The Digital Transformation Gap Widens Between OEMs and SMMs

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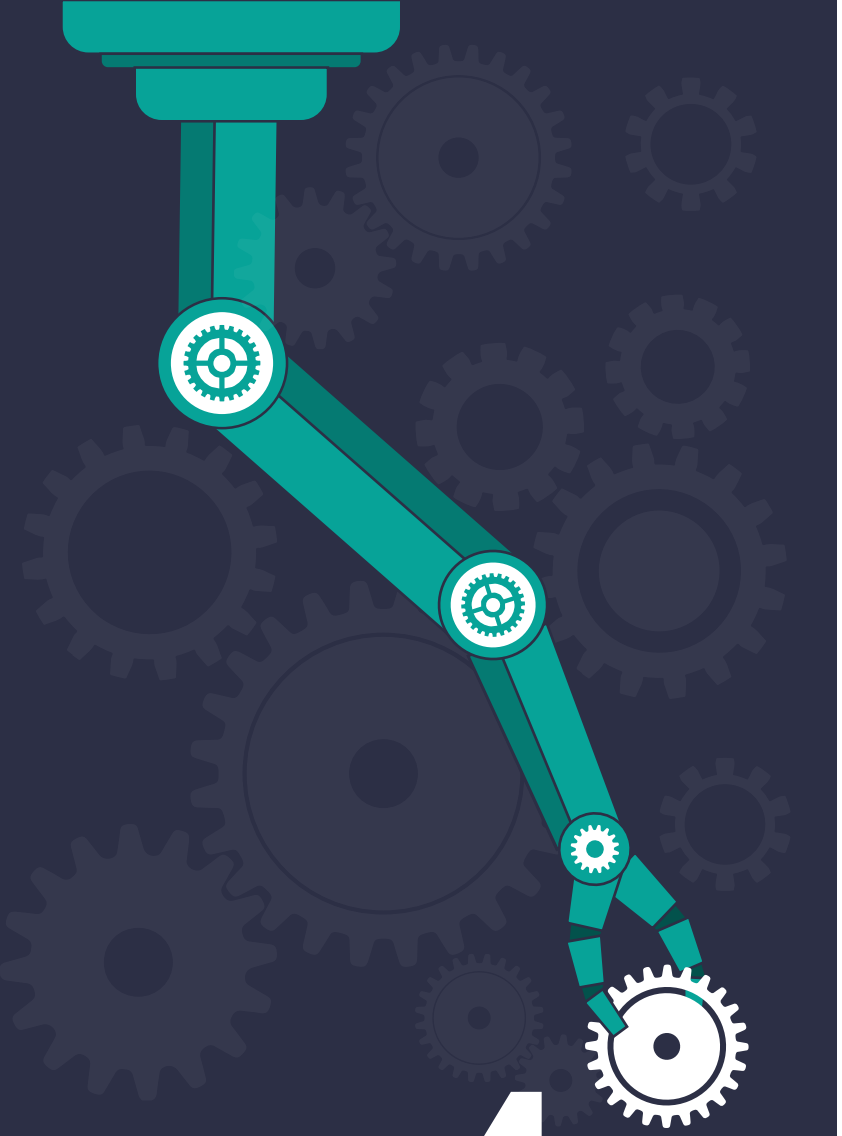
lucrum the group

NIST National Institute of Standards and Technology U.S. Department of Commerce

MBD 360

ROLLS ROYCE

ITI International TechneGroup



4.
INDUSTRY

MxD Key Interview Findings[1,2]

01 Little understanding of “Digital Manufacturing”

Many interview respondents believed “Digital Manufacturing” to simply mean going “paperless” or digitizing data and information.

02 Challenges in technical data exchange

Inefficient communication of information and data occurs from drawings and models that are inconsistent and often require translation.

03 Little supplier-customer design collaboration

Most interviewed suppliers are doing some type of translation from one format to another, and these translations are often not validated.

04 Limited exchange of production data

Only a few of the interviewed suppliers share production data, and those that do are typically in response to an order status request.

[1]Harris, et al., 2019. [2]Harris, et al., 2019.

What is a SMM?

<500 employees

<$100 million in annual sales

“SMMs make up about 90% of manufacturing establishments and use about 50% of the energy consumed by industry.”-ACEEE

ACEEE, 2014.

