Importance of a Product life-cycle data **access** to facilitate product Recirculation in a Circular Economy

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MODPROD
Center for Model-Based Cyber-Physical Product Development

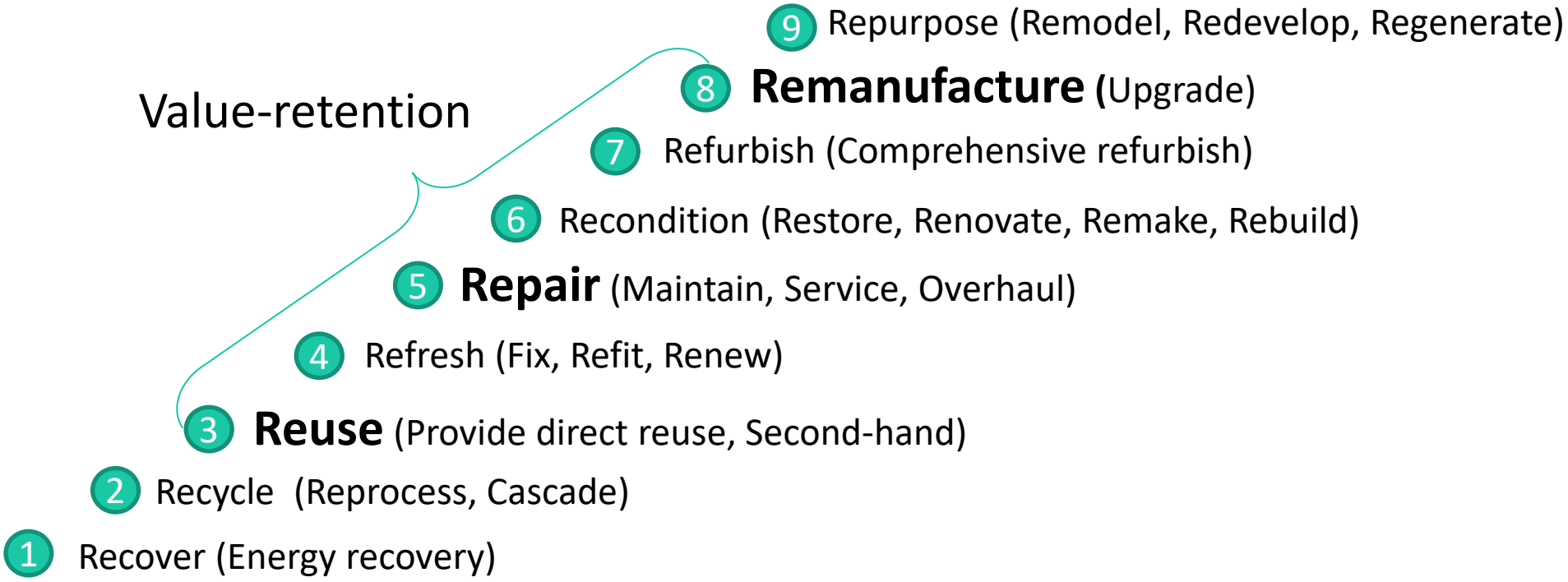
Right to Repair

Is a coalition of 40 organizations in 15 European countries pushing for system change around repair.

- 2019 European Commission developed its Green Deal – for sustainable future
- 2020 **Right to repair** movement in Europe to support product repair
- It is the fight against product obsolescence and a call for a product labeling for repairability
- Making repair a norm and going against big interests and strong industries
- French (EU) repairability index - product suitable for repair index

