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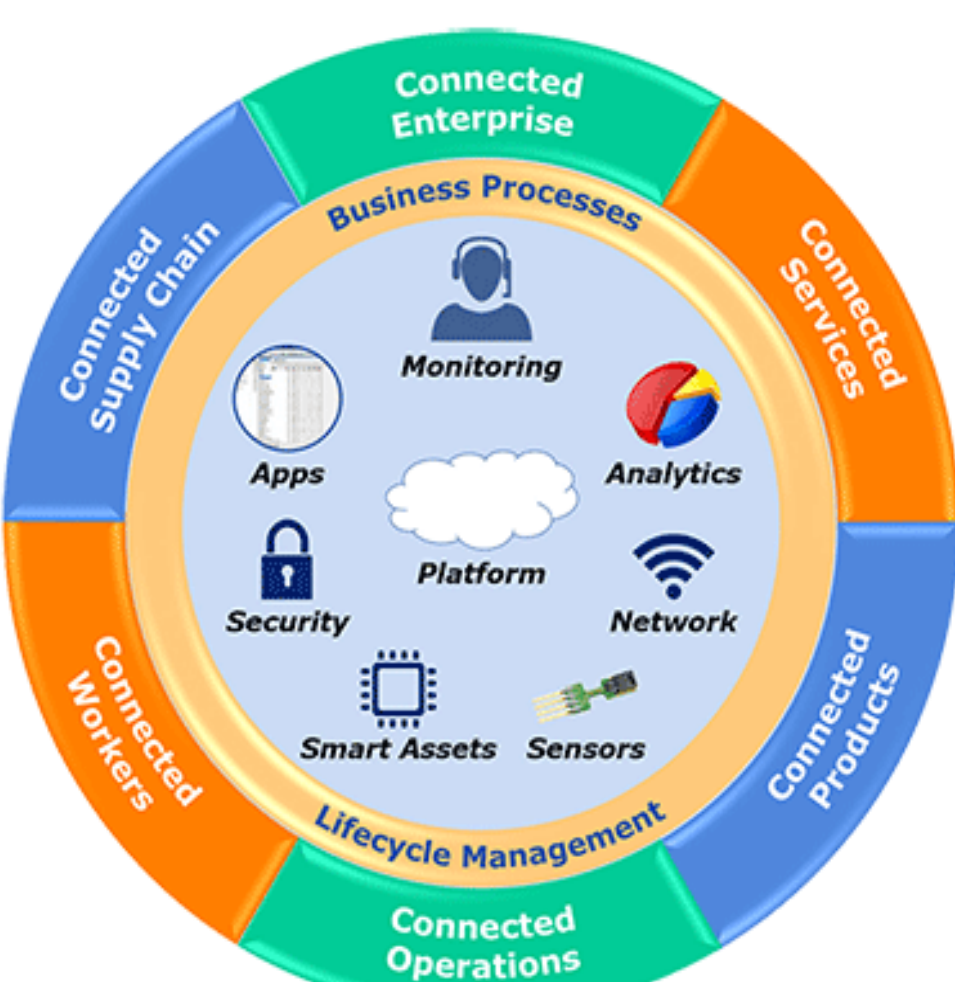
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Digital Advantage Framework for Growth and Competitiveness in Small and Medium Enterprises

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Introduction

Many aspects of daily life have dramatically changed in recent years with the adoption of new technologies, which is reflected in the business world in what is referred to as the fourth industrial revolution (or Industry 4.0). However, not all companies are progressing at the same rate. Larger companies generally possess greater capability in terms of skills and investment, while many smaller organisations lack of skilled manpower, high investments and struggle to handle organisational changes.



Source: ARC Advisory Group, 2020

Seventy-three companies have been surveyed to identify and examine the level of awareness of digitalisation amongst Irish manufacturing SMEs and empirically assess the factors that influence the

intention of such companies to adopt higher levels of digitalisation.

Aim

To examine the level of awareness of digitalisation amongst Irish manufacturing SMEs and empirically assess the factors that influence the intention of such companies to adopt higher levels of digitalisation.

