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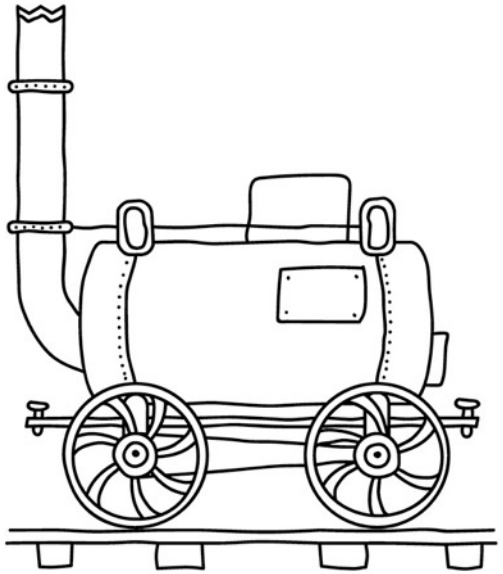
Virtual engineers:
A new breed of products to save money…and lives in manufacturing

Industry 4.0 is

Bullshit

In manufacturing:



1st industrial revolution

Lack of Muscles
➔ strong
machines

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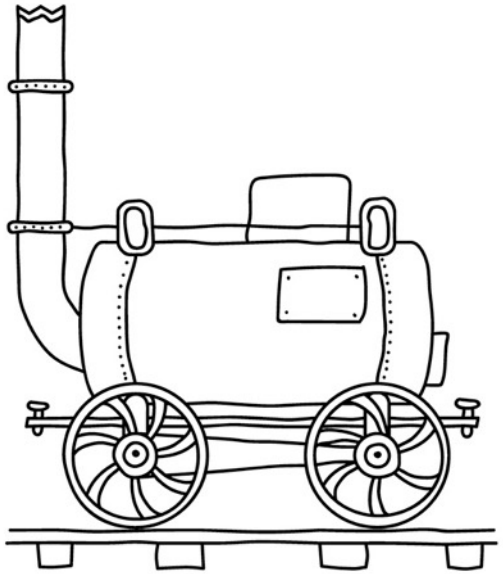
In manufacturing:



1st industrial revolution

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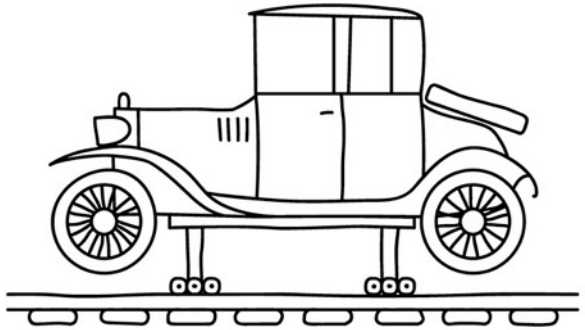

2nd industrial revolution

Lack of laborers
➔ series production

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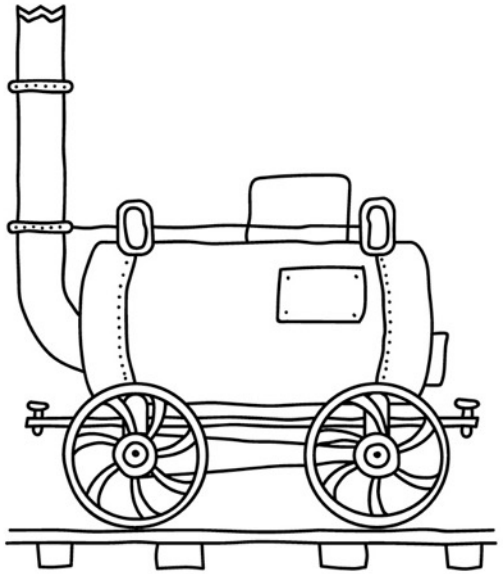
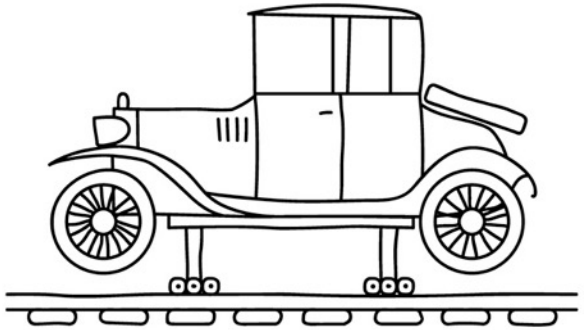
In manufacturing:



