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Improving the quality of data-driven projects in advanced manufacturing

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The Advanced Manufacturing Research Centre has invested heavily in AI for manufacturing and has seen success in many applications, including process monitoring, knowledge capture and defect detection. Despite the success in individual projects, the AMRC still has few experts in data science and AI and currently has no framework in place to enable wider adoption of AI nor to ensure the quality of AI projects beyond the final technical review. To enable faster adoption of AI, whilst maintaining quality, the Standardised Data-Centric Manufacturing (DCM) Workflow has been developed. A Github platform has been built from which colleagues and industry partners can find documentation templates, codes and guidance on best practice for DCM projects. The platform provides transparency and trustworthiness to decision-making through the DCM process as well as recommended resources and software to ensure the right tool is used for the right problem. The platform enables transparency in the data engineering performed through DCM projects. As important, the platform provides a comprehensive guide to scoping a DCM project and thus avoids the common pitfall of underestimating the resources and time required to collect quality data and carry out data-intensive analysis required when using AI for reliable decision making. Guidance and recommended resources provide a mechanism for engineers to upskill in the relevant areas of data science and AI and will provide the foundation for future upskilling efforts. The platform has been developed by data scientists and will be tested through specific case studies across the AMRC's seven groups, including machining, design, composites and castings. User feedback will be used to improve the platform ensuring that it provides a working standardised workflow for the manufacturing industry with flexibility where required. The platform will provide a mechanism for sharing expertise and data, collaboration and knowledge capture of all DCM projects.

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Talk

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Primary author: LEE, Lindsay (Advanced Manufacturing Research Centre)

Co-authors: Ms SMITH, Erica (Advanced Manufacturing Research Centre); Dr DOMINGUEZ-CABALLERO, Javier (Advanced Manufacturing Research Centre); Dr AYVAR-SOBERANIS, Sabino (Advanced Manufacturing Research Centre); Dr ROOKER, Timothy (Advanced Manufacturing Research Centre)

Presenter: LEE, Lindsay (Advanced Manufacturing Research Centre)

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