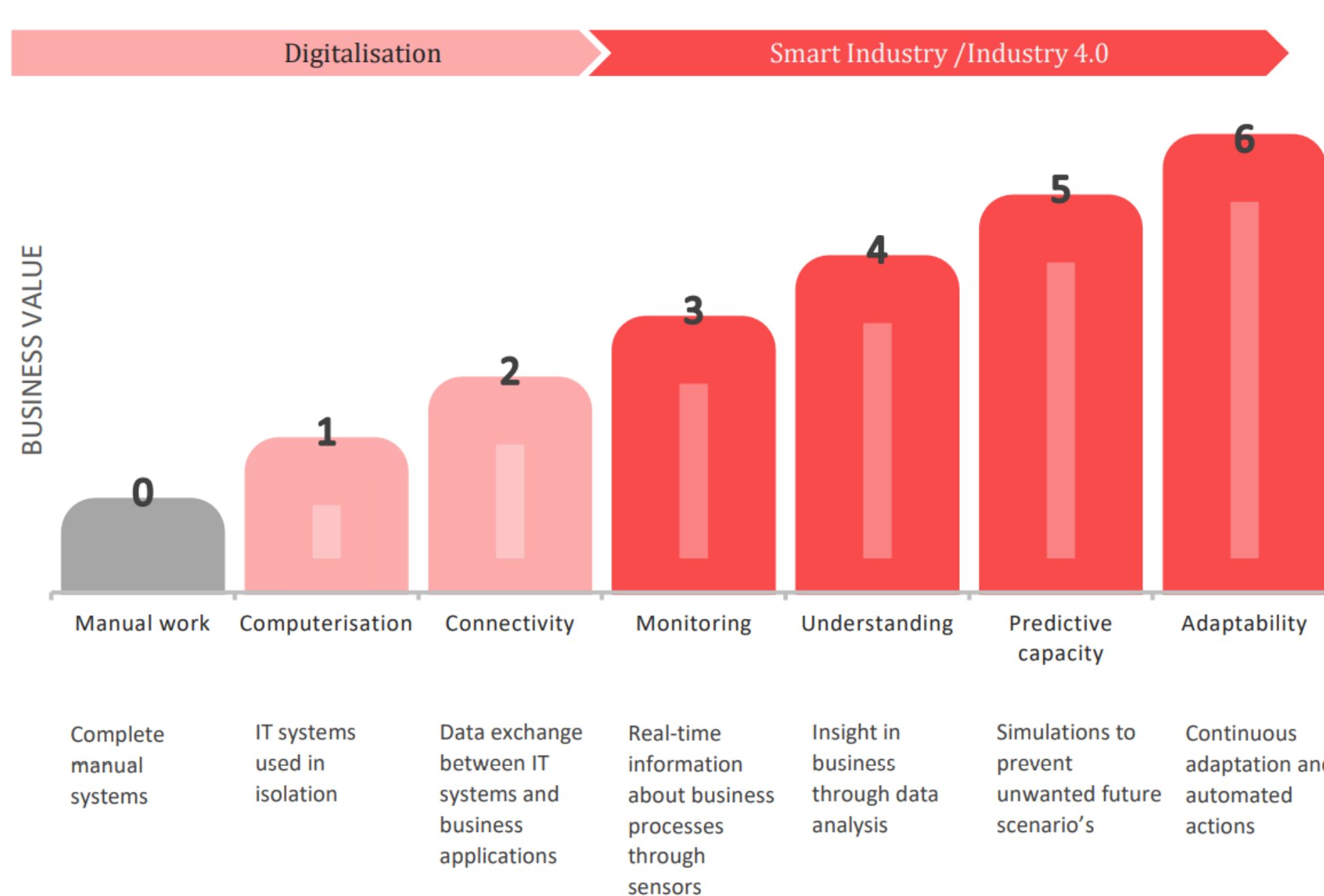


Figure 1: Stages in the Industrie 4.0 development path (source: FIR e. V. at RWTH Aachen University)

