H2020 Brokerage Event on ICT, Advanced Materials and Manufacturing
4th July
Dublin Ireland
DEMYSTIFY, DERISK, DELIVER

emerging technologies for manufacturing

WHAT WE OFFER

Industrial pilot lines and test beds
Highly Skilled Researchers

Prototyping services
Industry networks

Access to national funding and European R&D
Large-scale collaborative Research

H2020 Brokerage Event on ICT, Advanced Materials and Manufacturing 4th July 2019 Dublin Ireland
Capacity for industry

- 53 Highly Skilled Researchers
- 500+ Years of Combined Industry Experience
- 45,000 sq. ft. of R&D Pilot Lines and Development Labs
- State-of-the-Art Production Equipment in Additive Manufacturing

Industry Impact

- 40+ Active Research Partnerships with Industry
- €8.5m in Competitive R&D Funding Won for Industry-focused Research
- CM’s saved in productivity and efficiency improvements for Industry

Connectivity

- Irish leadership on 12 major EU decision making bodies
- Strategic Partnerships with 8 Academic Institutes
- 100+ Industry Network

Training and Dissemination

- 700+ Attendees at IMR Courses and Dissemination Events
- 200+ Students Involved in STEM Programs

H2020 Brokerage Event on ICT, Advanced Materials and Manufacturing 4th July 2019 Dublin Ireland
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IMR Research Technology Case-Studies
Energy Project ICEhOuSE

To develop an optimal control strategy to reduce the overall power consumption of industrial chilled water systems while ensuring system reliability and controllability.

➢ Based on an Industrial Internet of Things (IIoT) System architecture
➢ Leverages site existing datasets
  • Building Management System (BMS)
  • Energy Management Systems (EMS)
  • Programme logic controllers (PLC)
➢ Generates heuristic models of the system components
➢ Produces an optimal control strategy for chiller sequencing load balancing based on the chiller modelled efficiencies.
➢ Visualises operational focused datasets

IMR PI david.mccormack@imr.ie
Project ICEhOuSE Simulation Results and User Interface

User Interface displays key data from multiple systems displayed

<table>
<thead>
<tr>
<th>2 Month period (Mar-Apr 2017)</th>
<th>Total kWhr</th>
<th>tCO2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard Control</td>
<td>342,117</td>
<td>140.9</td>
</tr>
<tr>
<td>Optimal Control</td>
<td>158,817</td>
<td>65.4</td>
</tr>
<tr>
<td>Saving</td>
<td>183,299</td>
<td>75.5</td>
</tr>
</tbody>
</table>

Initial results show up to 20% savings achievable in an ICT factory

Results for pilot in medical device facility show 40% savings achievable
**Problem** 30% of all knowledge accumulated by employees is taught and documented. Where is the other 70%?
- It is the lessons learnt
- It is bespoke to the company and the site
- It is experience
- It is hard won and expensive to acquire
- It is buried in SharePoint and share drive document repositories

**Solution** Support formal and informal tacit knowledge.
- Upload and share Video, Images, Audio plus all standard docs on one platform
- Give the user what they need, when they need it with one powerful search
- Allow your experts to share and hone their knowledge quickly and intuitively.

**Key Features**
- **Powerful Search** algorithms tailored for your role, specific to your team, projects and processes
- **Workgroups** connect users to knowledge Artefacts. Apply an approval loop for assured content quality!
- Never miss anything with our Intelligent Knowledge Recommender System
- Get straight to the point with our QR codes.

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Problem/opportunity hypothesis?
To optimise for manufacture the form of a component to withstand real world load cases

Research Question
Can additive manufacturing be used to reduced the weight of a component of this size while maintaining its core functional

Why is it important
- Part design for optimised functionality
- Benefits for end customer, lighter part and therefore reduced fuel consumptions
- Design and manufacture without the restrictions of traditional manufacturing.
- Topology optimised parts functionally are based on the specific user requirements, leading to innovation and manufacturing capabilities previously not possible with traditional manufacturing.

