Content

- Introduction & why track your assets
- What is asset tracking - high level introduction
    - In factory (inc asset monitoring)
    - On site (indoor/outdoor)
    - Cross supply chain (indoor/outdoor/in transit)
- Benefits and cost savings - e.g. streamline your supply chain, get better/longer use out of your assets, don’t lose assets in and out of the factory or in transit, reduction in downtime.
- Understanding and quantifying the value of tracking your asset and building a business case/Connected Factory qualifying tool - e.g. how to calculate how much £ asset tracking will save you
- E2E Asset tracking - Order Tracking + introduction to Elements Technology
- Exploring a number of use cases, environments (e.g. indoor/outdoor) and technologies (LPWAN, Bluetooth, Wi-Fi) - David
- Dyer Engineering case study w/ Rich Larder
- Adopters club intro
- Next steps + BD wrap-up
- Questions

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Digital Catapult – Accelerating early adoption of advanced digital technologies in the UK

Digital Catapult is the UK's leading digital innovation centre, with this aim of accelerating the adoption of digital technologies in the manufacturing and creative industries in the UK, helping develop ecosystems to truly gain value from data.

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Digital Catapult - what we do

CATAPULT Digital

Builds and operates physical and digital facilities

Designs and delivers innovation programmes

Convenes and collaborates on research and development

Shapes and **develops** industry-ready solutions

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Asset and order tracking: The key to delivering value from IoT in industrials settings

Dr. David Pugh and Rukmini Prasad

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The ultimate purpose of tracking assets is to know an asset's exact location and to understand how each one is being utilised.

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Where are you on your asset tracking journey?

Learning
Interested to learn more about the potential of asset tracking

Identification
Identified potential assets and processes to track

Gathering info
Requirements gathering in progress for example, networks and hardware to deploy

Proof of concept
PoC deployment underway

Scaling solutions
PoC complete and looking to scale asset tracking solution

Asset tracking
Actively using asset and order tracking at scale

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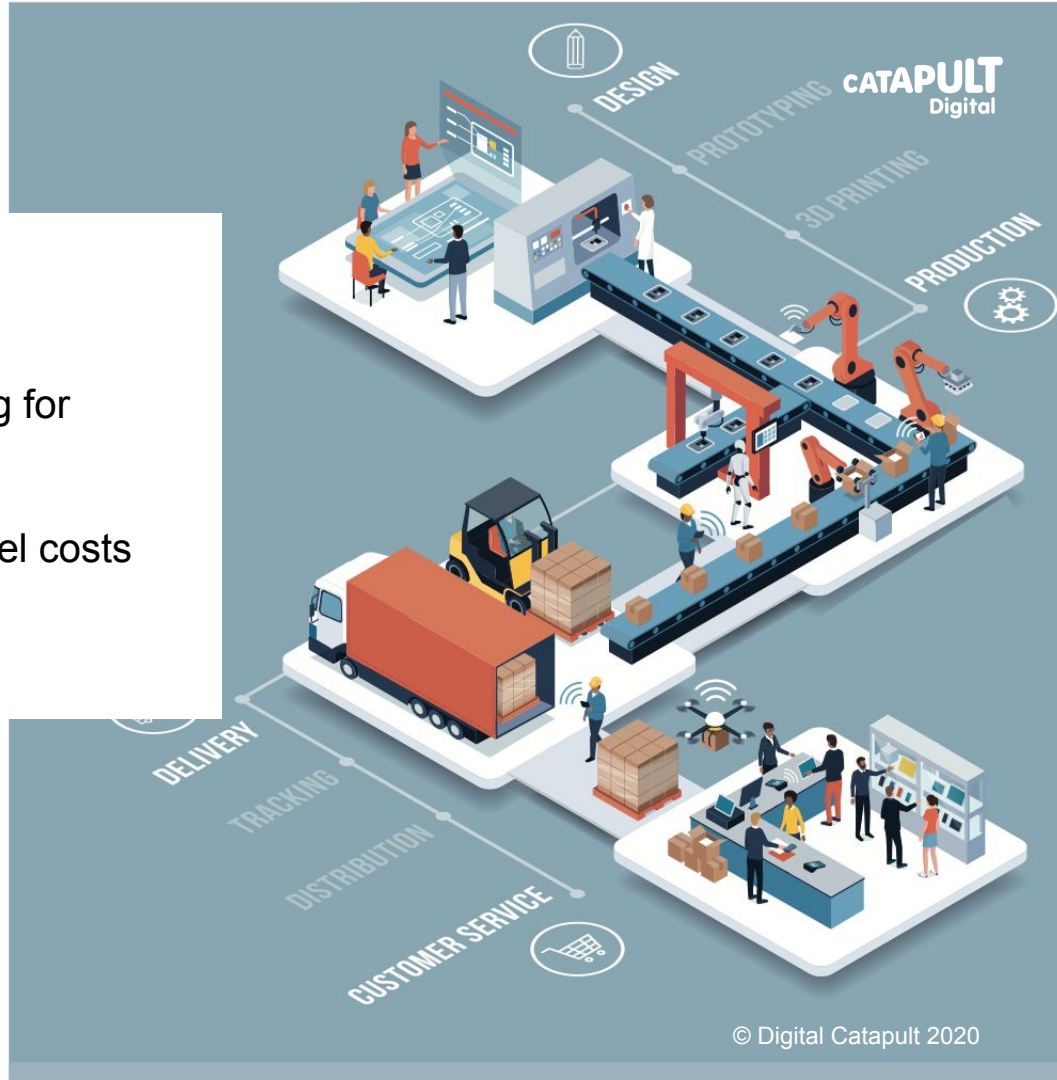
Why track assets

- Better supply-chain visibility
- Improved asset efficiency
- Reduction in downtime spent looking for missing assets
- Reduction in administrative/personnel costs
- Improved customer experience



Asset tracking value add

In addition to tracking locations, IoT devices can also record other actionable data such as:

- Temperature
- Humidity
- Shock
- Magnetic flux

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Categories of asset tracking

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In factory
Tracking an asset across a single indoor facility, reducing time spent searching for items on a shop floor.

Across site
Tracking assets across a large site, identifying where on the site the asset is (which building) and keep historical data about the journey an asset has been on.

Cross supply chain
Tracking assets between suppliers and customers, allows manufacturers to better determine ETA for products arriving to customers and ensures appropriate resources are available on arrival.

Key questions to consider:

- Where is the asset? On site, across a supply chain, cross border?
- How often must location be known?
- What other information is required for example; temperature, shock, humidity?
- Indoor/outdoor tracking?