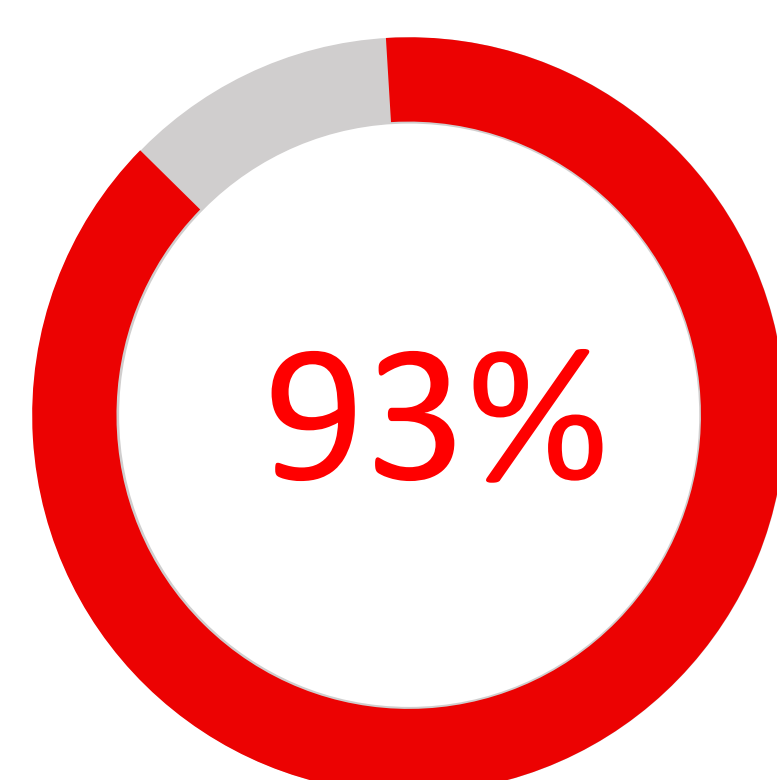
Methods

The present study aims to design the most appropriate technology acceptance model to meet the requirements of SMEs.

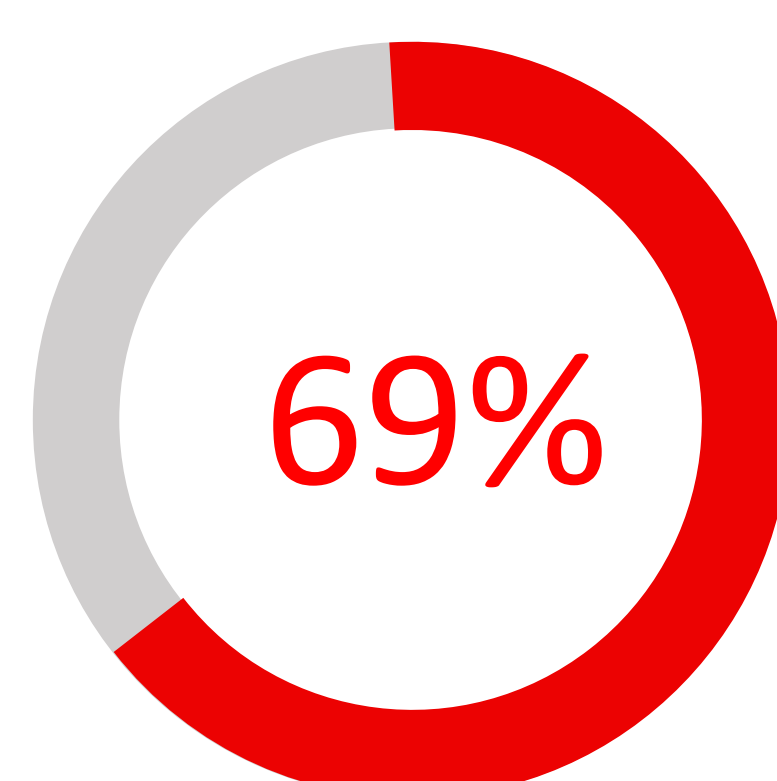
- 1) An adapted model of the unified theory of acceptance and use of technology (UTAUT) will be used in this study addresses the following constructs: facilitating conditions, performance expectancy, effort expectancy and behavioural intention (Venkatesh et al., 2012).
- 2) To facilitate quantitative analysis of the constructs, primary data is being collected via an online survey on the Qualtrics platform.