IMR PI  John.enright@imr.ie  sean.McConnell@imr.ie
Cobotics Process Integration - End of Line Packaging

**Problem/opportunity hypothesis?**
To optimise speed and efficiency on an existing production line in order to meet increasing customer demand and cost reduction targets

**Research Question**
Can Cobotics be used to Introduce Collaborative Robots to a production area, with minimal impact

**Context**
- Fully automated production line with manual box-off & packaging

**Goal**
- Form
- Fill
- Tape (top & bottom) and
- Palletise shipper box

**Challenges**
- Constrained work space
- Multiple box configurations

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Data Analytics Process

No point developing a solution for here when you as an organisation are here

➢ Predictive Maintenance Solutions

➢ Simulation
  ➢ planning tools for line planning & both machine and resource simulation

➢ Optimisation –
  ➢ developed Greybox scheduling tool

➢ Data Visualisation – interactive vis of e.g. mfg floor activities, dealing with live data streams from sensors

➢ Root cause analytics – analysing an area of a line to determine causes of scrap and implementing fix – new sensors & new SPC limits

➢ Sensorisation Implementations of IoT sensors based on needs assessment

Education for industry on data optimisation
• Artificial Intelligence Scheduling

• Optimal **scheduling** ensures that as a business you are getting maximum value from your resources.

• It’s a **complex task**

• Up to **40% savings** have been demonstrated using optimisation – so why aren’t all manufacturing companies using it? What else is needed?

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Augmented Reality – Virtual Reality – The Unknown, Unknown

Manufacturing >15% Market Share

• Discrete Manufacturing 11%

• Process Manufacturing 5%

• Growing year on year

IPP – 10 companies with Aim to create an evaluation framework and XR Hardware agnostic solution to support companies in the adoption of XR Technology

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IMR European Network growing weekly
Coordination of Industry 4.e CSA ECSEL JU

This project has received funding from ECSEL Joint Undertaking (JU) under Grant agreement 830845. The JU receives support from the European Unions Horizon 2020 research and innovation programme and Ireland, Finland, Spain and Germany.
Coordination of Industry 4.e CSA ECSEL JU

ENABLING EUROPEAN INDUSTRY TO ACHIEVE DIGITAL TRANSITION AND STRONG COMPETITIVENESS

ACTIVITIES AND EXPECTED OUTCOMES:
• Promoting European Digital Industry Leadership and European team spirit
• Recommendations on the future of the Industrial Digitalisation roadmap
• Catalysing cooperation and reducing fragmentation among all stakeholders and relevant H2020 projects
• Linking projects, national and regional activities, including SME engagement for Digital Industry
• Acceleration of uptake of project results, increasing industrial and social impact
• Contributing to standardisation and policy
• Boosting cross-cutting activities
• Engaging specialists and the general public

CSA-INDUSTRY4.E
SUPPORTING SUCCESSFUL IMPLEMENTATION OF THE INDUSTRY4.E LIGHTHOUSE

The CSA-Industry4.E team will work in close cooperation with:
• LightHouse Initiative Advisory Service (LIASE)
• Industry4.E Lighthouse projects
• BPMIT project/lighthouse projects
• All stakeholders – including SMEs, other European, regional and national projects, policy-makers and the public.

Get in contact today:
sinfo@industry4e.eu

INDUSTRY4.E Lighthouse Initiative
Regional Digital Innovation Hub - MIDIH

21 Participants across Europe
• 3 Pan European Digital Innovation Hubs,
• 2 Regional Digital Innovation Hubs,
• 9 Competence Centre and
• 2 Teaching Factories.

Pan-EU DIH serving needs of manufacturing SMEs across all Europe.
Based on I4MS Mentoring and Coaching program,
Most advanced and promising Regional Manufacturing DIHs in the CPS/IOT domain (from Scotland and Ireland) have been engaged to support the implementation of their business plan.

MIDIH is a project funded by the European Union Framework Programme for Research and Innovation Horizon 2020 under Grant agreement nº 767498.

Call for Proposals for Data driven applications and experiments in CPS/IOT [https://midih.eu/opencall_2.php](https://midih.eu/opencall_2.php)
We accelerate factories through robotics.

