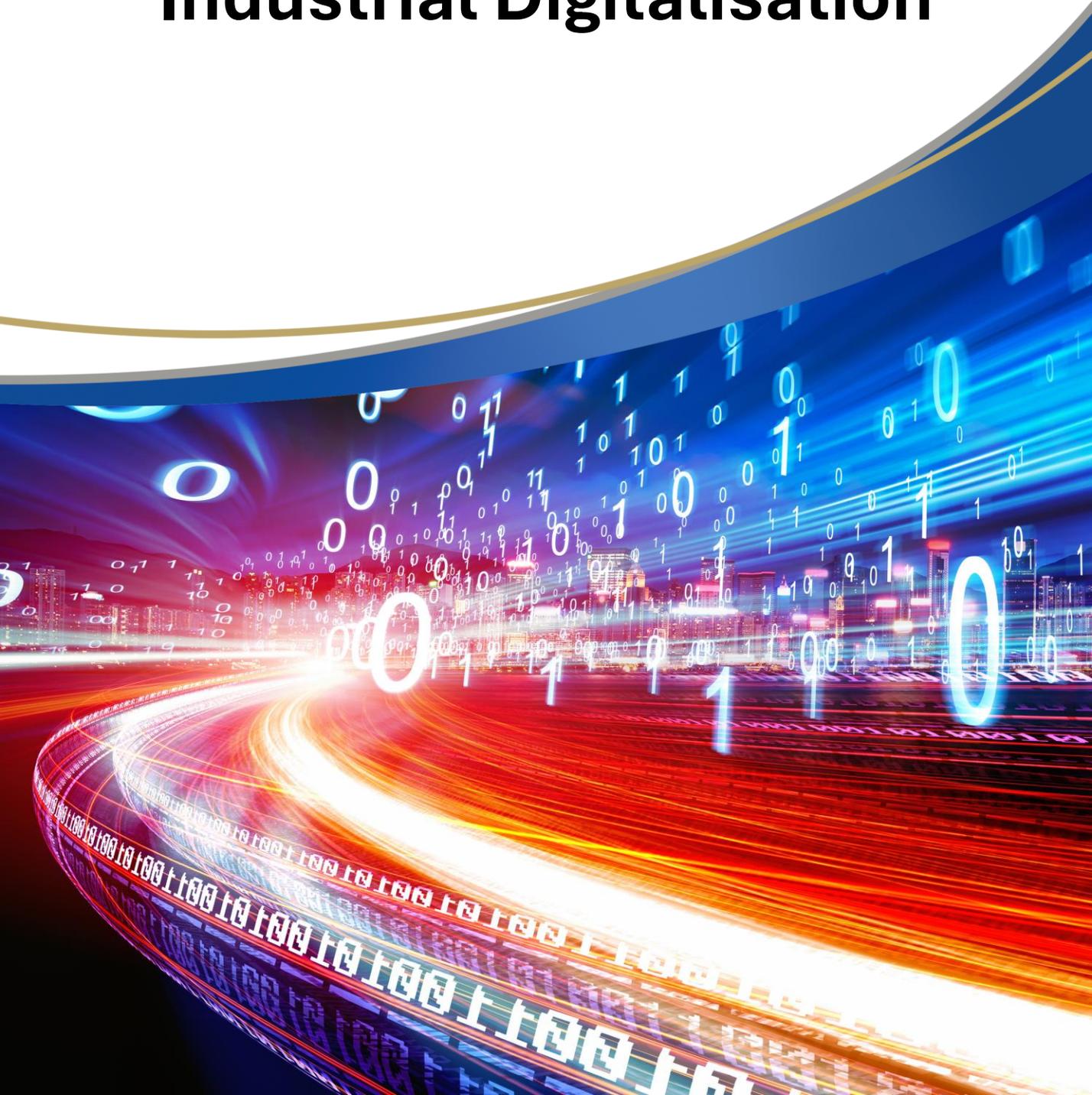




**Materials
Processing
Institute**

Services Portfolio

Industrial Digitalisation



Industrial Digitalisation Services

Services	Page
<ul style="list-style-type: none">- Process Audits- Process Optimisation- Process Data Collection and Storage- Big Data Analytics- Wireless Sensor Development- Industrial Internet of Things Networks- Digital Twins- Machine Learning Models for Process Optimisation- Software Engineering- Thermal Audits of Industrial Processes- Adaptive Design of Experiments with Machine Learning Models	



Industrial Digitalisation

Process Audits

Process audits are carried out to identify opportunities to improve current processes including the application of new sensors, controls systems and machine learning models.