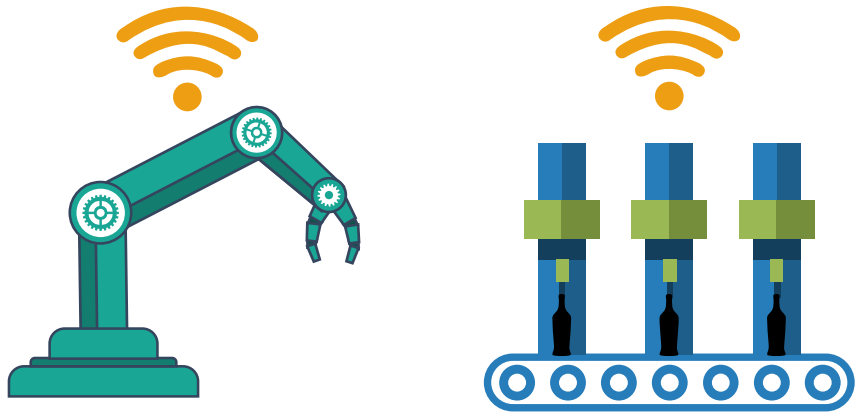
THE PROBLEM

SMMs are lagging in digital transformation

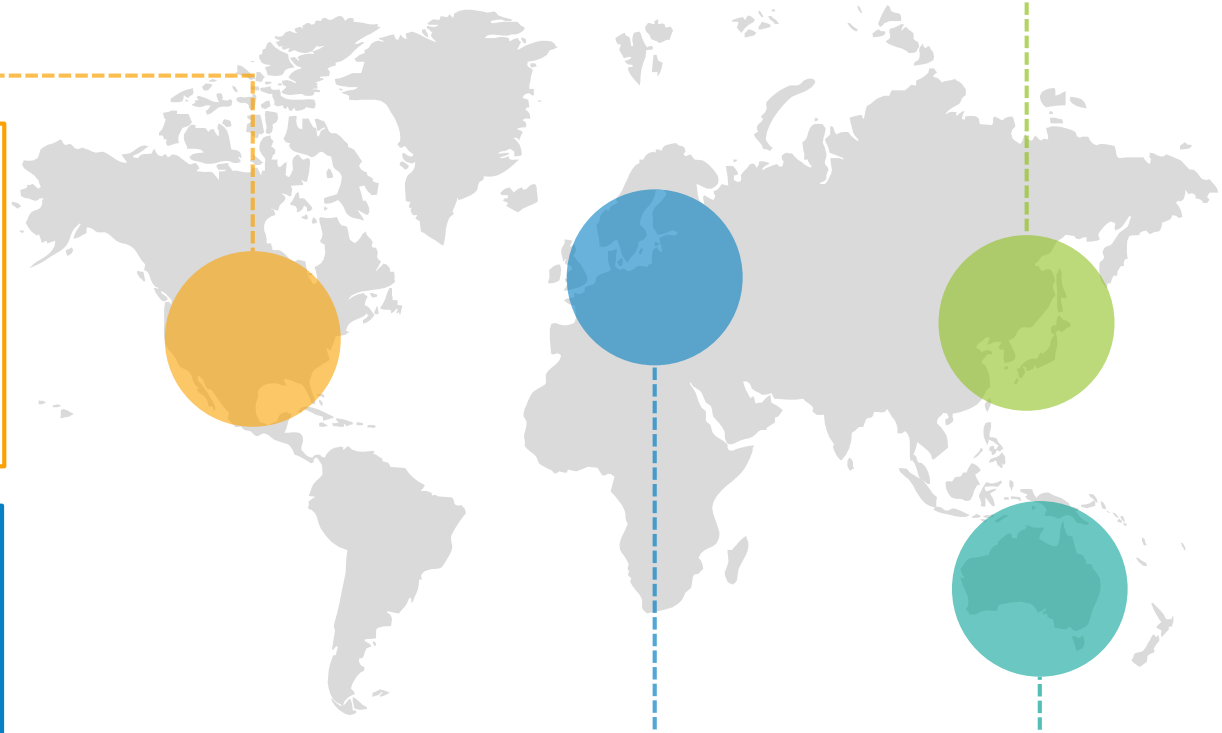
Most effort has been from OEMs

Some say we are already in Industry 4.0

ARE WE THE ONLY ONES EXPERIENCING THESE ISSUES…?



SMMs Lag Worldwide



United States[1,2,3]
SMMs demonstrate little understanding and awareness of digitalization.

Europe[4]
SMMs recognize the need for digitalization but do not know how or where to start.