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Different use cases require different networks

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	Short range wireless	Low Power Wide Area Network (LPWAN)	Cellular Network
Pros	Well established in buildings and consumer electronics	Low Power Low Cost Long Range	High Coverage High Data Rate
Cons	Short Battery Lifetime Short Range	Low Data Rate Emerging Standards	Large Power Requirements High Cost
Use Cases	Localising in buildings, pathfinding, high accuracy positioning	Asset tracking, condition status, alerting systems	In transit, mobile assets and devices, camera feeds
Suitable For	Indoor tracking	On site, cross supply chain	On site, cross supply chain
Key Players	Wi Fi Bluetooth	NB-IoT LoRaWAN sigfox Make Things Come Alive	5G

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Asset tracking - Real-world use cases

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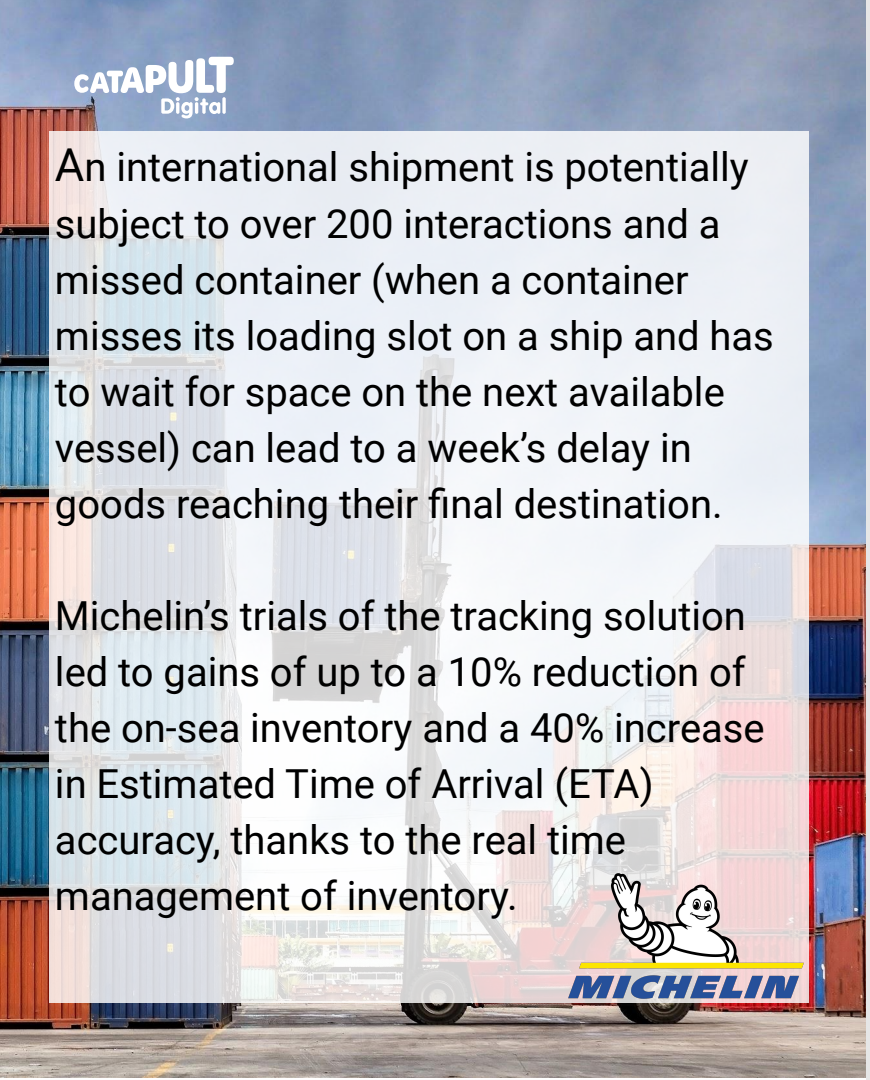

An international shipment is potentially subject to over 200 interactions and a missed container (when a container misses its loading slot on a ship and has to wait for space on the next available vessel) can lead to a week's delay in goods reaching their final destination.

Michelin's trials of the tracking solution led to gains of up to a 10% reduction of the on-sea inventory and a 40% increase in Estimated Time of Arrival (ETA) accuracy, thanks to the real time management of inventory.

LPWAN in global logistics

Hardware deployed:

- International Sigfox Network
- Battery operated trackers attached to pallets

Network technology:

sigfox
Make Things Come Alive

Benefits:

- 10% reduction of on-sea inventory
- 40% Increase in ETA accuracy

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Tracking equipment at large construction sites

Tracking solution:

- Wide Area Network deployed on site
- Single magnetic tacker deployed onto vehicle

Network technology:

LoRaWAN™

Benefits:

- Identification of where industrial assets are on site - significant reduction in time spent looking for assets
- Understanding of utilisation of assets - providing evidence for redeployment of assets to enable optimised operations

Industrial assets such as diggers on large construction sites can go missing, leading to large amounts of time spent locating them as well as an understanding of utilisation. By attaching a device to the asset with a magnetic attachment, users are able to request the GPS position of the asset, as well as information on whether the asset is turned on, active or off though a vibration sensor. This solution requires an LPWAN network to be deployed, requiring a base station to be deployed on site.

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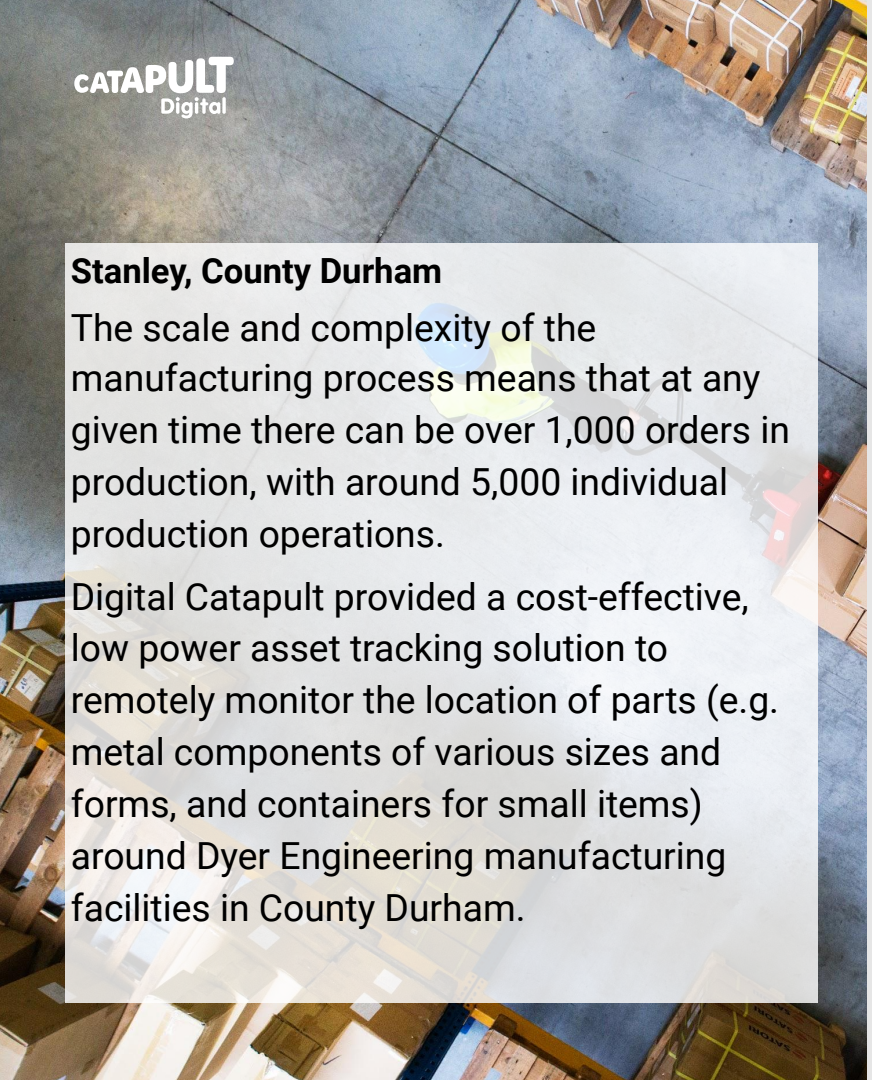

Stanley, County Durham

The scale and complexity of the manufacturing process means that at any given time there can be over 1,000 orders in production, with around 5,000 individual production operations.