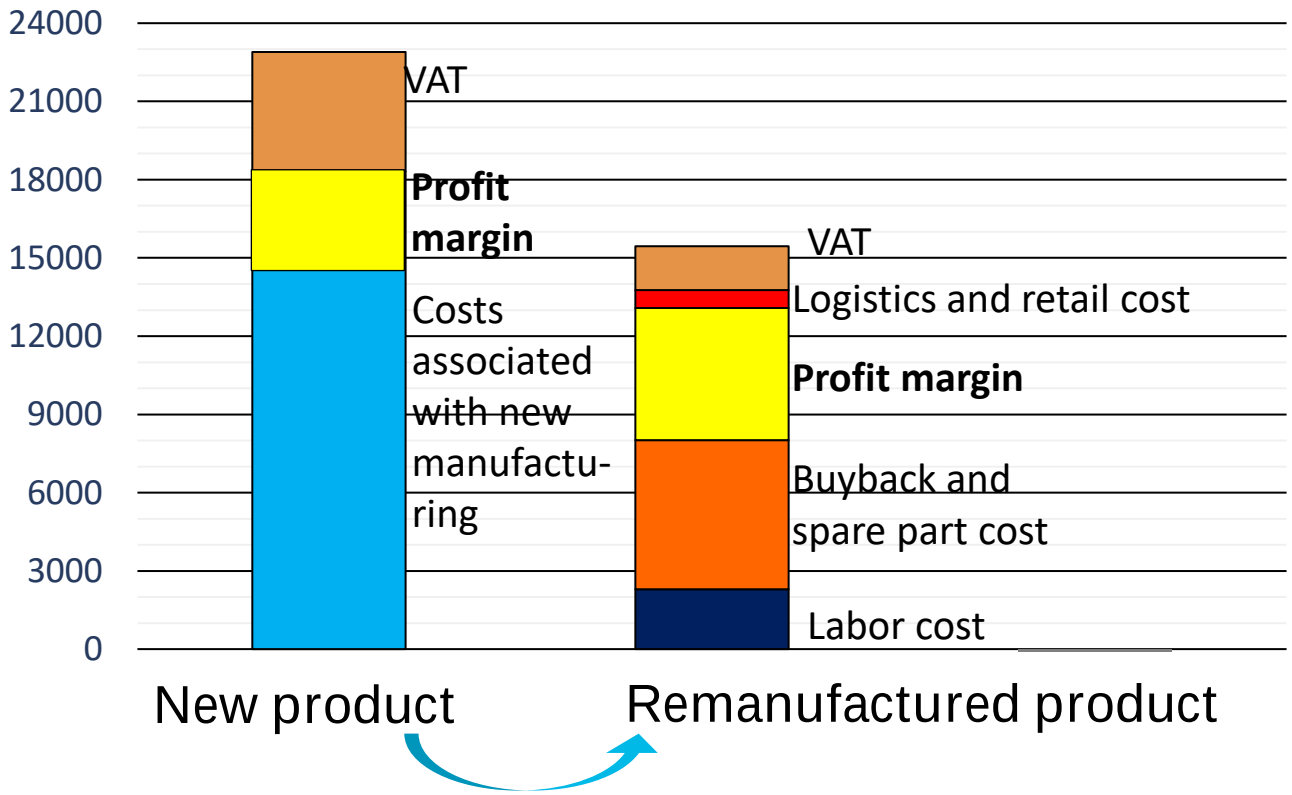
Source (www.repair.eu)

9 Recirculation processes



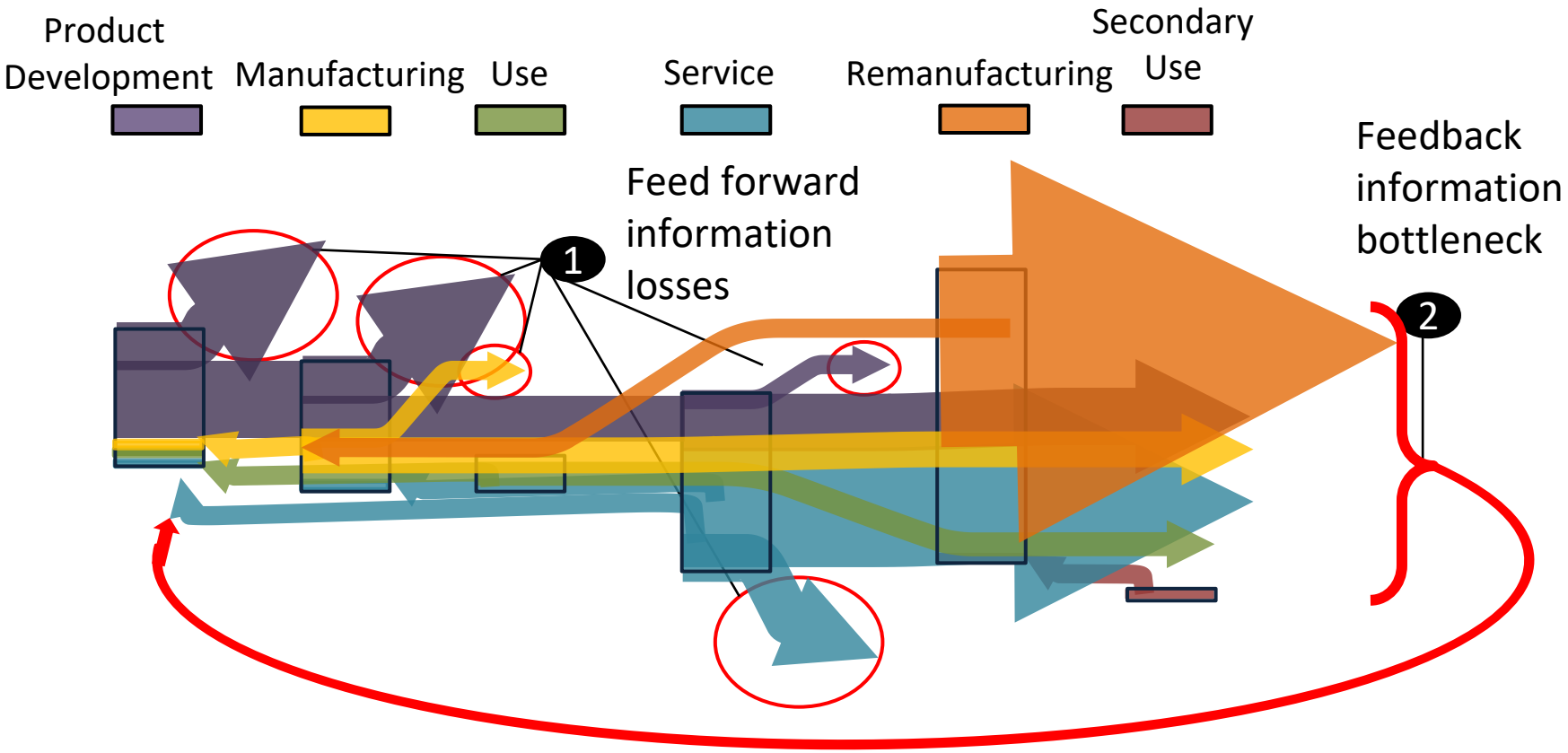
Source (Kurilova-Palisaitiene, J., Sundin. E. ICoR 2021)

