Cloud Manufacturing
- Towards Resilient and Scalable High Value Manufacturing

EPSRC Grant EP/K014161/1

S Ratchev, A Popov, R Gomes, D McAuley, N Krasnogor, B Logan, S Sharples, E Kelly, G Terrazas Angulo, E Castro, P Felli, D Golightly
Project Overview

• Vision:
  – **Cloud Manufacturing** – a new platform to enable the provision of resilient, scalable, cost effective and knowledge-intensive distributed manufacturing capabilities, encompassing the whole life cycle of design, production, use, maintenance and recycling

Principal goal:
  – To define, validate and industrially demonstrate the informatics and manufacturing architecture and supporting theoretical models, methods and algorithms

• Key Research Questions:
  – What would be the architecture for the manufacturing cloud?
  – How to develop the required infrastructure and platform services?
  – How manufacturing resources and objects participate in the cloud?
  – What is the scale of the "cloud" and how is it to be built?
  – How is manufacturing data represented, aggregated, shared, stored and processed?
  – How can we capture and analyse digital object footprints?
Current Progress

• Generic architecture, principles and rules for construction and evolution of cloud manufacturing patterns

• Formalisation of the process of dynamic formation and deployment of cloud manufacturing services

• Development of common cloud manufacturing testbeds.
Cloud manufacturing
Experimental testbeds

Local networks of SMEs

- How to join the Cloud
- Manufacturing service deployment
- Applications in the cloud
- Technology Integration
- Manufacturing as a Social Network
- Security, IP, risk

Global Cloud

- Formation of a manufacturing cloud
- Joint capability offering and optimisation
- Data security
- Accessing the Manufacturing Cloud
- Global logistics

Factory Cloud

- Data capture and presentation
- Data aggregation and visualisation
- Data analytics and management
- Digital object footprint analysis

Inter-campus Cloud

Data Cloud

- Cell data
- Cell data
Target Industrial Impact

Delivering manufacturing without boundaries...

- Accelerate Time-to-Market
- Optimize Design and Manufacture
- Gain Instant Access to Manufacturing Solutions
- Integrate Lifecycle support
- Cut Capital Cost and Complexity
- Increase resource utilisation

Manufacturing Cloud