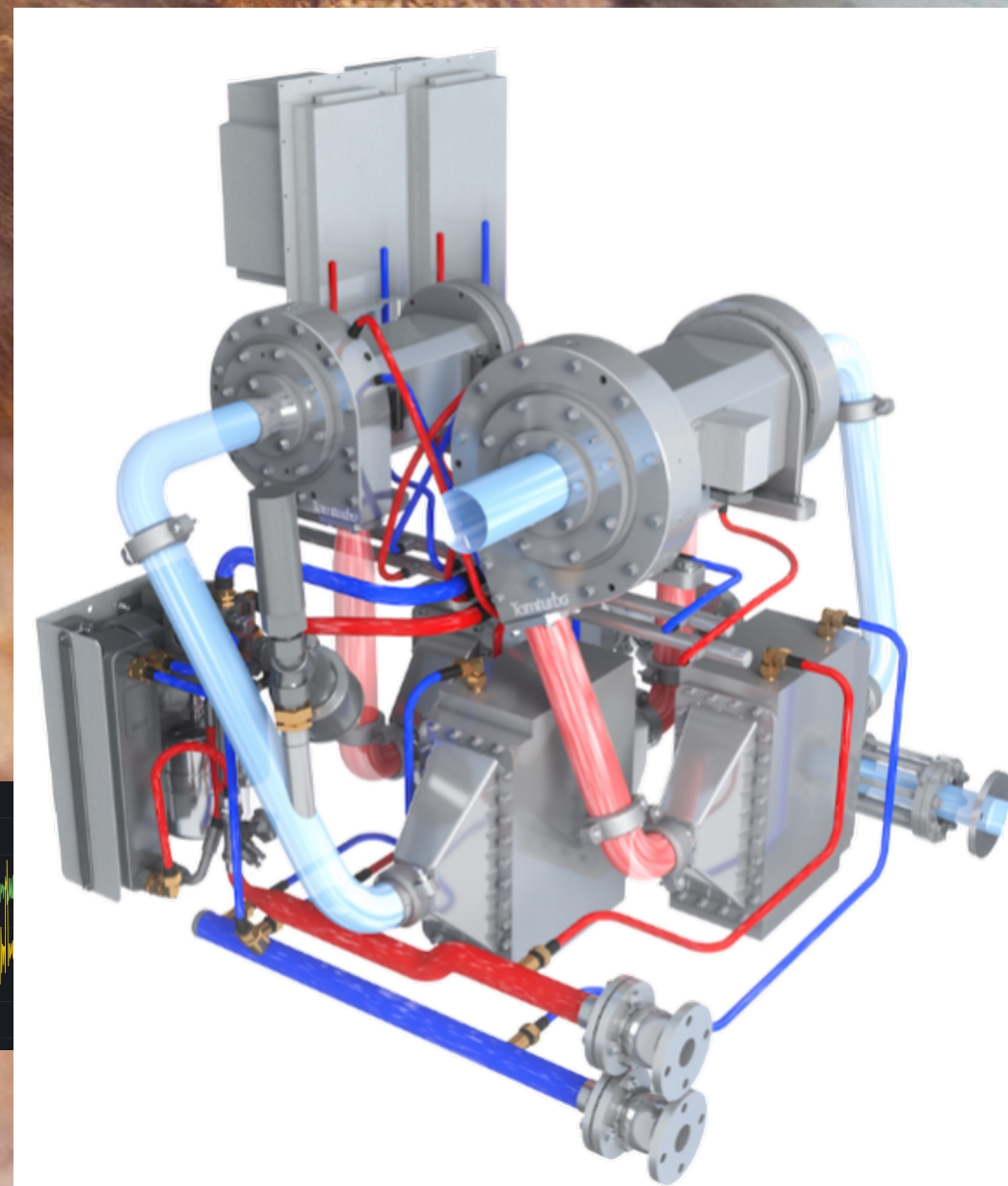


Heat recovery

- Capture the heat from
 - Compressed air
 - Frequency converters
 - Electric motors
 - Turbos.
- Recover up to **90%** of the input energy, up to **90°C** steady temperature, independent of compressor load fluctuation
- Hot water for process, lowering primary energy consumption

“Waste heat as-as-a-Service”

Tamturbo
JUST AIR



PURCHASE ALTERNATIVES

Investment + maintenance

Traditional compressor business

Investment + Care-Free Service

Up to 10 years. All wearing parts, spare parts and labor included

Touch-Free™ Air

Compressor + all related expenses included

Pricing: €/m³ and €/kWhe

→ production changes easy, adaptive to customer needs, OPEX



Real-time remote monitoring
and optimization

Predictive Maintenance

Touch-Free Air – Case financed by savings

- Customer had no need for a new compressor, had 10+ compressors in different operating conditions
- Carbon neutrality targets
- Savings targets, but limited CAPEX
- €/m³ of air + €/kWh of returned energy