Profit margin with remanufactured products



Source (adapted from Vogt Duberg, J. 2019)

Sankey diagram for information flow



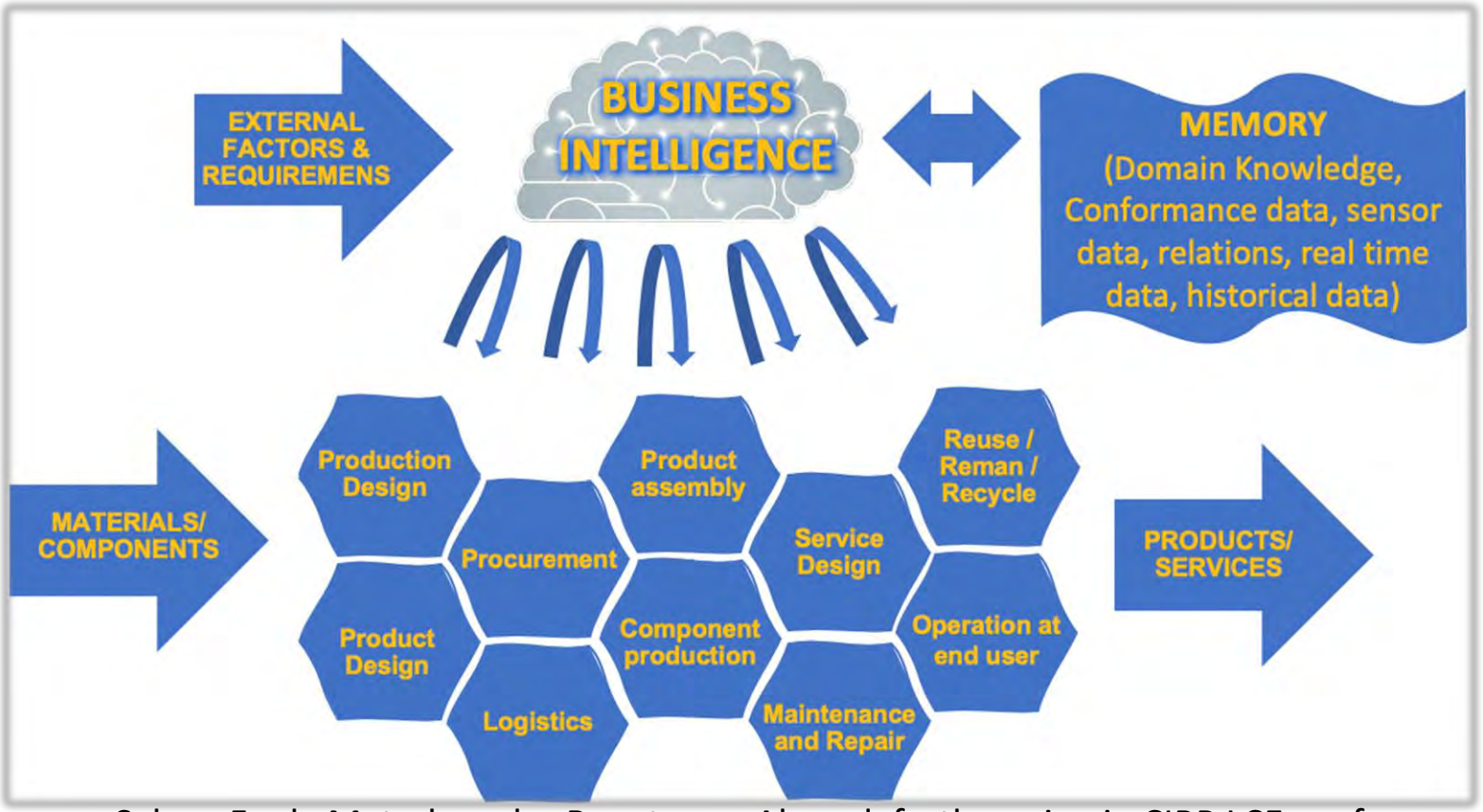
Source (Kurilova-Palisaitiene, J. et. al, 2016)