Digital Catapult provided a cost-effective, low power asset tracking solution to remotely monitor the location of parts (e.g. metal components of various sizes and forms, and containers for small items) around Dyer Engineering manufacturing facilities in County Durham.

Monitoring assets on the shop floor

Hardware deployed:

- 500 asset tracking tags
- 45 RTLS antennas

Network technology:

Bluetooth®

Benefits:

- Reduction in wasted time and wasted transport usage searching for missing parts
- Reduction in production delays and extended lead times
- Increased machine capacity and throughput

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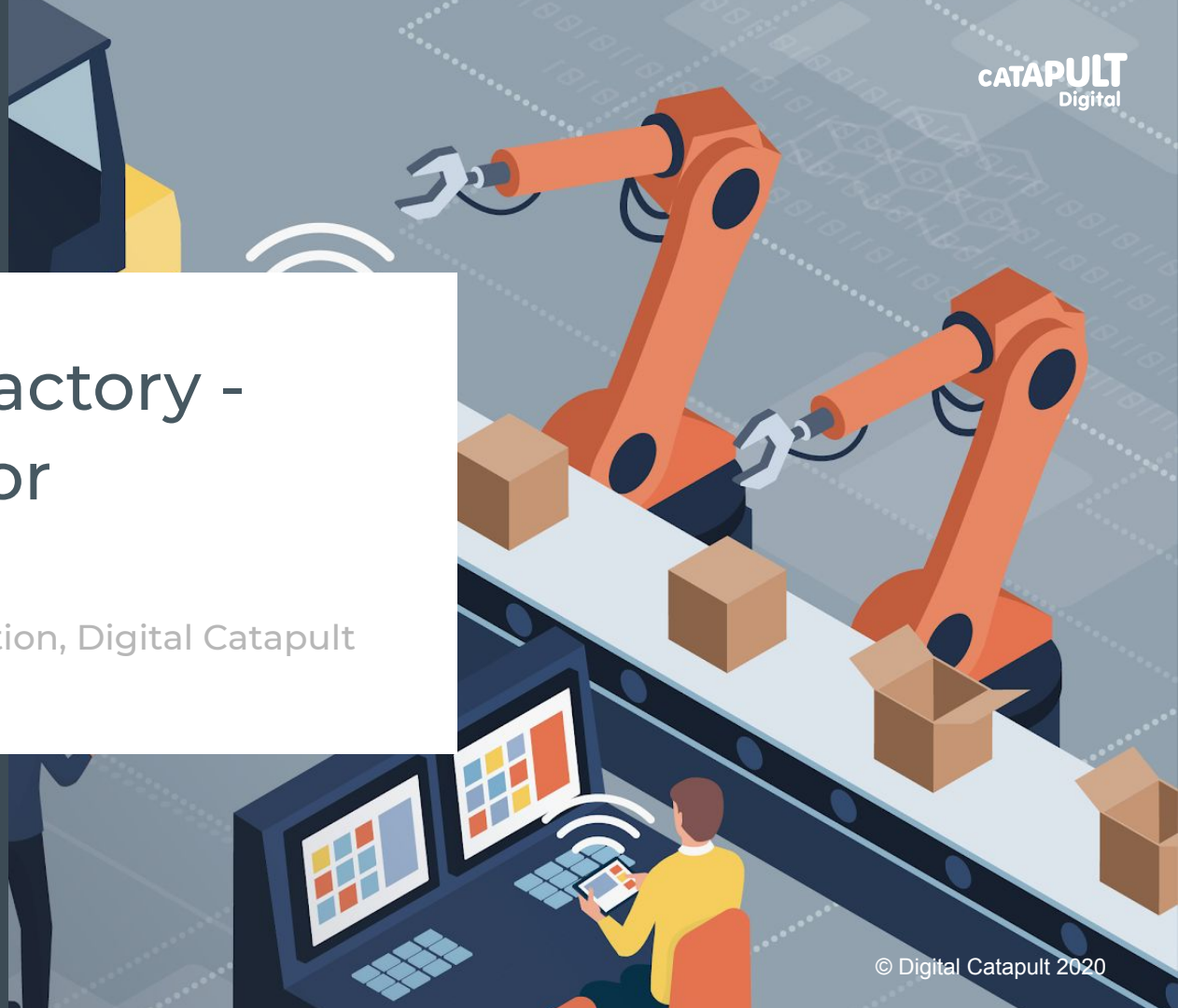
Connected factory - ROI calculator

Peter Karney

Head of Product Innovation, Digital Catapult



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The aim

To show how the application of IoT technologies could be applied to legacy factories to boost productivity

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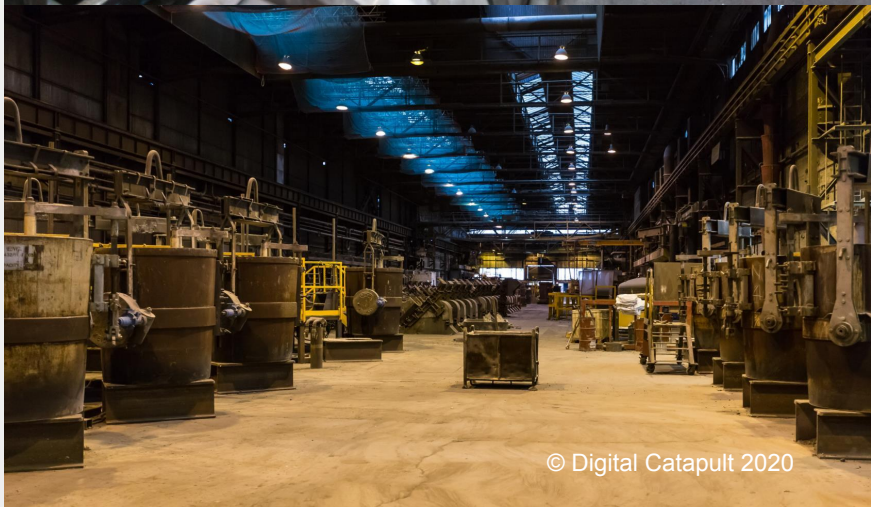
Special Metals Wiggin

Hereford based market Leader in the production of specialist Nickel based alloys for the automotive, aerospace, marine and nuclear industries

£180 million turnover

400+ Employees

Established in 1800’s



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While its product is cutting edge and used by companies across the globe including Airbus, ABB, Westinghouse, Fiat, Rolls Royce and SNECMA.

The facility is vast, definitely legacy and incredibly difficult to update to industry 4.0

Finding stuff is a major challenge

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Gains to be made

Special Metals Wiggin shuts its entire facility four times a year to perform a stock check. Batches of metal and samples are at times misplaced requiring remanufacture to meet the delivery schedules.

£2m - Special Metals Wiggin state that a tracking solution would save them £2 million per year.