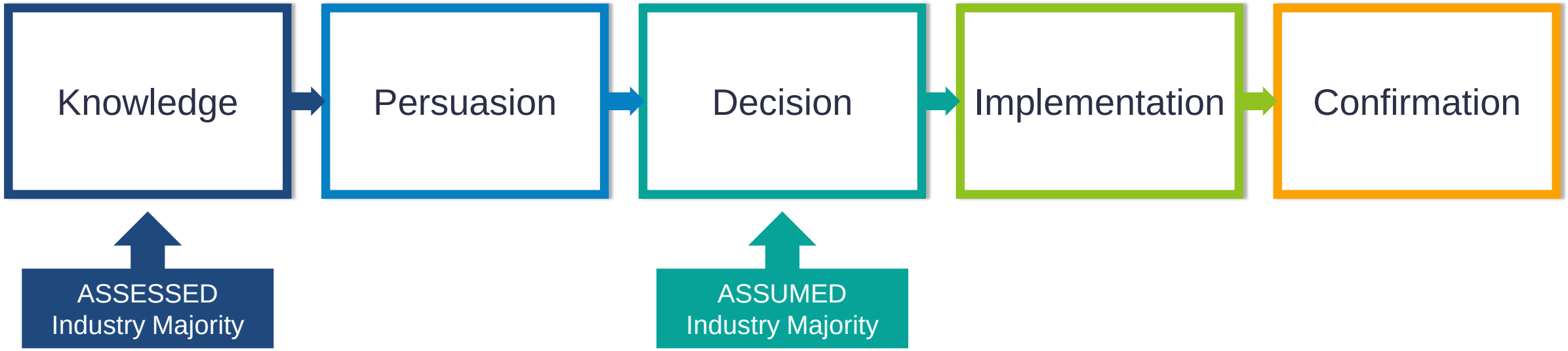
South Korea[5]
SMMs are not up-to-date with the latest digital technologies.

Japan[6]
SMMs face adoption challenges that lead to late adoption of Industry 4.0 capabilities.

Australia[7]
SMMs are hesitant to invest money in the adoption of digital capabilities.

[1]University of Illinois, 2018. [2]North Carolina State University, 2018. [3]Wuest, et al., 2018.
[4]Mittal, et al., 2018. [5]Ezell et al., 2018. [6]Prause, 2019. [7]Schroeter, 2019.

ADOPTION STAGES



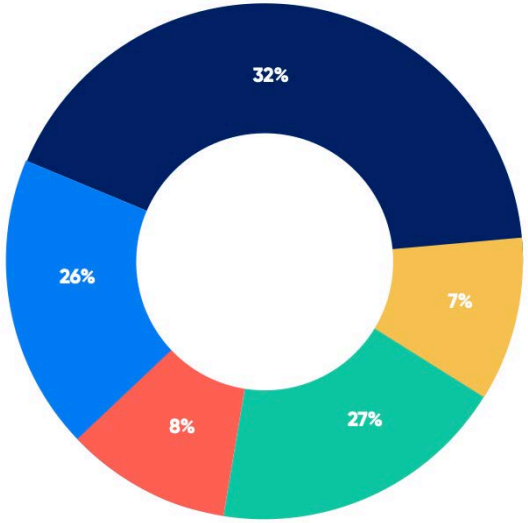
At the onset of the MxD project,
it was assumed that Industry is in the Decision Stage,
but an assessment revealed Industry is still in the Knowledge Stage.

Rogers, 2003.

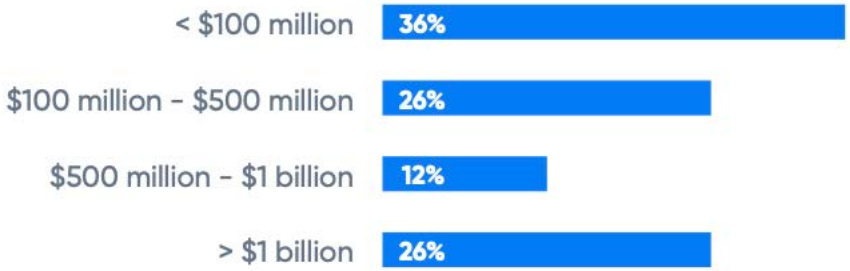
Adoption Stages

2019 ToolsGroup White Paper

- Exploring
- Evaluating
- Gaining Organizational Support
- Executing
- Reaping Benefits