Digital Product Passport

- The Circular Economy Action Plan contains a section on planned action towards "*Designing sustainable products*".
- As part of this legislative initiative, the Commission will consider establishing sustainability principles and other appropriate ways to regulate, including reducing carbon and environmental footprints and "mobilising the potential of digitalisation of product information, including solutions such as digital passports, tagging and watermarks".
- "Digital technologies can track the journeys of products, components and materials and make the resulting data securely accessible. The European data space for smart circular applications will support applications and services such as product passports, resource mapping and consumer information".

Source (https://ec.europa.eu)

Vision of AI-LCE (Adaptive and intelligent lifecycle engineering)



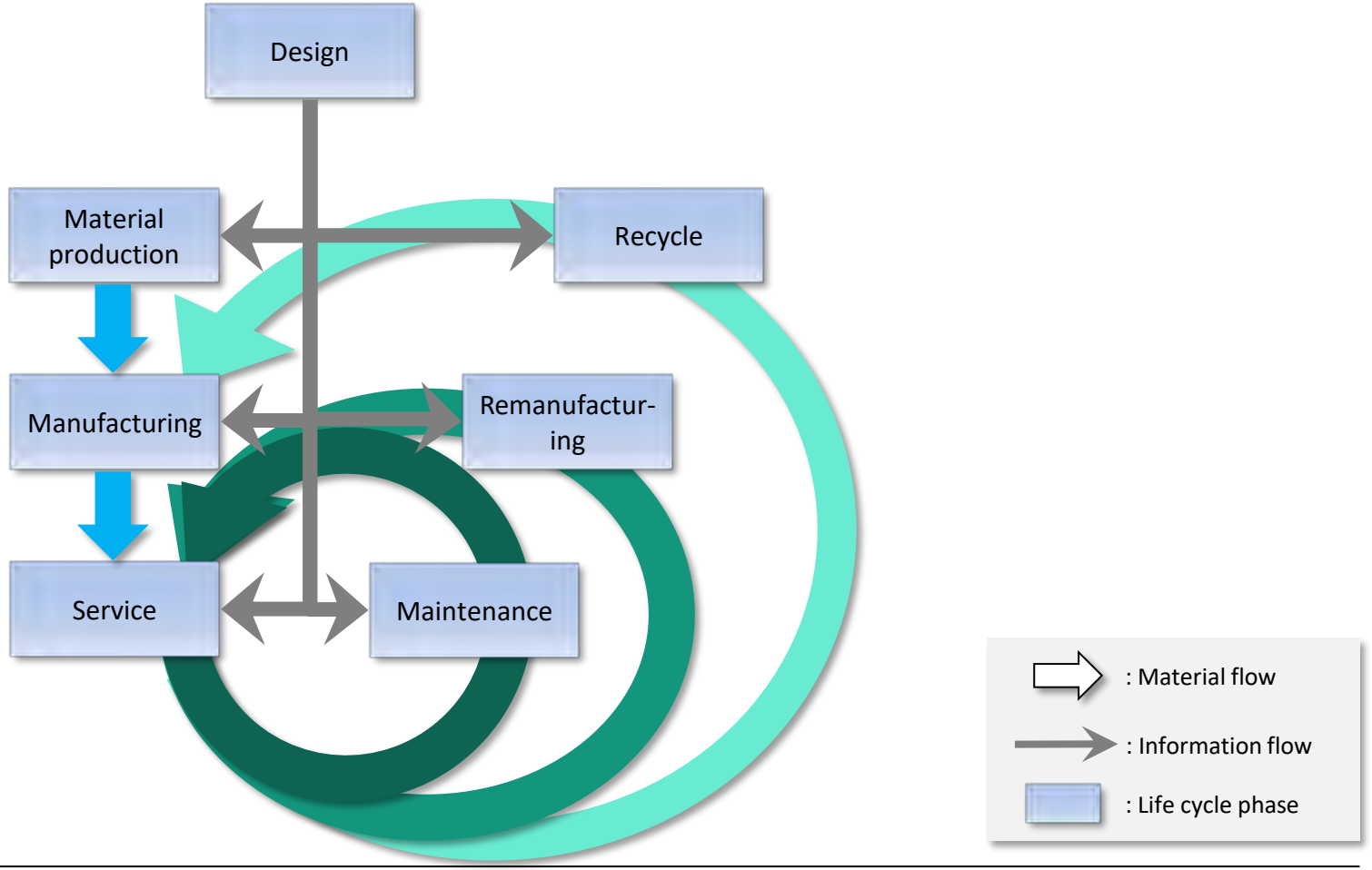
Source: Sakao, Funk, Matschewsky, Bengtsson, Ahmed, forthcoming in CIRP LCE conference, March 2021