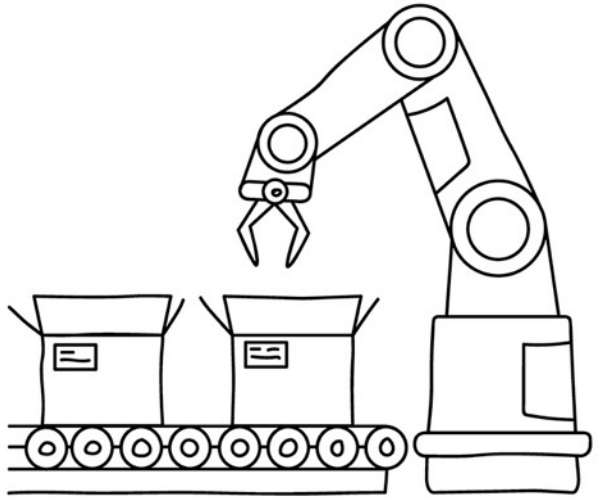
1st industrial revolution

Lack of Muscles ➔ strong machines



2nd industrial revolution

Lack of laborers ➔ series production



3rd industrial revolution

Lack of skilled laborers ➔ advanced production

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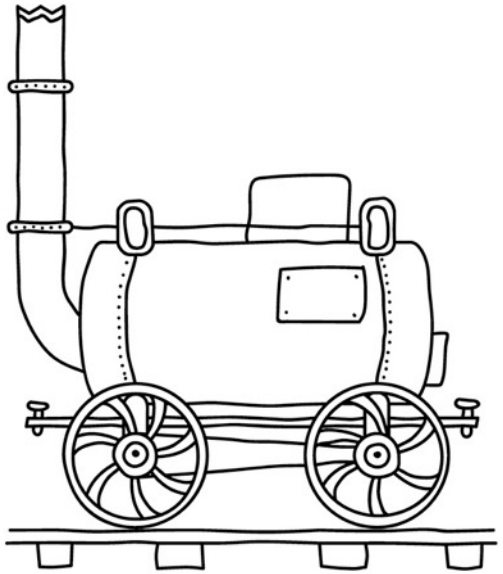
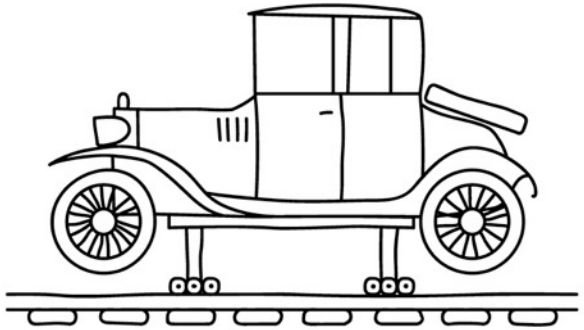
In manufacturing:



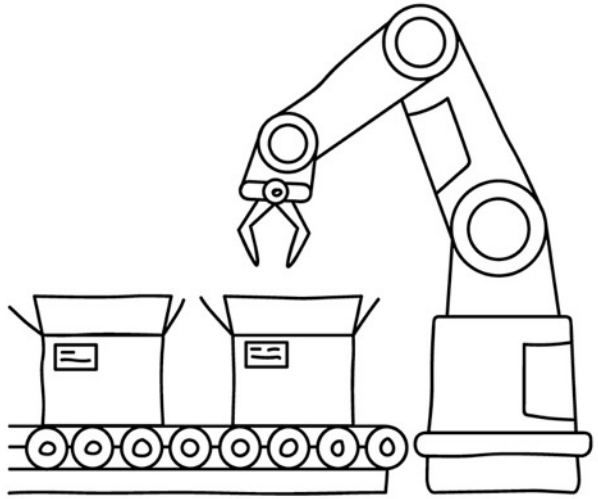
1st industrial revolution

Lack of Muscles ➔ strong machines



2nd industrial revolution

Lack of laborers ➔ series production



3rd industrial revolution

Lack of skilled laborers ➔ advanced production

4th industrial revolution

Lack of skilled engineers ➔ Smart Machines

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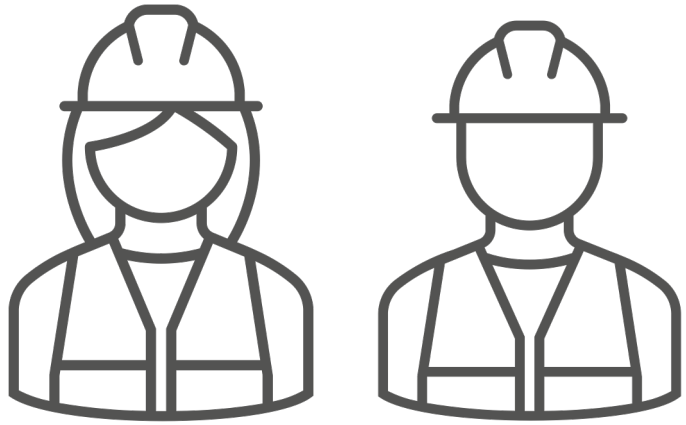
The solution: Virtual Engineers



- Collect the required data
- Connect and relate
- Observe and interpret
- Translate into insights
- Warn and alarm
- Report such that users and colleagues understand…

  and know what has to happen next

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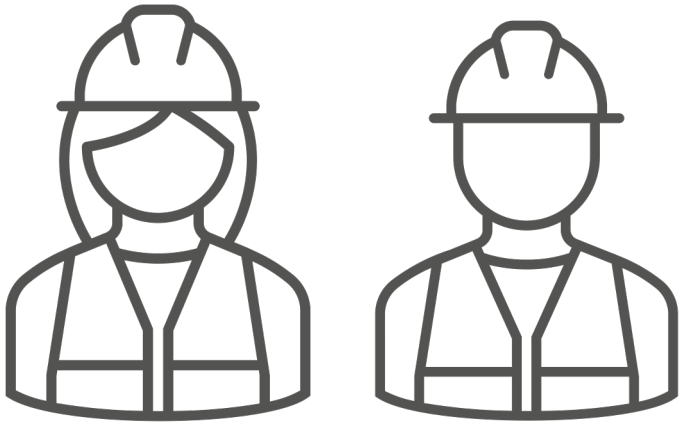
The solution: Virtual Engineers



+

- Work 24/7
- Based on lots of classical physics, aided by AI where relevant
- Context-aware
- Continuously getting smarter

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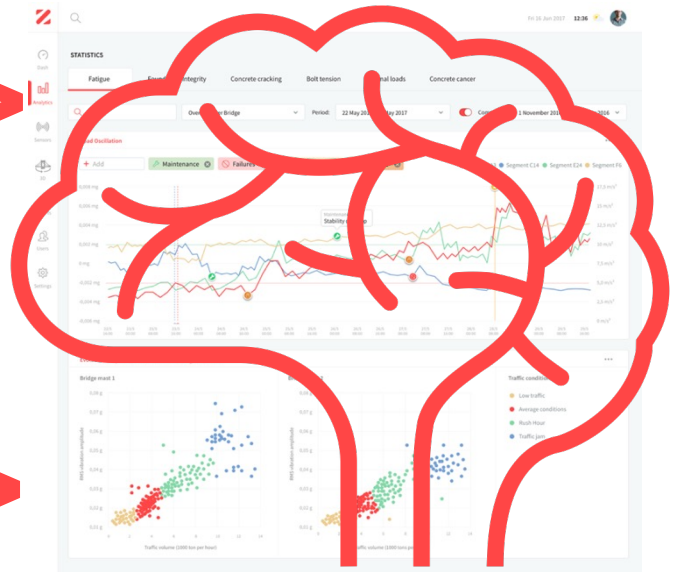
What they consists of:

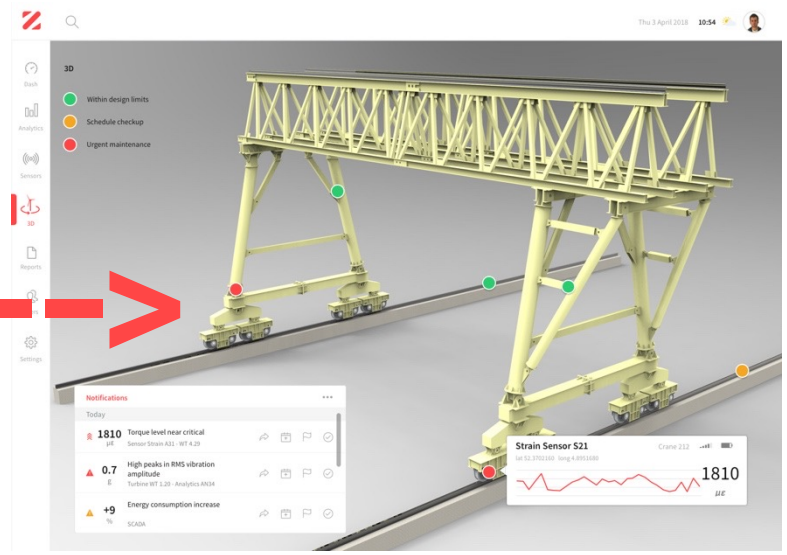
Wonderware iFIX

WinCC Professional

iba

FactoryTalk by ROCKWELL AUTOMATION





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The problems they solve:

Client 1:
10% of today's production has to be thrown away: 30.000 € loss

Client 2:
Unforeseen standstill costs 2.000 € / hour

Client 3:
1 day of production loss = 30.000 €

Client 4:
½ hour of extra availability / day = 600 € / week saved

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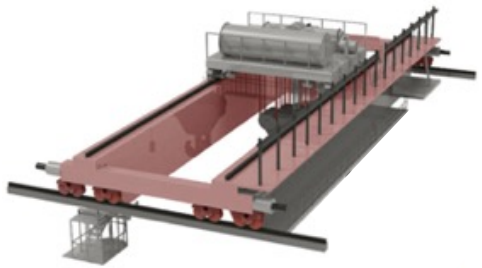
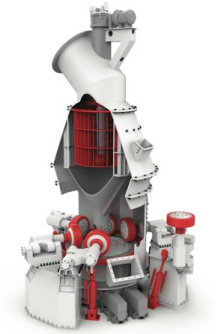
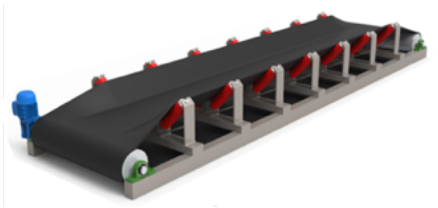
Company focus: Specific products for specific assets:



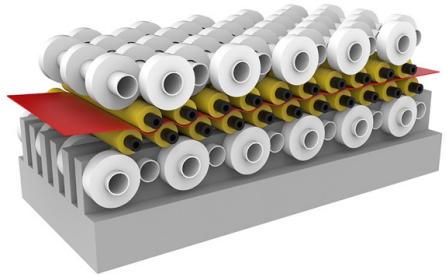
Rolling bridges



Grinders



Conveyors and sieves



Rolling installations

■ ■ ■

Specific products, for specific assets, for specific verticals:

Scope today:

Sector / *Asset*	Steel & Metals	Mining & Minerals	Bricks & Building Materials	Food
Rolling bridge	X		X	X
Grinder		X	X	X
EAF	X			
Sieve		X		X
Conveyor	X	X	X	X
Rolling Mill	X		X	X

Market Size:
275 Mio € ARR in Europe

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More ‘smartness’ in industry:

System-specific

Context-aware

Multi-aspect

Smart Analytics

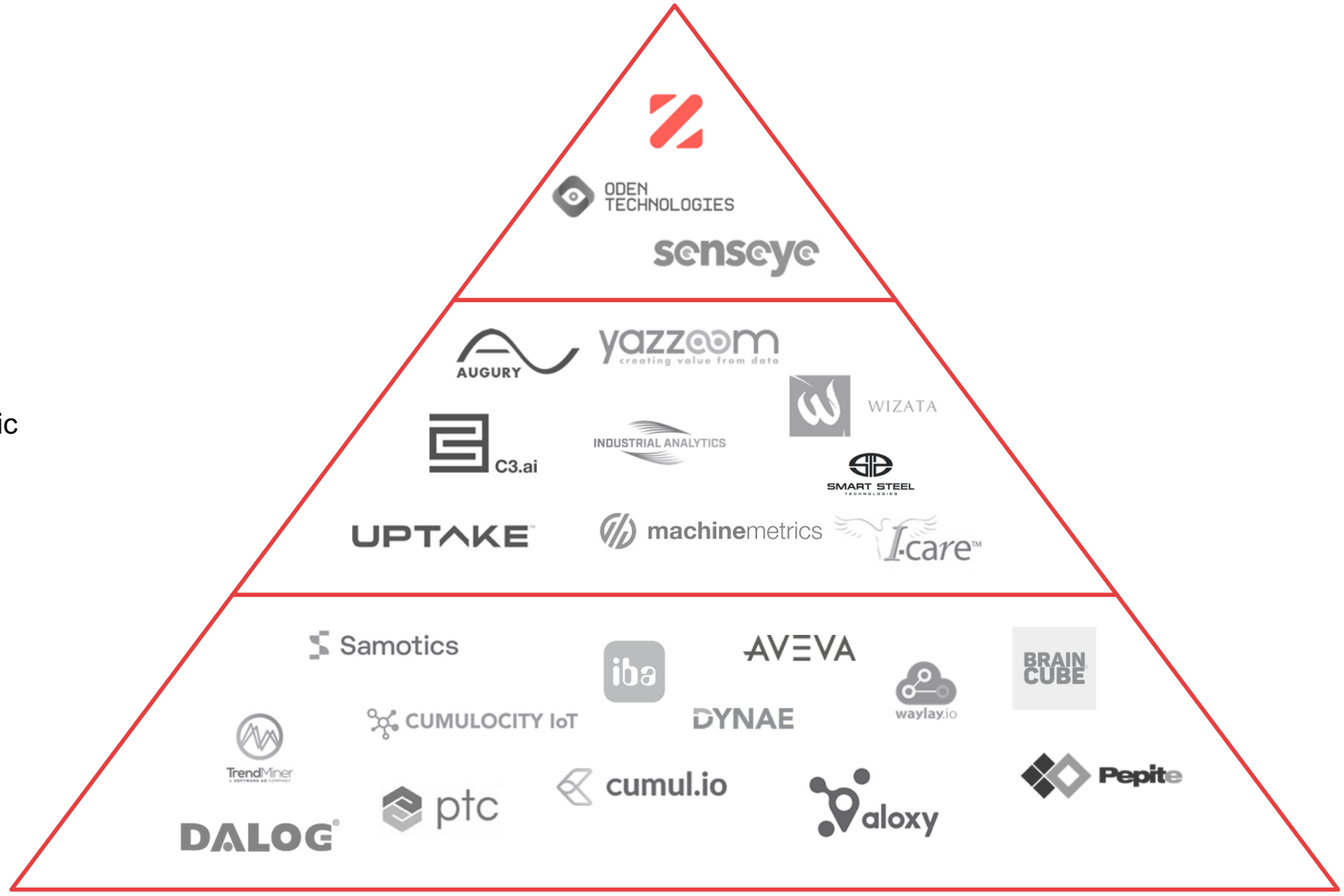
Component-specific

Single aspect

Data management

Smart sensors

DIY analytics



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Our value?