Revenue of Respondents
~200 Respondents



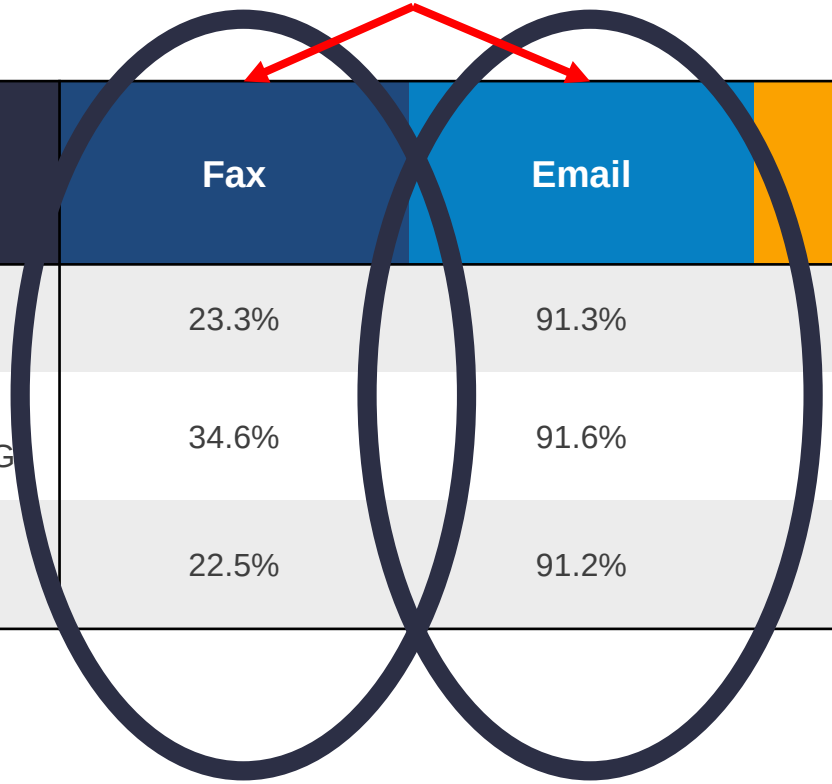
These findings are similar to the MxD project findings
with 58% of respondents being in the Exploring or Evaluating Stages.

ToolsGroup, 2019.

IL and NC Defense Surveys[1,2]

UNSTRUCTURED DATA

Data Exchange Method	Fax	Email	EDI	Portal	# of Respondents
DESIGN/SPECS	23.3%	91.3%	20.4%	29.1%	103
ORDER ENTRY/ACCOUNTING	34.6%	91.6%	32.7%	30.8%	107
ORDER STATUS LOGISTICS	22.5%	91.2%	23.5%	30.4%	102



~23% are still using fax for data exchange

~91% are still using email for data exchange

[1]University of Illinois, 2018. [2]North Carolina State University, 2018.

Adoption Barriers

2018 Infor White Paper

Worry 1

Digital technologies are disruptive, leading to chaos and confusion.

Worry 2

Digital technologies are only for large enterprise-size companies with huge budgets.

Worry 3

Digitalization is all about machines, robotics, and the IoT.

Worry 4

Digitalization is unproven, highly risky, and invites security breaches.

Worry 5

If we don't have a digital plan already, then it's already too late.

Infor, 2018.

Adoption Barriers

2018 Plataine/SMM Survey

44% - Lack of Understanding

29% - Lack of Resources

21% - Lack of Understanding

18% - Lack of Business Case

13% - Lack of Resources

9% - Lack of Standardization/Foundation

9% - Lack of Knowledge

8% - Lack of Business Case

8% - Lack of Knowledge and Trust

* The total responses add up to more than 100% as some respondents marked multiple options.

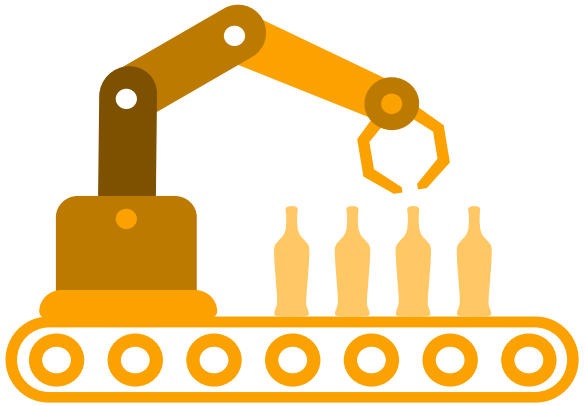
Plataine, 2018.