Case example, no budget impact:

Annual price with estimated usage	101 483	€
Annual savings with estimated usage	101 751	€

1. Savings through lower electricity consumption
2. Maintenance savings
3. Savings through energy reuse (Boosted Heat Recovery)
4. Savings through more optimal compressed air production

TT325 BHR customer in Europe, additional benefits on top of monetary (electricity and energy recovery) savings

INCREASING POTENTIAL FOR VALUE CREATION



POTENTIAL FOR COMPETITIVE ADVANTAGE THROUGH THE ABSORPTION OF RISK

Thank you!

www.tamturbo.com

Olli.kuismanen@tamturbo.com

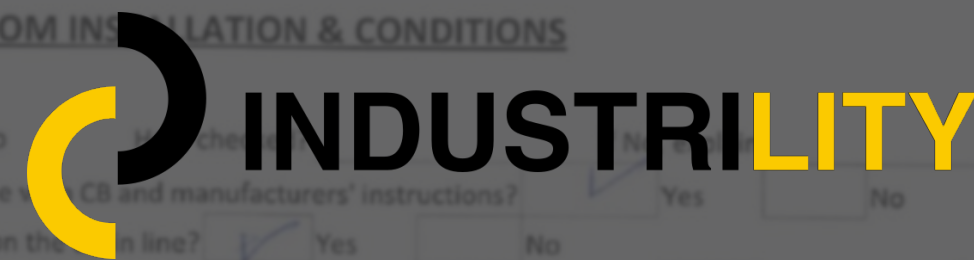
+358 40 766 5678

Tamturbo
JUST AIR



Industry Digital Servitisation Demo

Data and Technology as an enabler



Carbon Footprint
Alerts Sensors
GPS Location

Telematics

Modbus
SIM
OTA

Connectivity

Certifications
courses

Training

AEC
3D
2D

Design

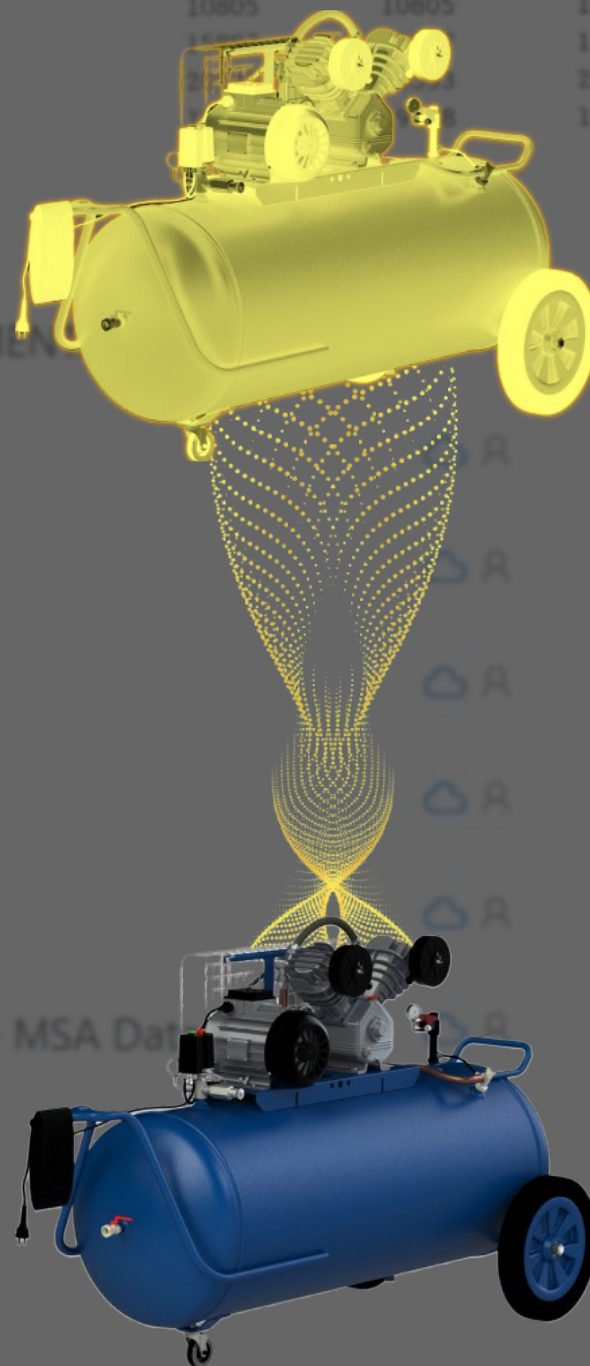
parts
claims
duration

Warranty

First owner 2nd owner Distributors

Customers

s/n: 1234
My Asset



Powered with AI