Primary Results

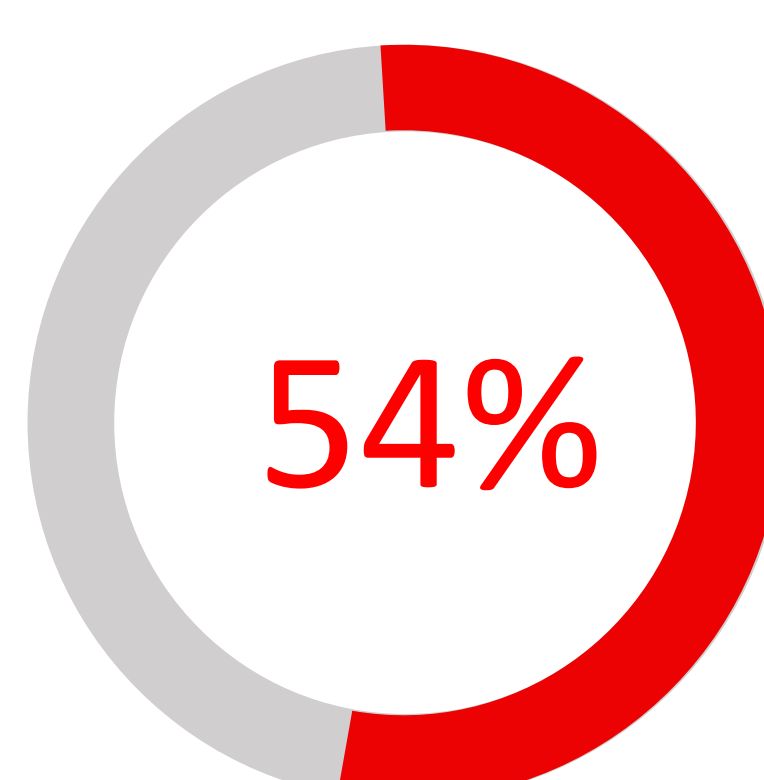
The impact of Covid-19 has accelerated the existing need for smaller companies to adopt digital technologies to ensure the survival of their businesses. The survey results also show that:



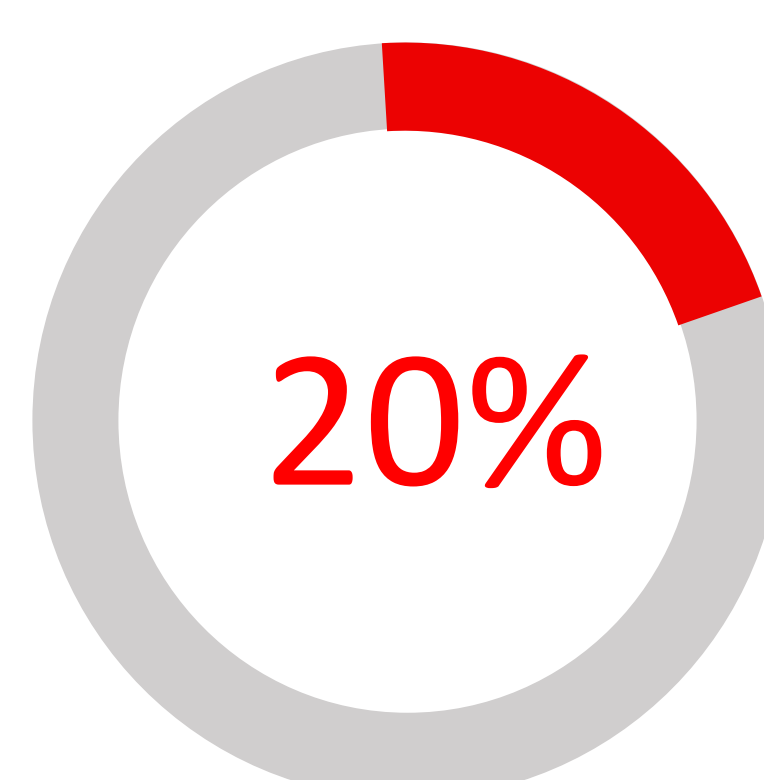
Believe in revenue growth for the next three years