Misleading State of Industry

2019 Capgemini Research Institute: Smart factories @ scale

Organizations are showing an increasing appetite and aptitude for smart factories:

- Compared to two years ago, more organizations are progressing with their smart factory initiatives today and one-third of factories have already been transformed into smart facilities.



Capgemini, 2019.

Misleading State of Industry

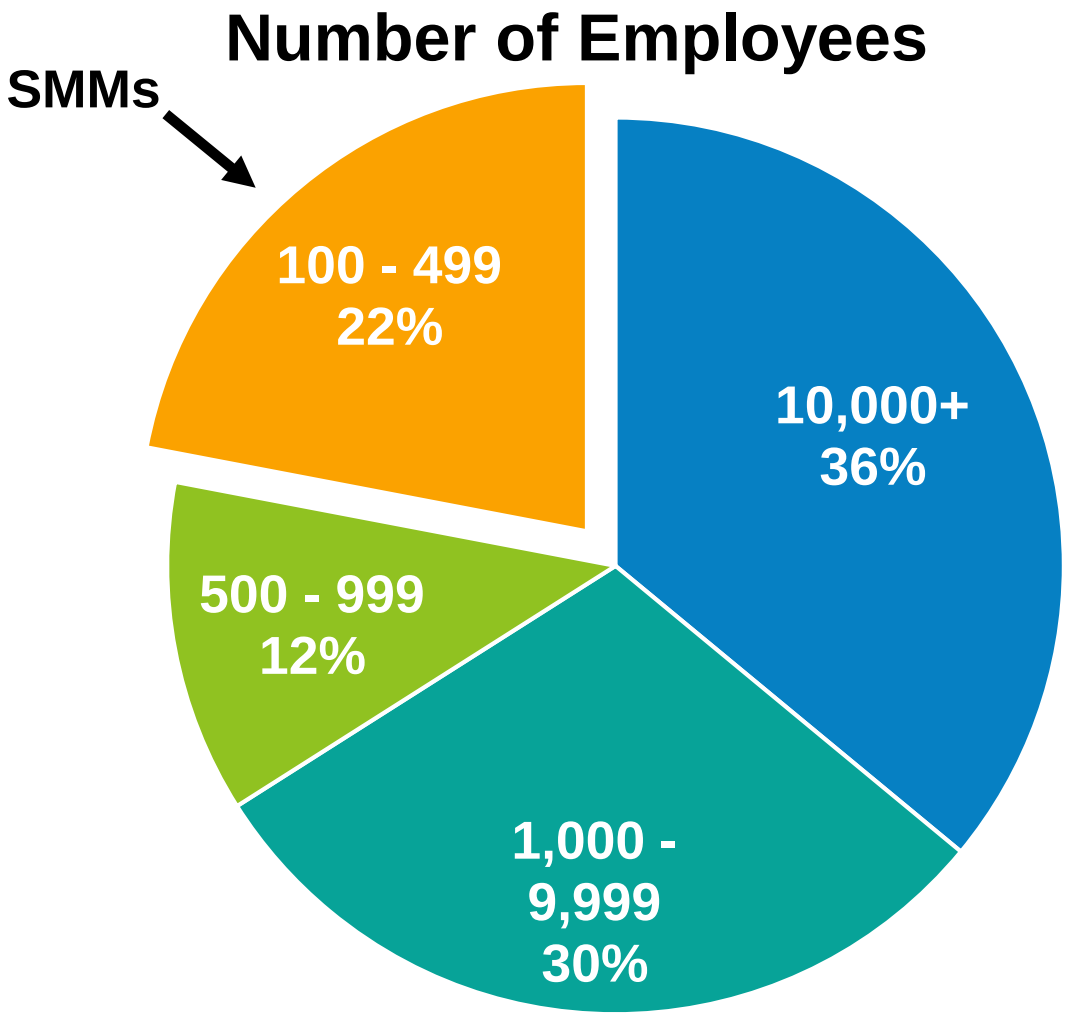
"57% of survey results suggest that the majority of respondents are still in the very early stages."