"Historiquement, nous louions du matériel à des entreprises spécialisées qui réalisaient des campagnes de mesure sur 2 ou 3 mois, et sur des points bien spécifiques. Finalement, le coût de ce projet, avec l'achat des capteurs qui maintenant nous appartiennent et qu'on peut réutiliser, correspond à une campagne annuelle de monitoring qui ne donnait jamais rien. Et nous n'avons plus d'indisponibilité des infrastructures."

Terēga

Jean-Marc Jouanine, CTO @ Terēga

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Case: rolling bridge collapse prevented

Zensor is specialized in multi-aspect continuous and automated monitoring of rolling-bridges to maximise availability and extend operational life. Various aspects are covered, including drivetrain, structural health and rails.

Case:
In the first half of 2022 a highly probable rolling bridge collapse was prevented as a result of Zensor's continuous monitoring

Details:
40 T capacity rolling bridge, 2 hoists
Operating in primary metals production: liquid metal handling
Crane operator in cabin

Prevented fatality

Context:
Continuous follow-up of dynamics (accelerations) in various positions and directions as well as deformations through Zensor platform and the associated automated analytics. Platform indicated excessive dynamic behavior that was not related to:

- Component damage or degradation
- Rail damage

Alarms and warnings were sent. The deviations observed were related to progressive structural degradation.

Outcome:

- Avoiding of probable bridge collapse,
- Avoiding associated injuries,
- Minimal production losses
- Minimal repair costs

Zensor NV
Witte Patersstraat 4
1040 Brussels
Belgium
info@zensor.be
http://www.zensor.be

www.zensor.be

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Case: EAF slewing bearing failure predicted

Zensor is specialized in multi-aspect continuous monitoring of Electric Arc Furnaces, AODs and Continuous Casting turrets. As an outcome our clients see degradation in a much earlier stage and can optimize their process and operations such that availability can be kept at a maximum and production losses can be minimized.

Case:
In the first half of 2022 a degradation of a slewing bearing of an EAF turret was detected in an early stage.

Details:

- 160 T Capacity EAF
- Continuous operation
- Stainless steel plant

Saving of 200.000 €

Context:
Continuous and automatic follow-up of the state-of-health of the EAF by combining data coming from:

- the historian system
  - Rotational angle
  - Process stage
- as a set of dedicated additional sensors:
  - vibrations
  - inclination
  - distance

The incoming data streams are continuously classified based on the operating stage of the installation.

Jean-François Didier • 1st
Head Of Reliability & Automation chez Aperam
1mo •

A pleasure to work with **Zensor** and **Noé Van Bellinghen**.
On the way to a new succesful project !

Zensor
1mo •

We are glad to announce that Zensor is once again starting a project with our client **Aperam**, the Châtelet site! 🏭

...see more

The proof: Asset-specific products:

Asset Type	# contracted / active	# in sales pipeline
Rolling Bridge	14	51
Rolling Mill	5	17
Grinder	3	16
Conveyor	3	19
EAF/CC	2	10
Oven	2	20
Converter	1	3
Sieve	1	4

Scaling in accounts: Logo growth:

# assets active / contracted	2018	2019	2020	2021	2022 (to date)
Lhoist	0	0	0	1	2
EMAX SUSTAINABLE ALUMINIUM	0	0	1	1	2
Aurubis	1	1	1	3	6
Puratos Reliable partners in innovation	0	0	0	1	8
aperam	0	0	0	3	7
INFRABEL	1	2	2	3	3
CARMEUSE	0	0	0	2	2
ArcelorMittal	1	1	6	7	9
TOTAL	***3***	***4***	***10***	***21***	***39***