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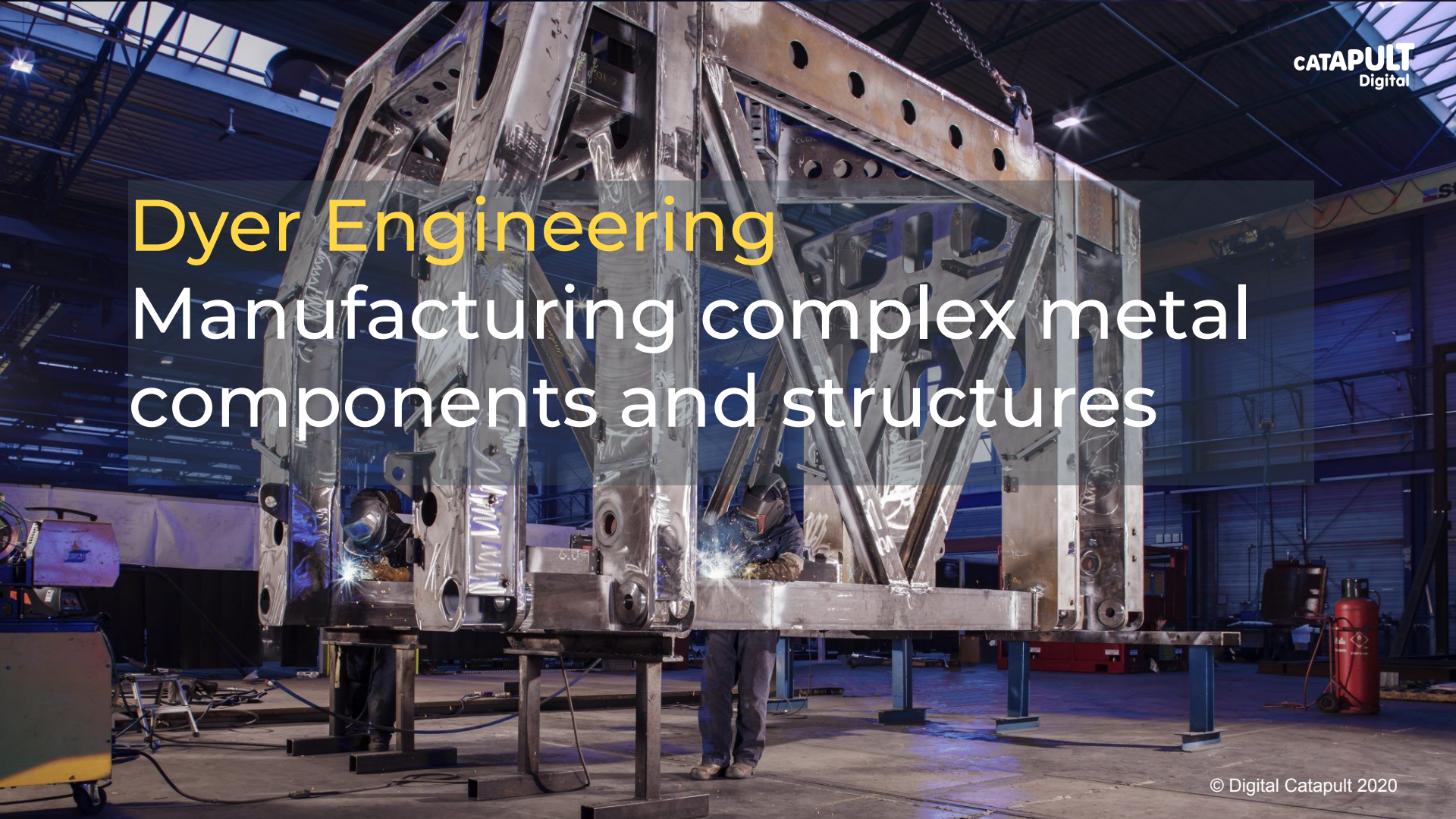

Dyer Engineering

Manufacturing complex metal components and structures

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Dyer Engineering

DYER ENGINEERING

SMARTER STRONGER TOGETHER

Based in County Durham in the North East

Fabrication and machining businesses with wide-ranging capabilities to manufacture metal components and structures

£12 million turnover

150+ Employees

Established in 1977

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Gains to be made

DYER ENGINEERING

SMARTER STRONGER TOGETHER

Once again finding components within their facility is a major cause of delay

5% - estimated five percent improvement in productivity overall – equivalent to eight people.

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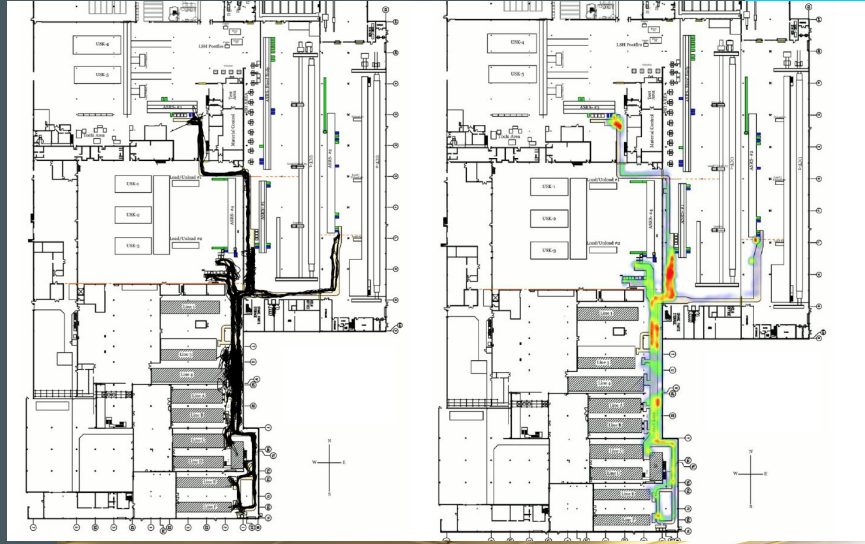

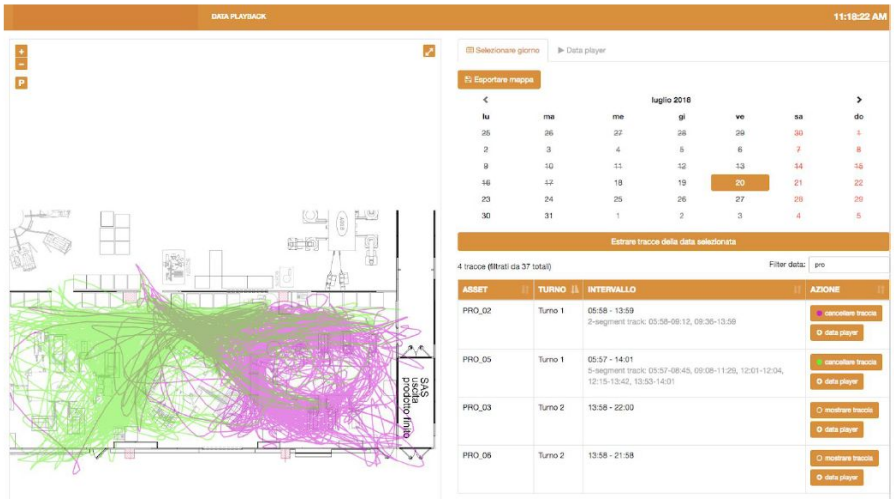
DATA PLAYBACK
11:18:22 AM
Selezionare giorno
Data player
Esportare mappa
luglio 2016
lu ma me gi ve sa do
Estrarre tracce della data selezionata
4 tracce (filtrati da 37 totali)
Filter data:
ASSET
TURNO
INTERVALLO
AZIONE
PRO_02
Turno 1
05:58 - 13:59
2-segment track: 05:58-09:12, 09:36-13:58
cancellare traccia
data player
PRO_05
Turno 1
05:57 - 14:01
5-segment track: 05:57-08:45, 09:08-11:29, 12:01-12:04, 12:15-13:42, 13:53-14:01
cancellare traccia
data player
PRO_03
Turno 2
13:58 - 22:00
mostrare traccia
data player
PRO_06
Turno 2
13:58 - 21:58
mostrare traccia
data player