Maintenance

Inspections
Repair
Scheduled

Parts

Components
Consumables
Accessories

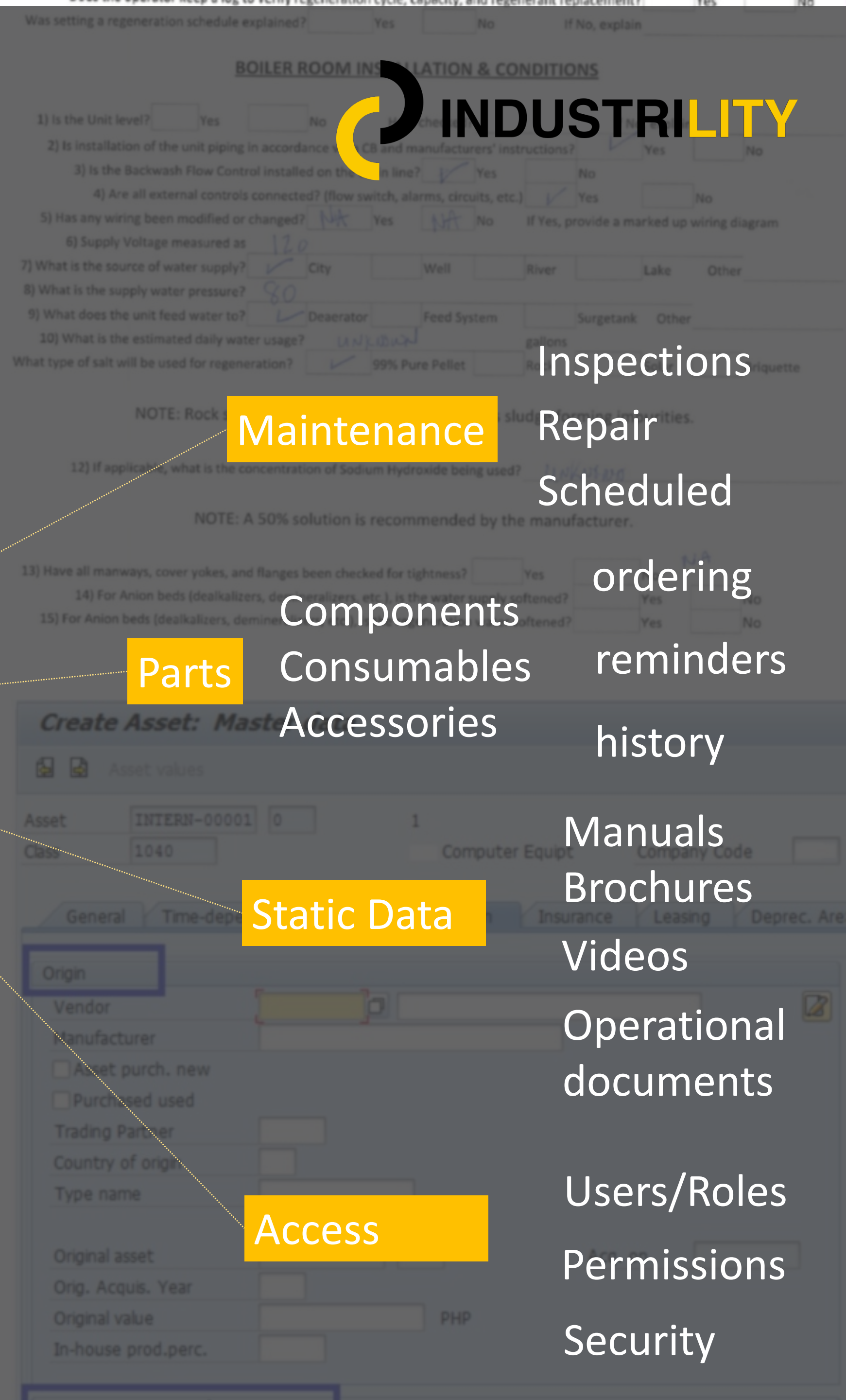
ordering
reminders
history

Static Data

Manuals
Brochures
Videos

Access

Operational
documents
Users/Roles
Permissions
Security



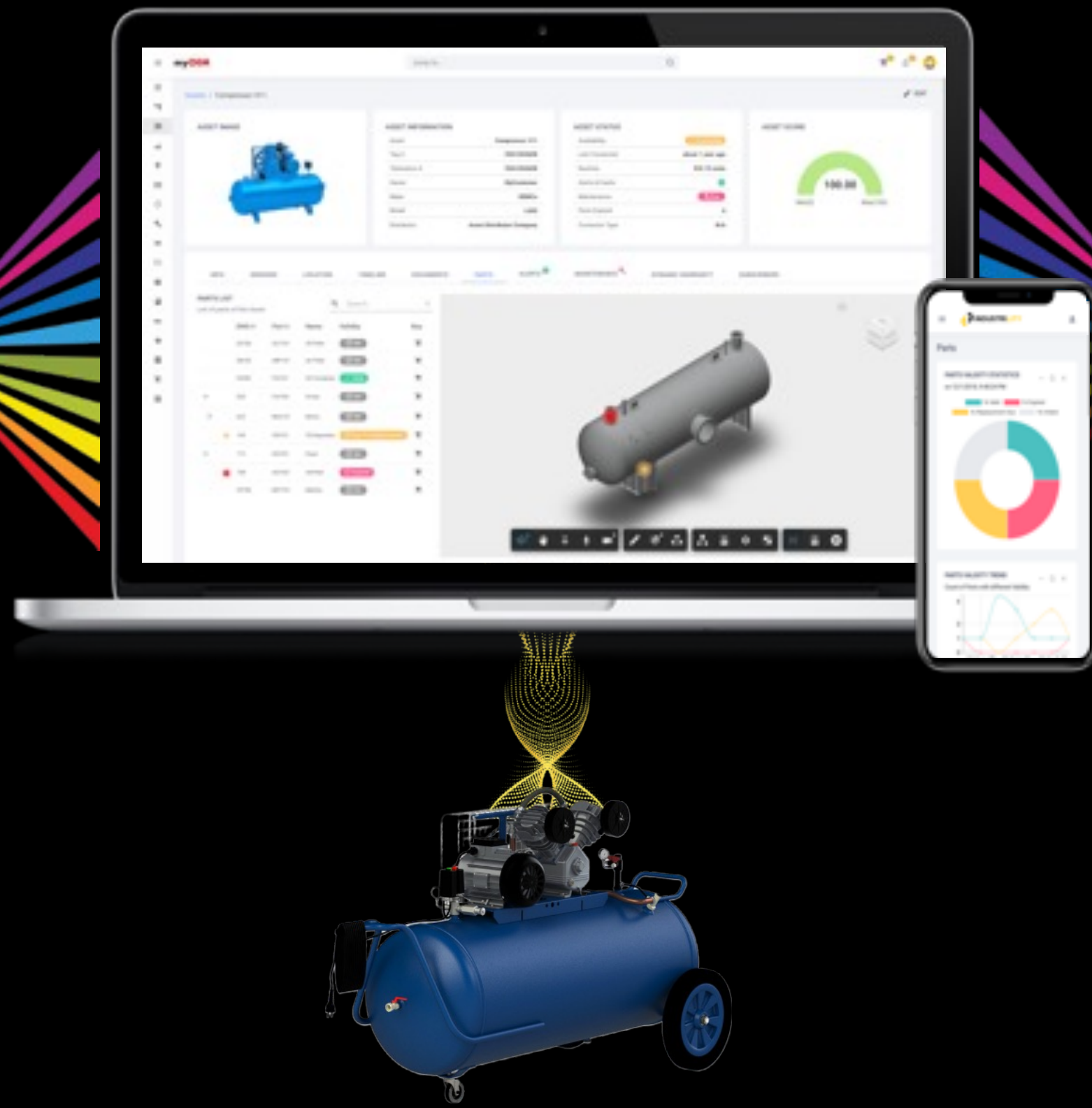
Product: Unified Asset Aftersales Experience

Apps for Different Stakeholders

MyOEM Customer-facing after-sale application

- Connected Assets
- Legacy Assets
- Connected Parts
- Unconnected Assets
- Total Systems