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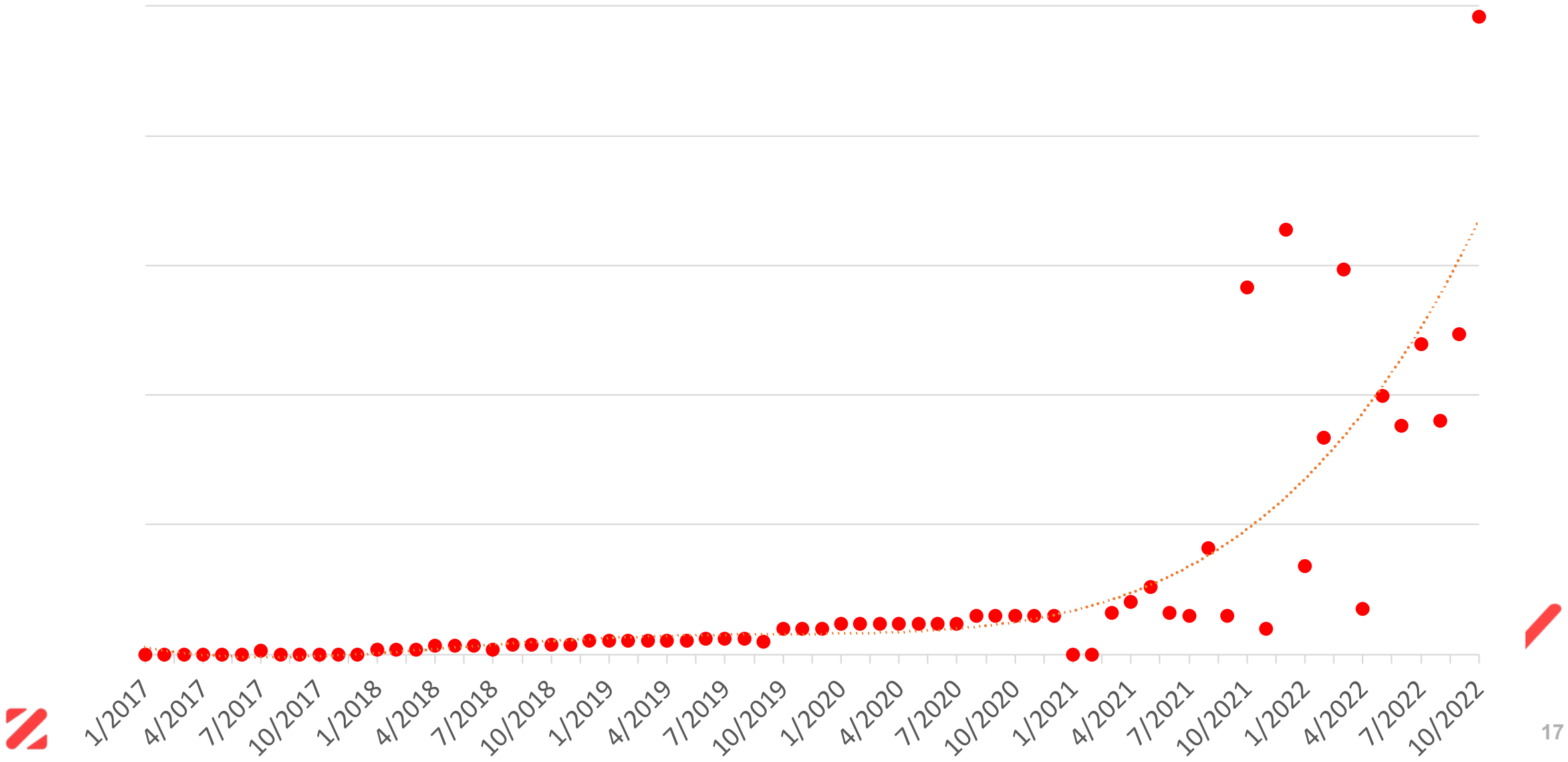
Subscription fees from industrial asset monitoring: (invoiced)



Where are we now?

- Product suite: finalized ✓
- Markets: identified ✓
- Relevant market segments: identified ✓
- Value proposition: proven ✓
- Growing to scale within target customer: validated ✓
- Go-to-market: proven ✓

- **Next stage: scale**

Looking for: Growth energy

- €
- Hands-on SaaS experience

- Already > 400 k€ non-dilutive funding secured
- 2 specific products (white label) under development for Multinationals

Interested in virtual engineers that maximize machine availability and product quality with short time to value?

yves.van.ingelgem@zensor.be
+32 473 35 89 74
@ZensorBe