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The result

Items can be found
any time, every time

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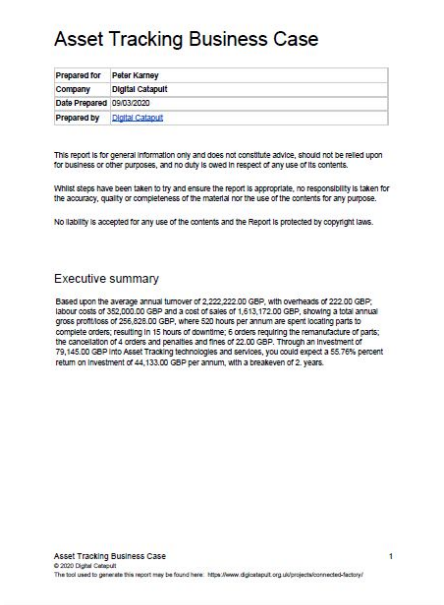
Asset tracking ROI calculator

www.digicatapult.org.uk/projects/connected-factory



Asset Tracking Business Case

Prepared for	Peter Karney
Company	Digital Catapult
Date Prepared	09/03/2020
Prepared by	Digital Catapult

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Executive summary

Based upon the average annual turnover of 2,222,222.00 GBP, with overheads of 222.00 GBP; labour costs of 382,000.00 GBP and a cost of sales of 1,613,172.00 GBP, showing a total annual gross profit/loss of 256,828.00 GBP, where 520 hours per annum are spent locating parts to complete orders; resulting in 15 hours of downtime; 6 orders requiring the remanufacture of parts; the cancellation of 4 orders and penalties and fines of 22.00 GBP. Through an investment of 79,145.00 GBP into Asset Tracking technologies and services, you could expect a 55.76% percent return on investment of 44,133.00 GBP per annum, with a breakeven of 2. years.

Asset Tracking Business Case 1

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The tool used to generate this report may be found here: https://www.digicatapult.org.uk/projects/connected-factory/

Problem

As a company, we have an issue in keeping track of all the parts that are constantly moving about our premises. This requires staff members to look for parts in order to complete orders. On occasion, to meet order deadlines we remake parts that cannot be found easily, and in dire cases, we have lost orders and had to accept penalties and fines.

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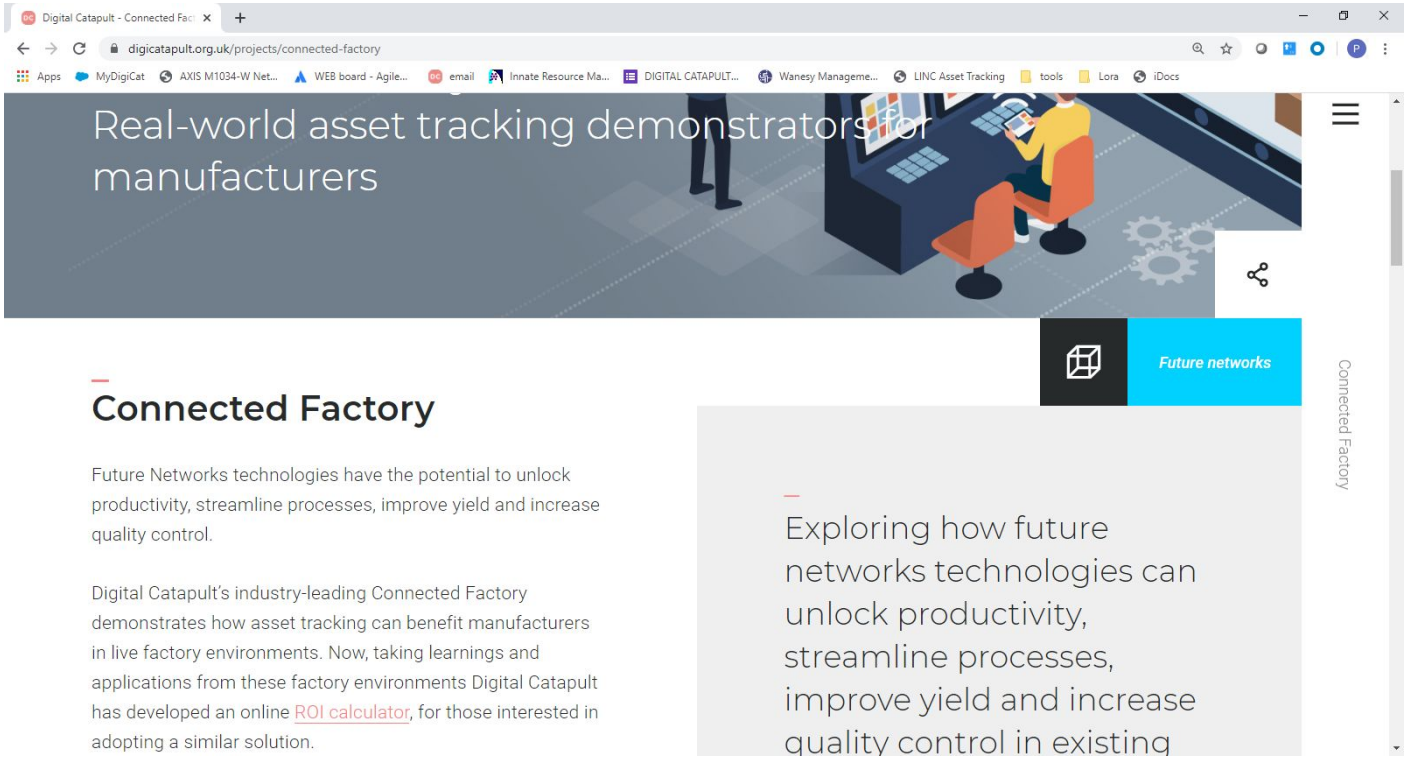
Try the asset tracking ROI calculator