Assets
Equipment or Systems



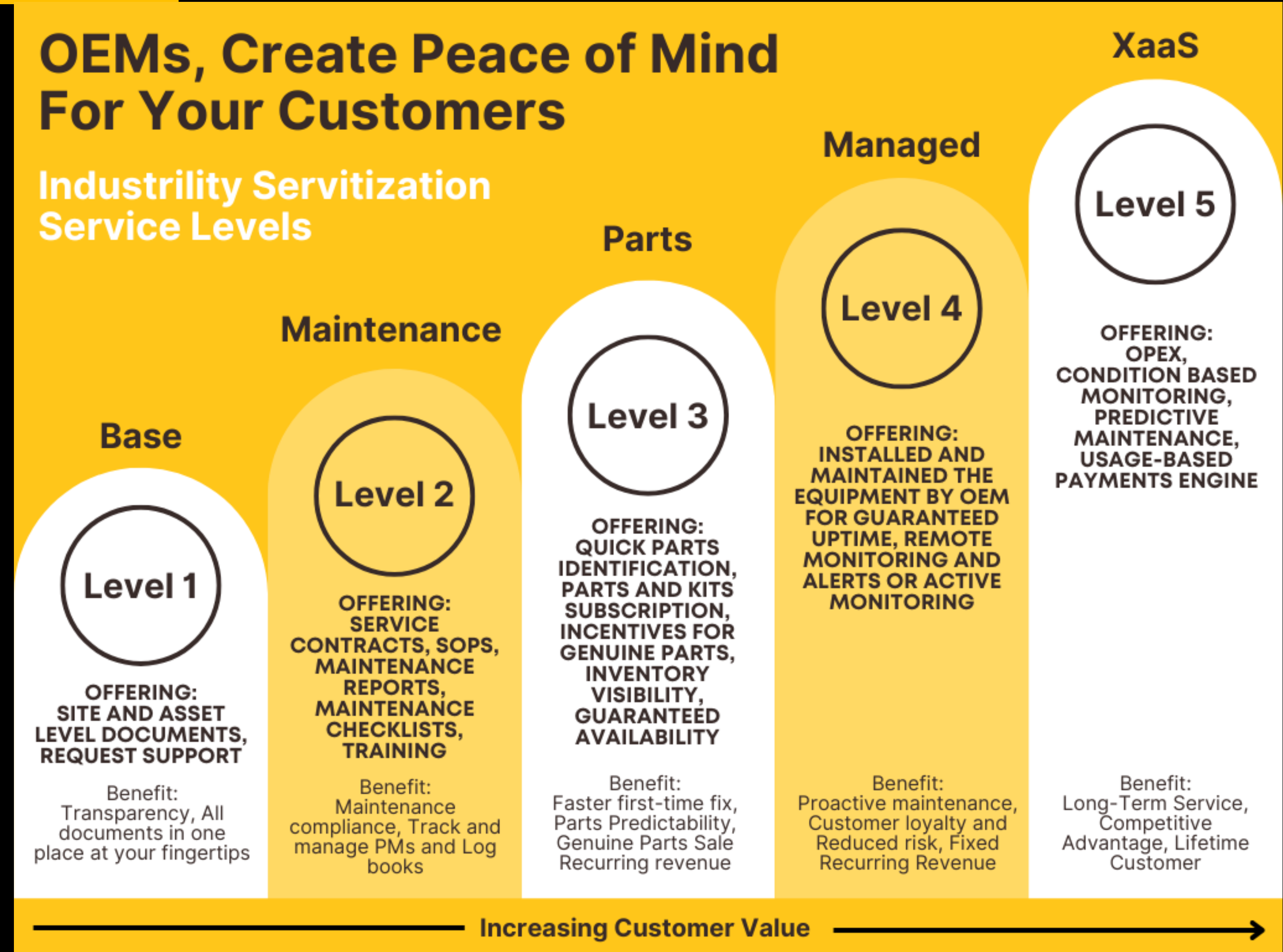
Apps
Customizable Modules

- Assets
- Systems
- Parts
- Maps
- Warranty
- Manuals
- Alerts
- Maintenance
- Timeline
- Inspections
- Checklists
- Decarbonize
- Training
- Video
- Knowledge Base
- Users
- Inventory
- Dealers
- Ecommerce
- Orders
- Your own Custom App**

Powered with AI

Enabled by modular Apps

Track and Manage Your Service Levels with Industry's Flexible Servitization Apps



Modular Apps



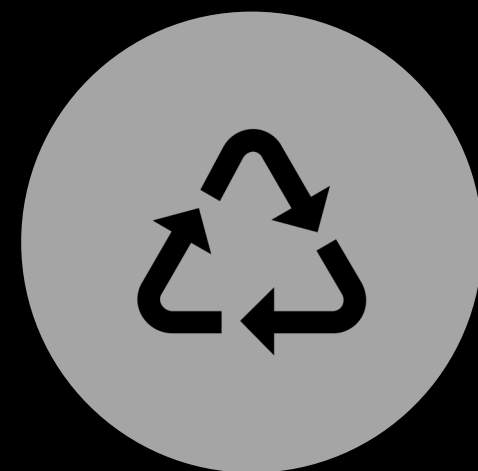
DEMO

- ✓ Base Services: Enabling Self-Service (Parts)
- ✓ Intermediate Services: Uptime and Energy Monitoring
- ✓ Advanced services & Circularity: Lifecycle Management
- ✓ Use of Industrial-AI

Act Now!