Comparison between traditional LCE and AI-LCE

	Traditional LCE	**AI-LCE**
Perspective	Lifecycle perspective	Lifecycle perspective
Digitalization and IoT	Beneficial but not required	A foundation for deployment
Time for changing activities	Typically, longer than a lifecycle	Within a lifecycle (even on real time)
Accuracy of changes made	Low	High
Intelligence used	Mainly human intelligence	Human and artificial intelligence (complementary)
Data storage used	Local databases	Uniform data access (e.g. data lake)

Source: Sakao, Funk, Matschewsky, Bengtsson, Ahmed, forthcoming in CIRP LCE conference, March 2021

Importance of design with the lifecycle perspective



Thank you for attention!

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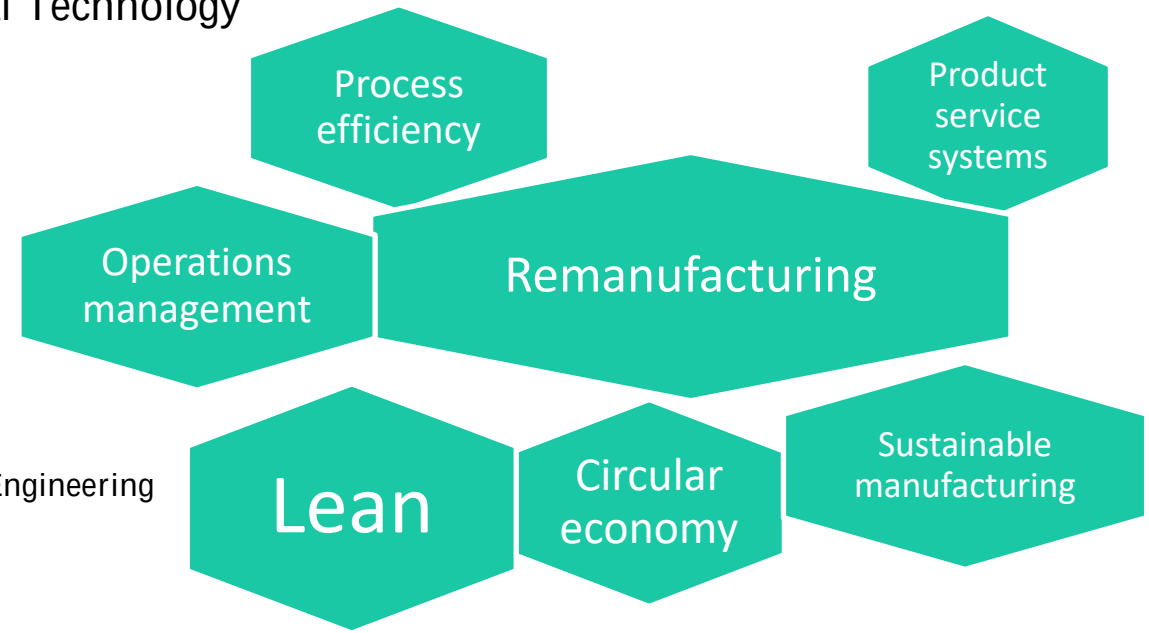

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