www.digicatapult.org.uk/projects/connected-factory



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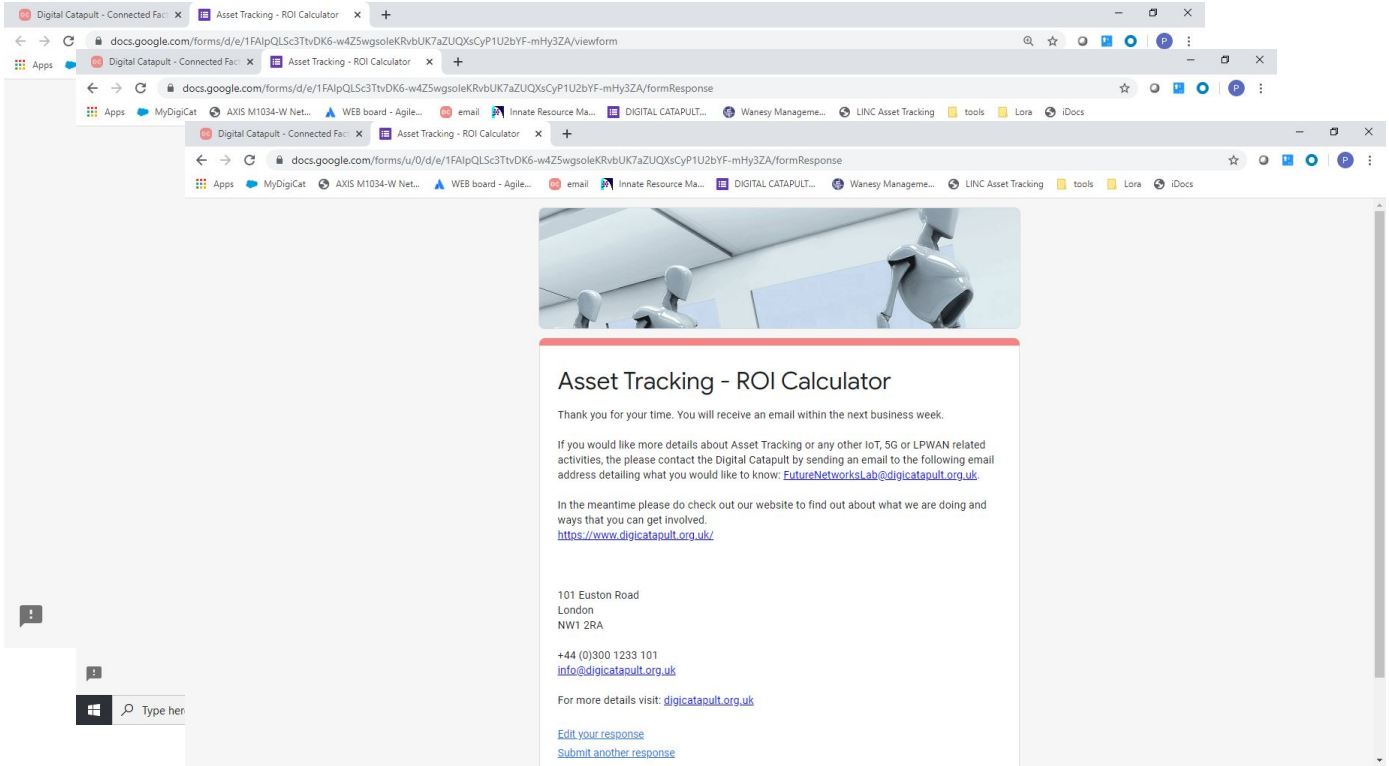
Try the asset tracking ROI calculator

www.digicatapult.org.uk/projects/connected-factory



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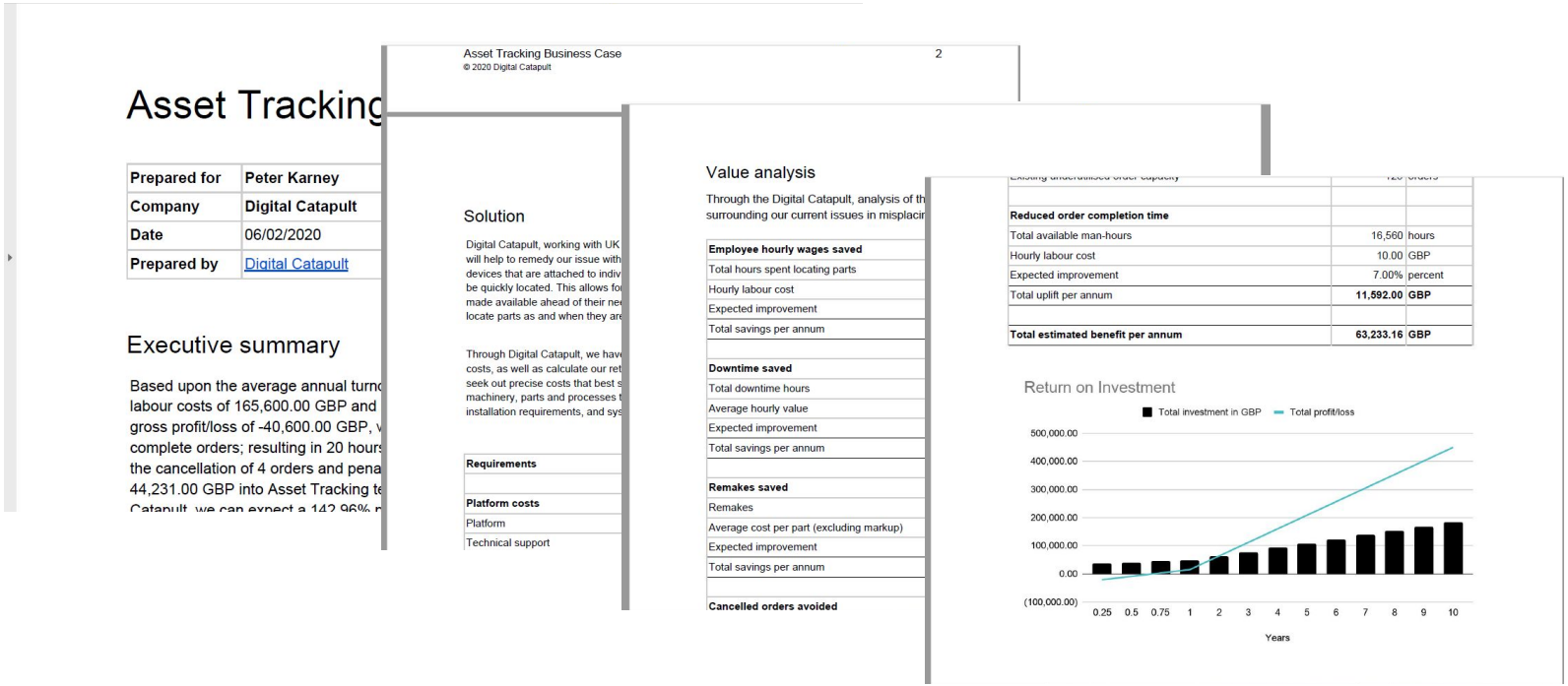
Try the asset tracking ROI calculator

www.digicatapult.org.uk/projects/connected-factory



Asset Tracking

Prepared for	Peter Karney
Company	Digital Catapult
Date	06/02/2020
Prepared by	Digital Catapult

Executive summary

Based upon the average annual turnc
labour costs of 165,600.00 GBP and
gross profit/loss of -40,600.00 GBP, v
complete orders; resulting in 20 hours
the cancellation of 4 orders and pena
44,231.00 GBP into Asset Tracking te
Catapult, we can expect a 142.96% r

Asset Tracking Business Case 2
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Solution

Digital Catapult, working with UK
will help to remedy our issue with
devices that are attached to indiv
be quickly located. This allows fo
made available ahead of their ne
locate parts as and when they are

Through Digital Catapult, we have
costs, as well as calculate our ret
seek out precise costs that best s
machinery, parts and processes t
installation requirements, and sys