UNLOCK REVENUE
FROM YOUR
ENTIRE FLEET



USE A PURPOSE-
BUILT SOLUTION
FOR
SERVITIZATION



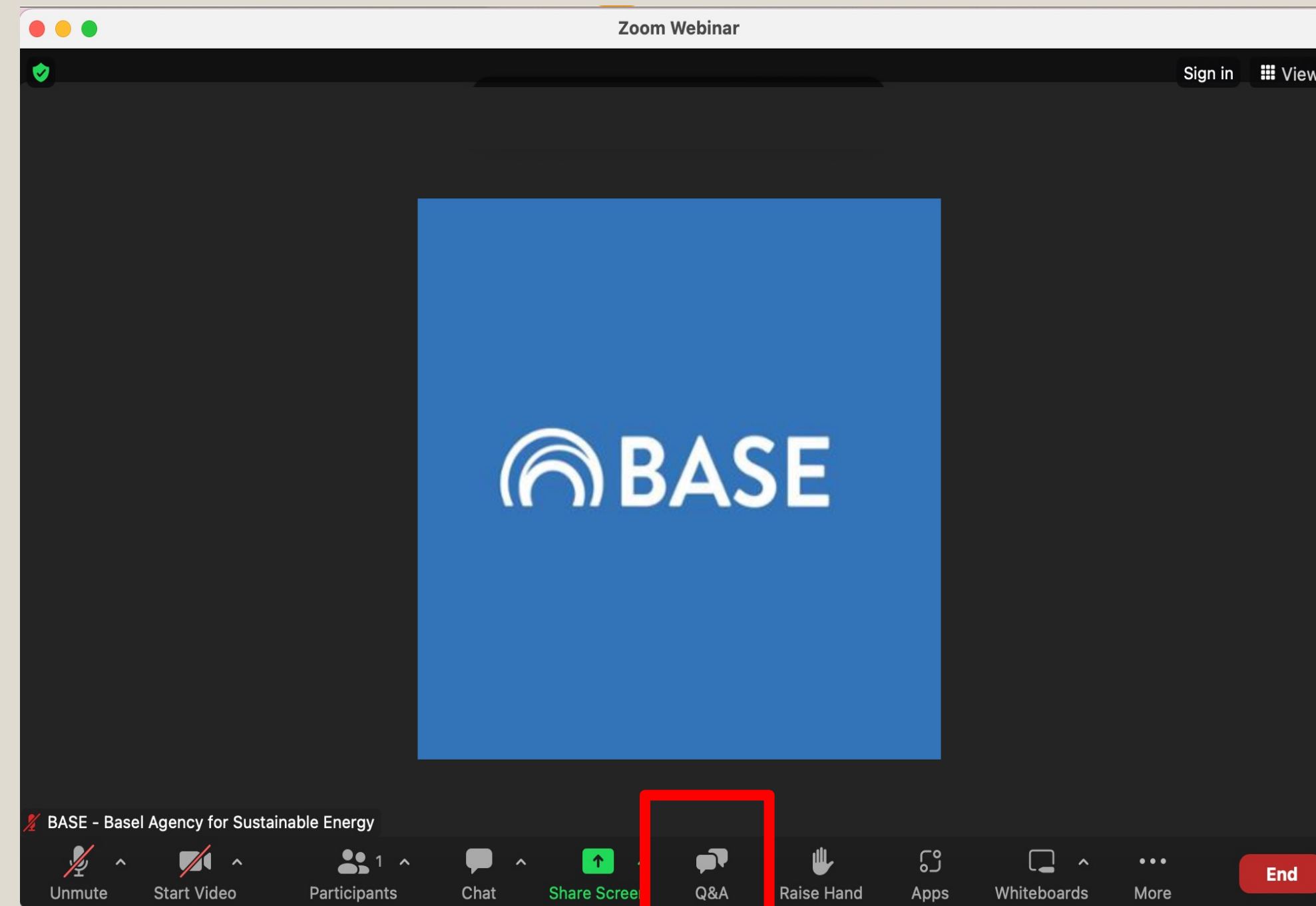
PARTNER EARLY
AND INVEST IN
GEN-AI

Reach out to Dimitris (dimitris.karamitsos@energy-base.org) or Achint (achint@industriality.com) to avail £5,000 contribution