DIH² is a network of 26 European Digital Innovation Hubs (DIHs). Our objective is to grow this network to over 170 DIHs by 2022.

The ambition of the project is to:
- Improve the cost-effectiveness of advanced robotics solutions.
- Drive growth of the European manufacturing robotics market.
- Generate innovation that maximises productivity and optimises agility in over 300,000 manufacturing SMEs and Mid-Caps across the EU.

Through two rounds of Open Calls, in total 26 consortia composed of up to 3 members including SMEs and Technology Providers, will be selected to participate in a Technology Transfer Program.

The beneficiaries will receive financial support, training and other technical and business services to ensure rapid commercialisation of their solutions.

First Stage Open Call: July 2019

We are here to support your application!
Get in touch today: sabine.giron@imr.ie
## H2020 ICT Calls of Interest (2019-2020)

<table>
<thead>
<tr>
<th>Call ref</th>
<th>Type</th>
<th>Call Topic</th>
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<tbody>
<tr>
<td>ICT-38-2020</td>
<td>RIA</td>
<td>Artificial intelligence for manufacturing</td>
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<tr>
<td>ICT-48-2020</td>
<td>(RIA)</td>
<td>Towards a vibrant European network of AI excellence centres</td>
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<tr>
<td>ICT-48-2020</td>
<td>(CSA)</td>
<td>Towards a vibrant European network of AI excellence centres</td>
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<tr>
<td>ICT-54-2020</td>
<td>(RIA)</td>
<td>Blockchain for the Next Generation Internet</td>
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<tr>
<td>ICT-56-2020</td>
<td>(CSA)</td>
<td>Next Generation Internet of Things</td>
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<td>DT-ICT-03-2020</td>
<td>(CSA)</td>
<td>I4MS (phase 4) - uptake of digital game changers</td>
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<td>DT-ICT-03-2020</td>
<td>(IA)</td>
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<td>DT-ICT-05-2020</td>
<td>(IA)</td>
<td>Big Data Innovation Hubs</td>
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<td>ICT-46-2020</td>
<td>(RIA)</td>
<td>Robotics in Application Areas and Coordination &amp; Support</td>
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<td>ICT-47-2020</td>
<td>(RIA)</td>
<td>Research and Innovation boosting promising robotics applications</td>
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<tr>
<td>ICT-49-2020</td>
<td>(IA)</td>
<td>Artificial Intelligence on demand platform</td>
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## H2020 NMPB Calls of Interest (2019-2020)

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<th>Call ref</th>
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<tr>
<td>DT-FOF-09-2020</td>
<td>(RIA)</td>
<td>Energy-efficient manufacturing system management</td>
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<td>DT-FOF-10-2020</td>
<td>(IA)</td>
<td>Pilot lines for large-part high-precision manufacturing</td>
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<td>DT-FOF-11-2020</td>
<td>(IA)</td>
<td>Quality control in smart manufacturing</td>
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<td>DT-SPIRE-11-2020</td>
<td>(CSA)</td>
<td>Artificial Intelligence and Big Data Technologies for Process Industries</td>
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## H2020 Energy Calls of Interest (2019)

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<th>Call Topic</th>
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<tbody>
<tr>
<td>EE13</td>
<td>(IA)</td>
<td>Enabling next-generation of smart energy services valorising energy efficiency and flexibility at demand -side as energy resource</td>
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<tr>
<td>RES7</td>
<td>(RIA)</td>
<td>Solar Energy in Industrial Processes</td>
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<tr>
<td>EE6</td>
<td>(CSA)</td>
<td>Business case for industrial waste heat/cold recovery</td>
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<tr>
<td>EE8</td>
<td>(CSA)</td>
<td>Capacity building programmes to support implementation of energy audits</td>
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The Pitch

Partners Profile
- European Network
- Irish Academics
- Industrial Partners
  - SME’s
  - MNC’s

ICT and FoF
- AI
- IoT
- Data Analytics
- Robotics

Energy
- Sustainable
- Energy Efficiency

What we Offer
- Competencies in Thematic areas.
- Test Bed Facilities
- WP Leader capability
- Industrial Network
THANK YOU!

Any questions?

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