Requirements
Platform costs
Platform
Technical support

Value analysis

Through the Digital Catapult, analysis of th
surrounding our current issues in misplacir

Employee hourly wages saved
Total hours spent locating parts
Hourly labour cost
Expected improvement
Total savings per annum
Downtime saved
Total downtime hours
Average hourly value
Expected improvement
Total savings per annum
Remakes saved
Remakes
Average cost per part (excluding markup)
Expected improvement
Total savings per annum
Cancelled orders avoided

Reduced order completion time		
Total available man-hours	16,560	hours
Hourly labour cost	10.00	GBP
Expected improvement	7.00%	percent
Total uplift per annum	**11,592.00**	**GBP**
Total estimated benefit per annum	**63,233.16**	**GBP**

Return on Investment

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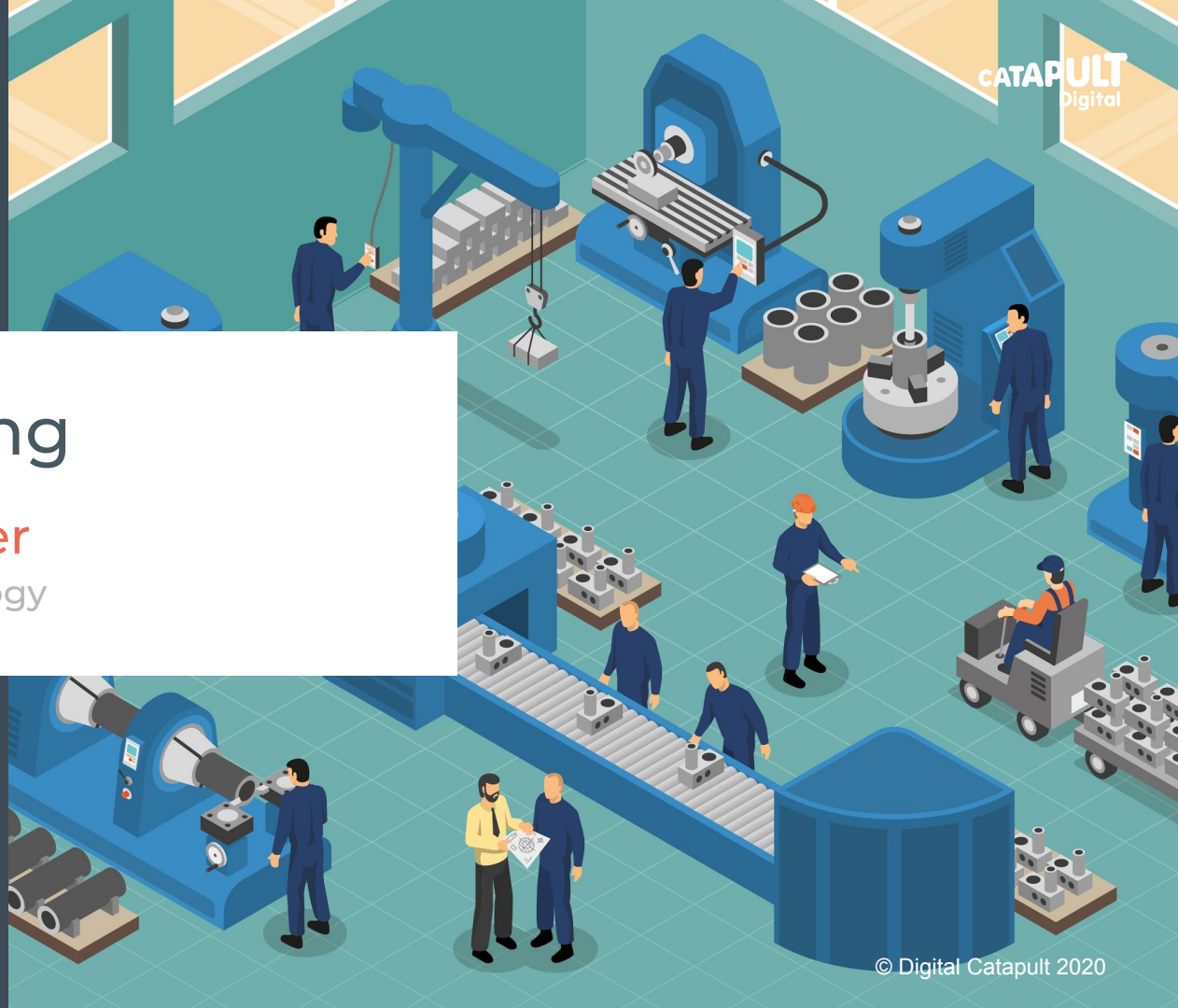
elements
technology



Order tracking

Dr. Joe Handsaker

CEO, Elements Technology

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Order and asset tracking answers four questions:

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Who?

This person has...

What?

... performed this action...

Where?

...at this location...

When?

...on this date and time.

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Three levels of order tracking
based on how information is captured and digitised

01	Manually captured Manually digitised	typing information from dockets into an excel document
02	Manually captured Automatically digitised	capturing data digitally at source from a phone or tablet
03	Automatically captured Automatically digitised	capturing data without any input required, using sensors

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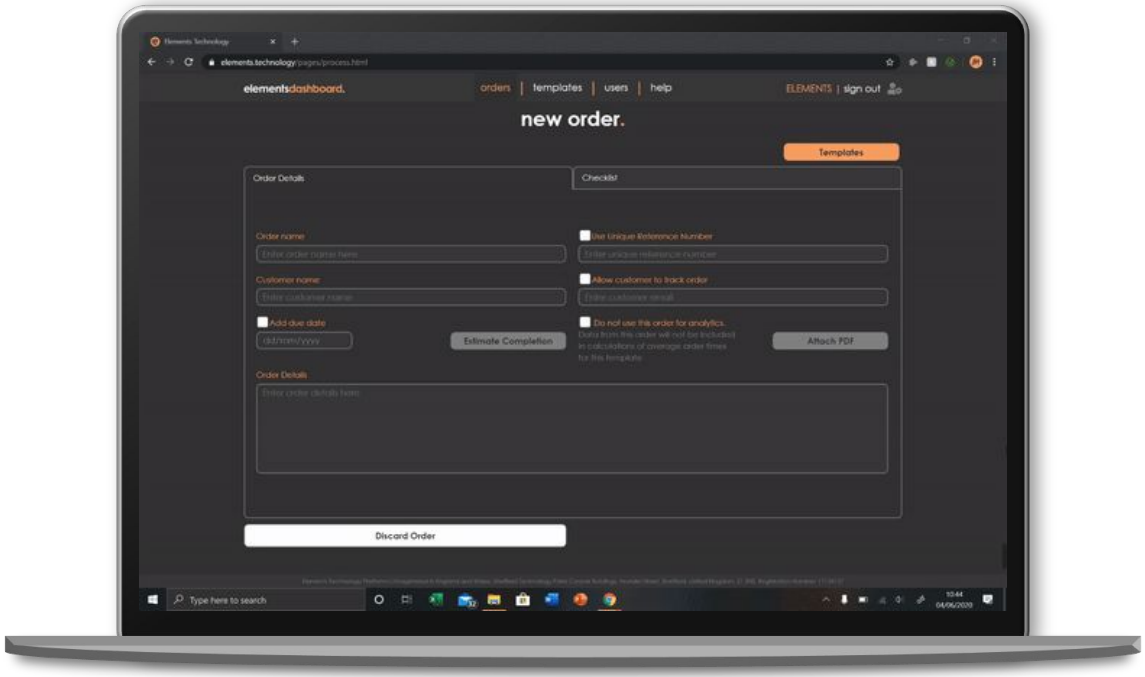