Q&A & Conclusions

Q&A

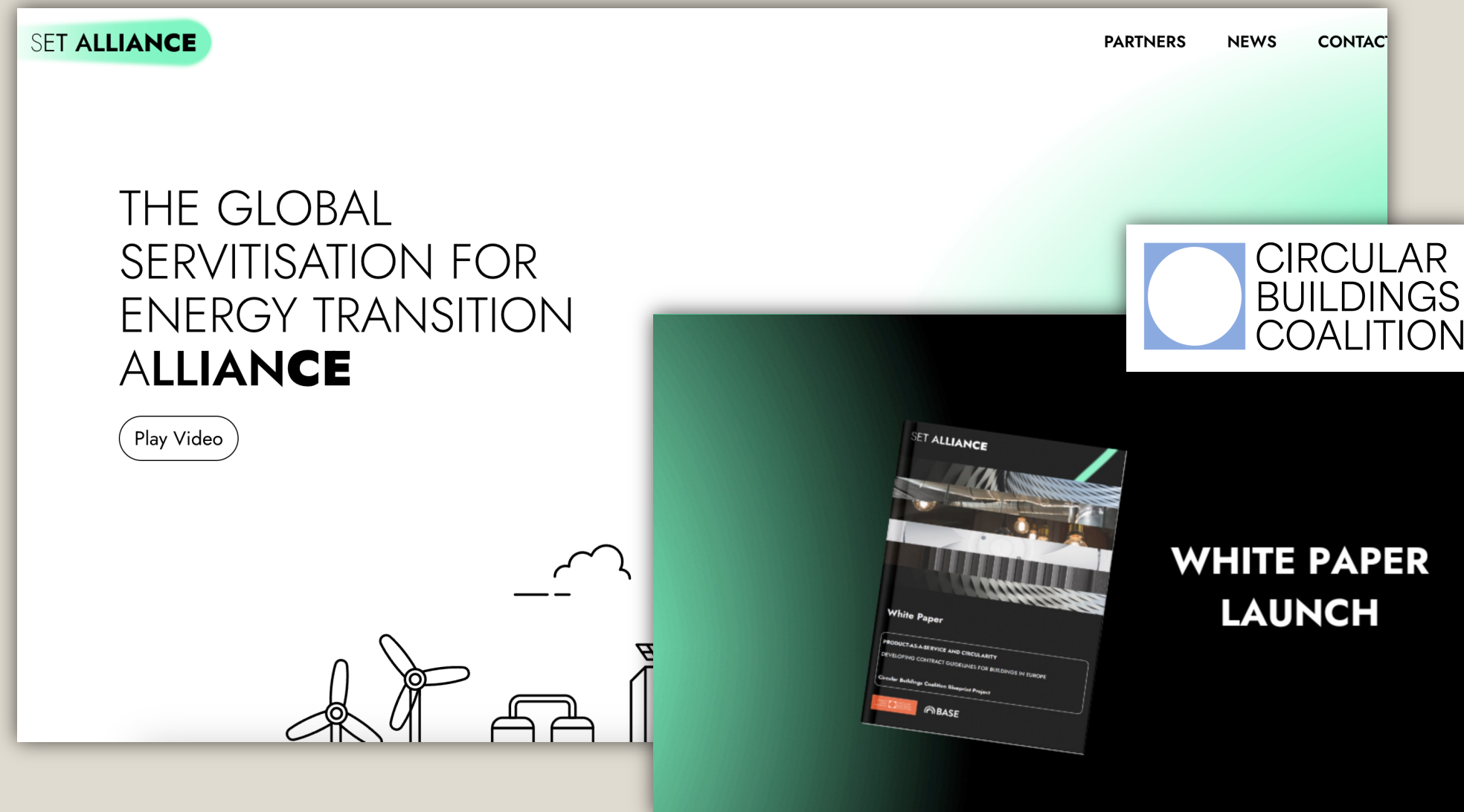
SET ALLIANCE



- Ask questions
- Write comments

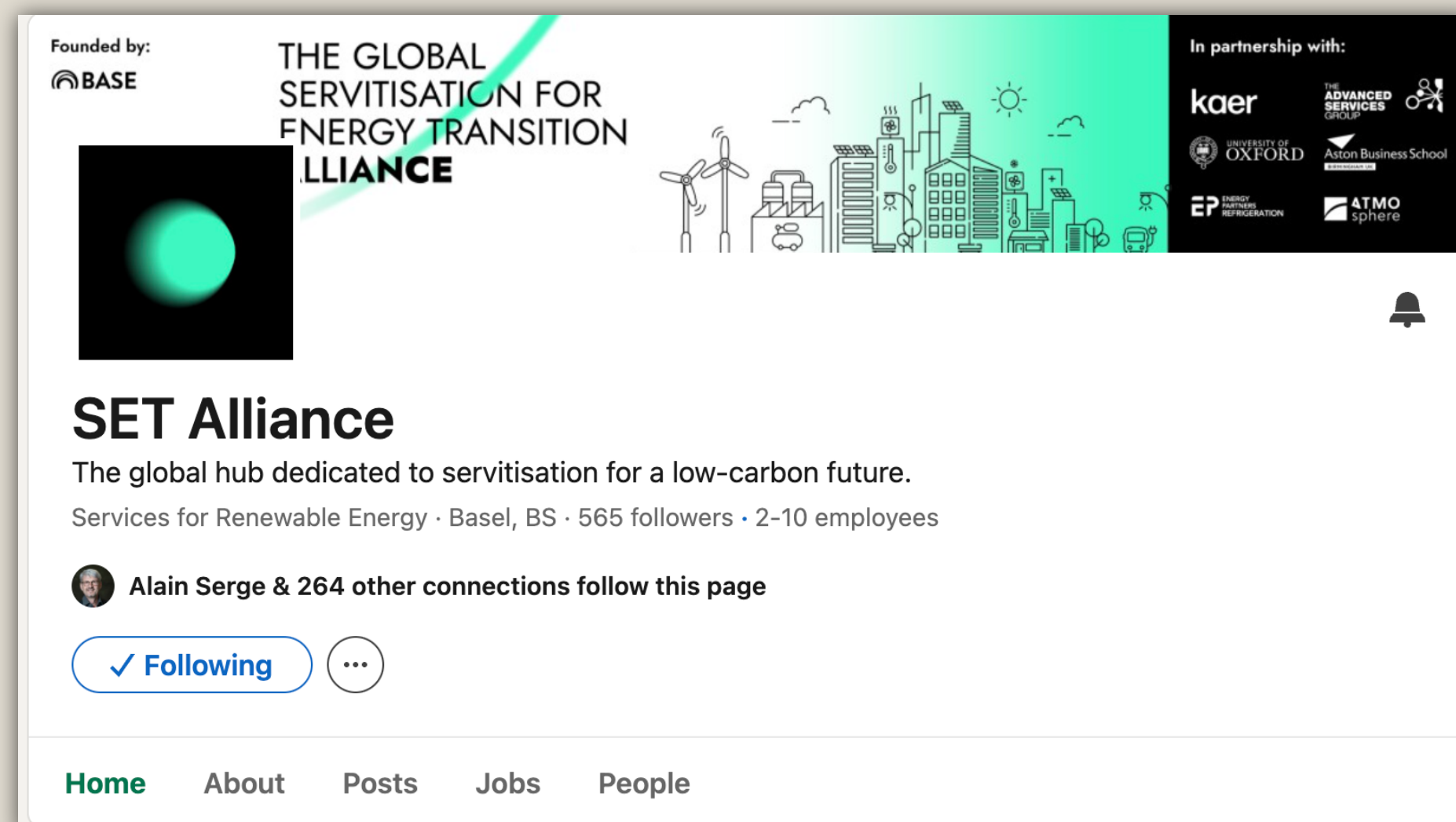
Connect!