Process Optimisation

Analysis of existing process data and process simulations are used to optimise industrial processes. Additional measurements are used where process information is lacking either for investigative tests or as permanent additions. Control systems and algorithms are modified to deliver improved yield, productivity and quality.

Process Data Collection and Storage

Mature industries often have disparate legacy systems where data is siloed and unobtainable. The Materials Processing Institute can provide a system to collect this data and create a single source of information from the various instruments, sensors, and PLCs found within the foundation industries. The historical data is then visible over the company network for process, administrative and technical staff to view.

Big Data Analytics

Analysing large sets of timeseries process data to draw conclusions and inform continuous improvement activities. This includes data visualisation and model building.



Industrial Digitalisation

Wireless Sensor Development

Application of wireless sensor technologies within the manufacturing and process industries. The Materials Processing Institute can develop wireless sensors to operate in harsh and difficult environments where off the shelf systems would not operate. In addition, the Institute has the knowledge and experience to design the wireless network to match data transmission and range requirements.

Industrial Internet of Things Networks

The connection of data via Message Queues from multiple devices (PLCs, sensors, analytical machines, business systems and databases) into an Internet of Things (IOT) network allows data to be used by all of your systems for applications such as process visualisation & optimisation, data analytics, digital twins, and machine learning models.

Digital Twins

The creation of a Cyber Physical System where the cyber part is a mathematical process model which is updated in real-time with data from your Internet of Things (IOT) network, allows process simulation, optimisation, scenario modelling and training to be done live.



Industrial Digitalisation

Machine Learning Models for Process Optimisation

Development of bespoke Machine Learning models tailored to customer's needs to support process optimisation and provide a valuable insight into hidden relationships amongst process variables. This can result in a reduction in waste and energy usage.

Software Engineering

All of our digital solutions involve software. Often this means designing and building new software to capture data, transfer it between different systems such as manufacturing and administration, store it securely in a database and present it in a form more suitable to the intended user. Good software engineering requires the careful consideration of users' specific needs, a well-thought-out design, and usable documentation – just as much as well written code.

Thermal Audits of Industrial Processes

Process audits through a combination of thermal imaging and using embedded thermocouples to improve thermal efficiency and save energy.

Adaptive Design of Experiments with Machine Learning Models

Where experiments are expensive and time-consuming, achieving target outcomes is difficult. With machine learning models based on existing data and initial experiments, we can adaptively design experiments to achieve targets and reduce uncertainty.

Full Services Portfolio

Advanced Metals & Green Steelmaking

- Green Steel
- Product Development
- Process Improvement
- Extra

Advanced Materials Development

- Custom Alloy Development
- New Steel
- Supporting R&D
- Additive Manufacturing & Powder Metallurgy
- Additional Services

Characterisation and Analysis

- Characterisation and Analysis

Critical Raw Materials

- By-product Valorisation
- End of Life Process Development
- Mine Tailing Valorisation
- Piloting /Testbed Hosting
- Process Scale-up
- Process Optimisation

Sustainable Cement and Concrete

- Product Development
- Process Improvement

Powder Analysis and Additive Manufacturing

- Powder Analysis
- Additive Manufacturing
- Powder Processing

Energy and Process Decarbonisation

- Feasibility Studies
- Energy and Emission Optimisation
- Process Optimisation
- Leveraging Facilities

Facilities and Equipment

Full Services Portfolio

Industrial Digitalisation

- Process Audits
- Process Optimisation
- Process Data Collection and Storage
- Big Data Analytics
- Wireless Sensor Development
- Industrial Internet of Things Networks
- Digital Twins
- Machine Learning Models for Process Optimisation
- Software Engineering
- Thermal Audits of Industrial Processes
- Adaptive Design of Experiments with Machine Learning Models

Facilities and Equipment

Training

Processes

- Ironmaking
- Desulphurisation of Iron
- Steel Plant Raw Material
- Primary Steelmaking
- Secondary Steelmaking
- Ladles
- Practical Steelmaking
- Stainless Steelmaking
- Electric Arc Furnace (EAF) Steelmaking
- Continuous Casting
- General

Supplementary

- Engineering
- Metallurgy
- Environmental Protection
- Management
- Research

Full Services Portfolio

Training Continued

Applications

- Circular Economy
- Digital Technology
- Analytical Techniques

Products

- Finished Goods

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