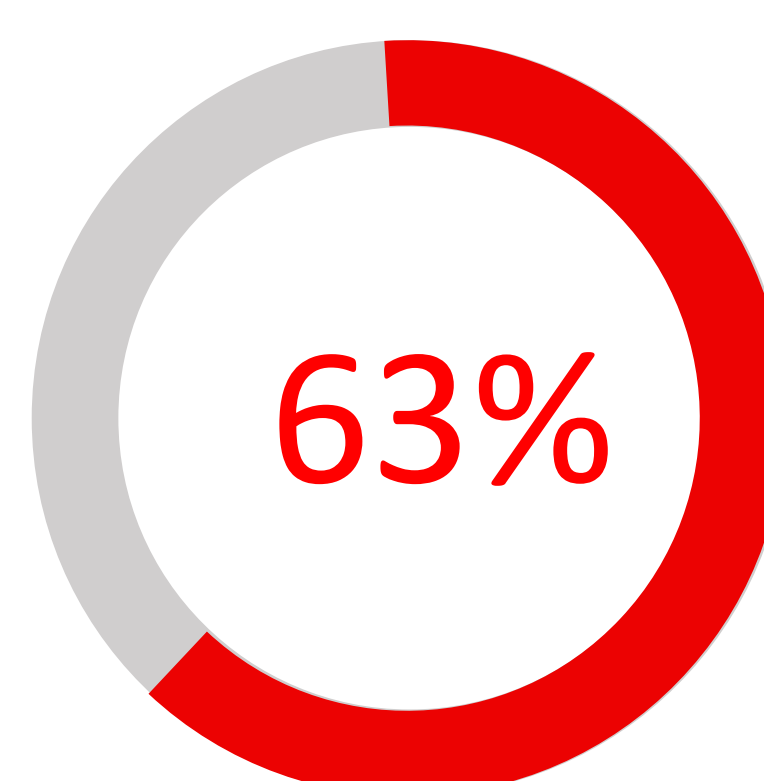
Say that Covid-19 has increased their interest in digitalisation



54.17% of larger companies are at level 4 of digitalisation against 20.45% of smaller organisations



The top three expectations that lead the surveyed organisations willingness to adopt digitalisation are:



Have not used a digital maturity model*

*under the justification that they were not aware of or believed they were not relevant for their companies.

Existing digital maturity models to assess the level of digitalisation in a company have been found to fall short of the needs of small and medium sized businesses.

“Digitalisation... the full deployment of digital technologies to promote change, improve efficiency and add value”

Björkdahl (2020)
Isensee et al., (2020)
Machado et al. (2019)

“SMEs accounted for 99.8% of total number of enterprises in 2016 and over 68% of all persons engaged” in Ireland”

CSO (2016)

Three gaps SMEs have regarding digital transformation:
Gap 1: Lack of infrastructure and mind-set;
Gap 2: An ideal maturity model capable to provide self-evaluation;
Gap 3: After the assessment, SMEs need support on how to proceed with the next steps.

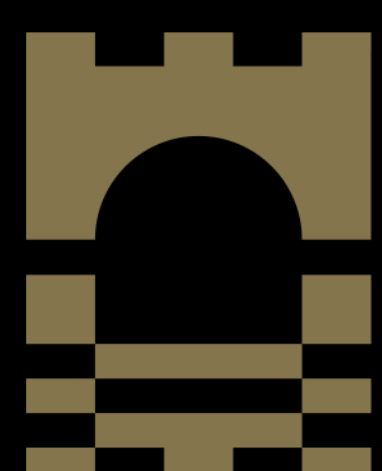
Mittal et al. (2018)

Next Steps

- Complete the survey analysis using the unified theory of acceptance and use of technology (UTAUT);
- Publish the second conference paper at EDSI – May 2022;
- Case study identification;
- Verification with case study companies;
- Validation with test companies.

References

- Anderson, C. and William, E. (2018) *Digital Maturity Model*. Available at: <https://www2.deloitte.com/content/dam/Deloitte/global/Documents/Technology-Media-Telecommunications/deloitte-digital-maturity-model.pdf>.
- CSO (2016) Business in Ireland 2016 – Small and Medium Enterprises'. Available at: <https://www.cso.ie/en/releasesandpublications/ep/p-bii/businessinireland2016/smallandmediumenterprises/>
- European Investment Bank (2019) The digitalisation of small and medium enterprises in Ireland: Models for financing digital projects.
- Schuh G, Anderl R, Gausemeier J, Hompel M, Wahlster W. Industrie4.0maturity index. Retrieved June 2020 from 2017http://www.acatech.de/fileadmin/user_upload/Baumstruktur_nach_Website/Acatech/root/de/Publikationen/Projektberichte/acatech_STUDIE_Maturity_Index_eng_WEB.pdf.
- Gill, M. & Vanboskirk, S. (2016) The Digital Maturity Model 4.0, Forrester. Available at: <https://forrester.nitro-digital.com/pdf/Forrester-s-Digital-Maturity-Model-4.0.pdf>.
- Mittal, S. et al. (2018) 'A critical review of smart manufacturing & Industry 4.0 maturity models: Implications for small and medium-sized enterprises (SMEs)', Journal of Manufacturing Systems. Elsevier, 49(October), pp. 194–214. doi: 10.1016/j.jmsy.2018.10.005.



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