SET ALLIANCE



- Visit recordings, case studies and articles
- Download the CE PaaS white paper
- Next webinars
- Contact us on:

- info@set-alliance.org
- Dimitris.karamitsos@energy-base.org
- Emma.wink@energy-base.org



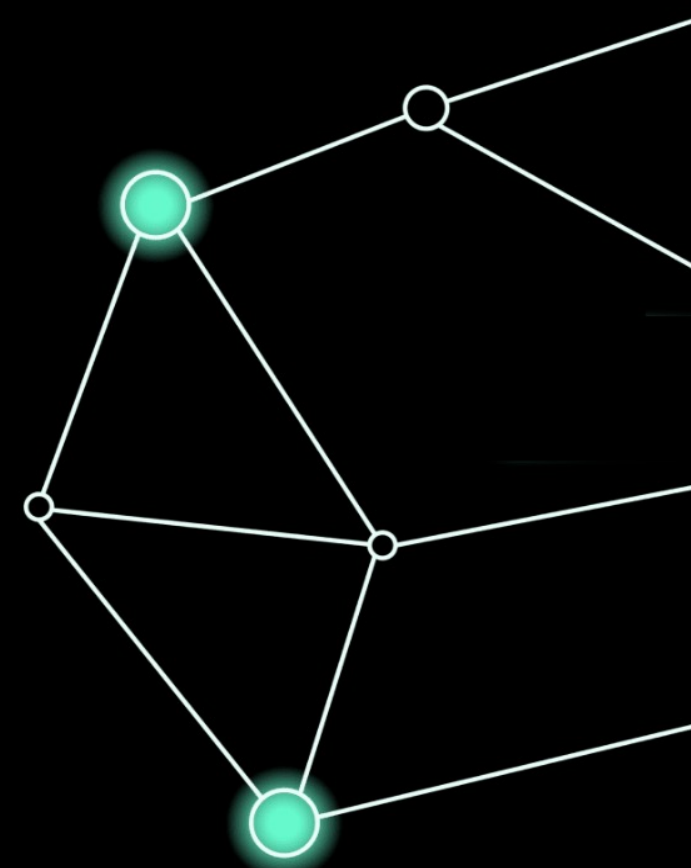
- Follow the SET Alliance on LinkedIn:
<https://www.linkedin.com/company/set-alliance/>

SET ALLIANCE WEBINAR

Getting XaaS off the ground: successful journeys towards servitisation

September 2024

Date to be confirmed



SET Prize 2024

- Selection process - Technology used, impact metrics, circularity
- Case study design
- Dissemination support
- Invitation to next webinar: success stories

Application open until July 26th

THANK YOU FOR YOUR ATTENTION



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SET ALLIANCE

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Founded by



stiftung-BASE



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Strategic partners



UNIVERSITY OF
OXFORD



Aston Business School
BIRMINGHAM UK

Survey

SET ALLIANCE

*Scan & complete
the feedback survey*



Thank you!