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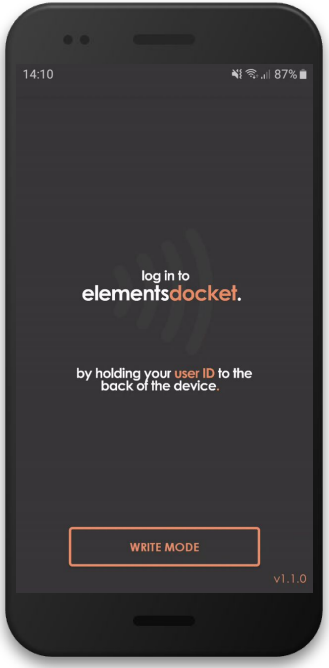

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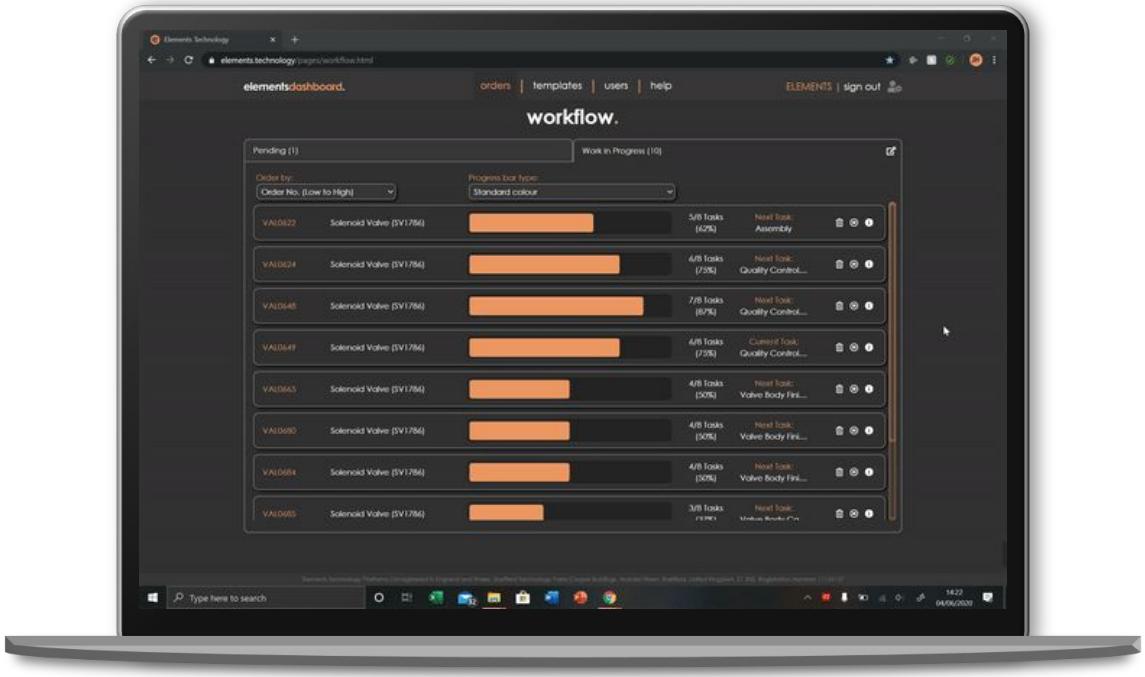

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Getting started with asset and order tracking

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Getting started with asset tracking - things to consider

What assets do you want to track?

- What goes missing?
- What is the value?
- How often do you need to know the location or condition?
- What processes do you have in place today?

Where do you want to track assets?

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Next steps

- Identify assets + value/KPI/success metrics
- Business case + ROI calculator
- Understand technology requirements on site
- Deploy technology + evaluate success metrics
- Consider at scale deployment

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Moving from PoC to scaled product

Following a successful PoC deployment, Digital Catapult can support in progressing the prototype to a scaled launch. Our teams will work collaboratively with yours to assess:

- Most effective technology solutions to deploy at scale (i.e. whether a mix of technology standards could be more beneficial)
- Data management - harnessing value from the data you are collecting
- Business case for further internal investment
- KPIs for at-scale deployment
- Service design capabilities to support the full enterprise system design
- Highly-skilled advice around technology deployment and sensor selection at scale

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Introducing -
IoT Discovery Programme

By running a series of bespoke workshops and events, introductory seminars, tailored literature, time with technical experts in the field and through introducing club members to relevant partners in the tech ecosystem who can solve their business challenges quickly and efficiently.

Programme enabling IoT adopters to become i**nformed customers and more successful in making the right IoT technology choices to digitally transform their business.**

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IoT Discovery Programme: Who?

Four distinct industry-specific ‘clubs’ to ensure content is **tailored**, **relevant** and brings together an ecosystem of industry partners, startups and Digital Catapult to drive adoption of advanced technologies.

Participants will be IoT leads in Industrial companies in the below industries managing initial IoT deployments.

Aerospace & defence

Energy & utilities

Food & drink

Foundation industries

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Connect with us to discuss:

- Asset tracking + ROI calculator and report
- PoC roll-out and on-site trials
- IoT Discovery Programme

Contact:

rukmini.prasad@digicatapult.org.uk,
david.pugh@digicatapult.org.uk

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Q&A panel discussion

Please ask questions through the zoom chat function

Marco Da Silva
(G-Lok Systems)

Rukmini Prasad
(Digital Catapult)

Dr. Nick Wright
(Digital Catapult)

Dr. Joe Handsaker
(Elements Technology)

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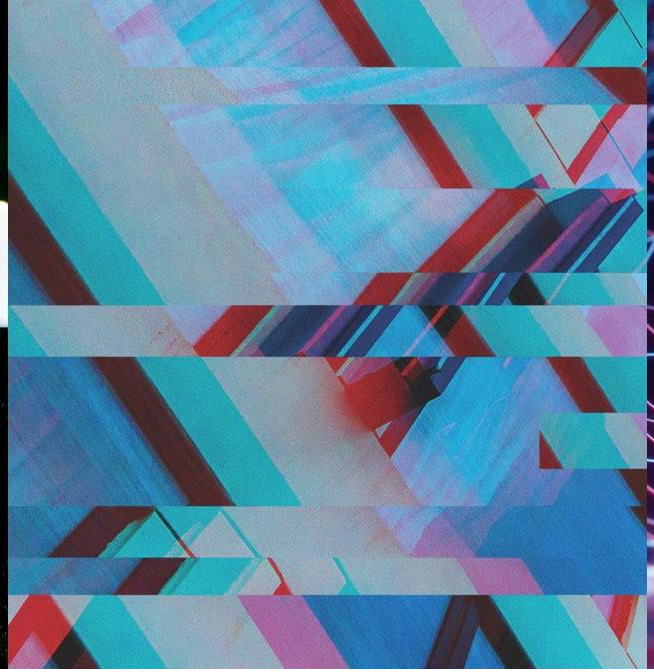

Thank you

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