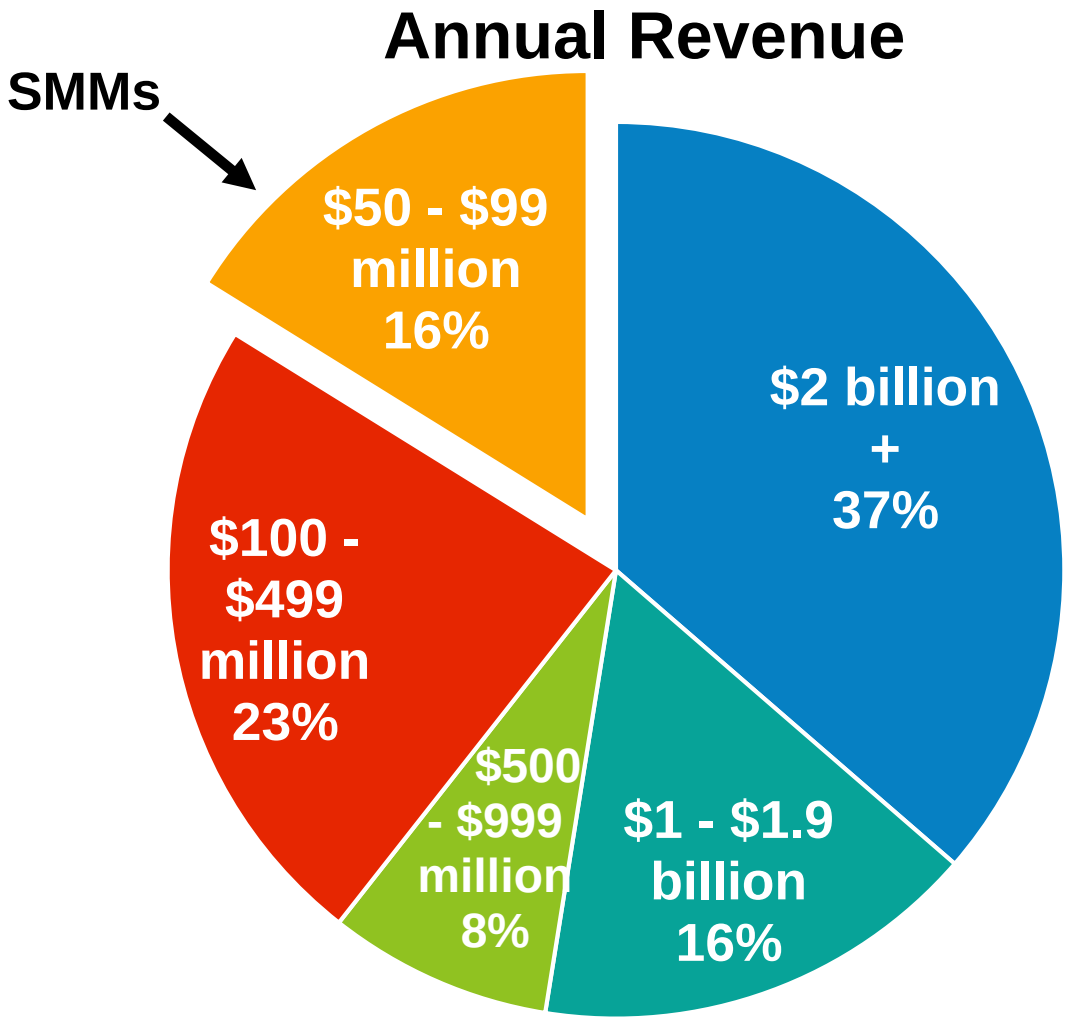
"67% of companies do not have a strategic integration roadmap in place."

IndustryWeek, 2019.

Surveys Favor OEMs over SMMs

2019 IndustryWeek Report cont.





IndustryWeek, 2019.

Interested in Reading More?

ELSEVIER

Manufacturing Letters

Volume 22, October 2019, Pages 16-18

Manufacturing Readiness for Digital Manufacturing

Gregory Harris [a], Ashley Yarbrough [a], Daniel Abernathy [a], Chris Peters [b]

Proc. of the 10th Model-Based Enterprise Summit (MBE 2019), Gaithersburg, Maryland, USA, April 2-4, 2019

Industry Readiness for Digital Manufacturing May Not Be as We Thought

Preliminary Findings of MxD* Project 17-01-01

***(formerly the Digital Manufacturing and Design Innovation Institute of UI LABS)**

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OTHER NATIONAL INITIATIVES

SOUTH KOREA[1]: Creative Economy Initiative

Launched **19 demonstration factories** to promote digital innovation

Goal: 30,000 manufacturers at level one or two and 7,500 at level three by 2022

CHINA[2]: Made in China 2025 Program

10yr plan to accelerate adoption of digital technologies

Direct subsidies (some subsidies estimated to be in **excess of hundreds of billions of dollars**)

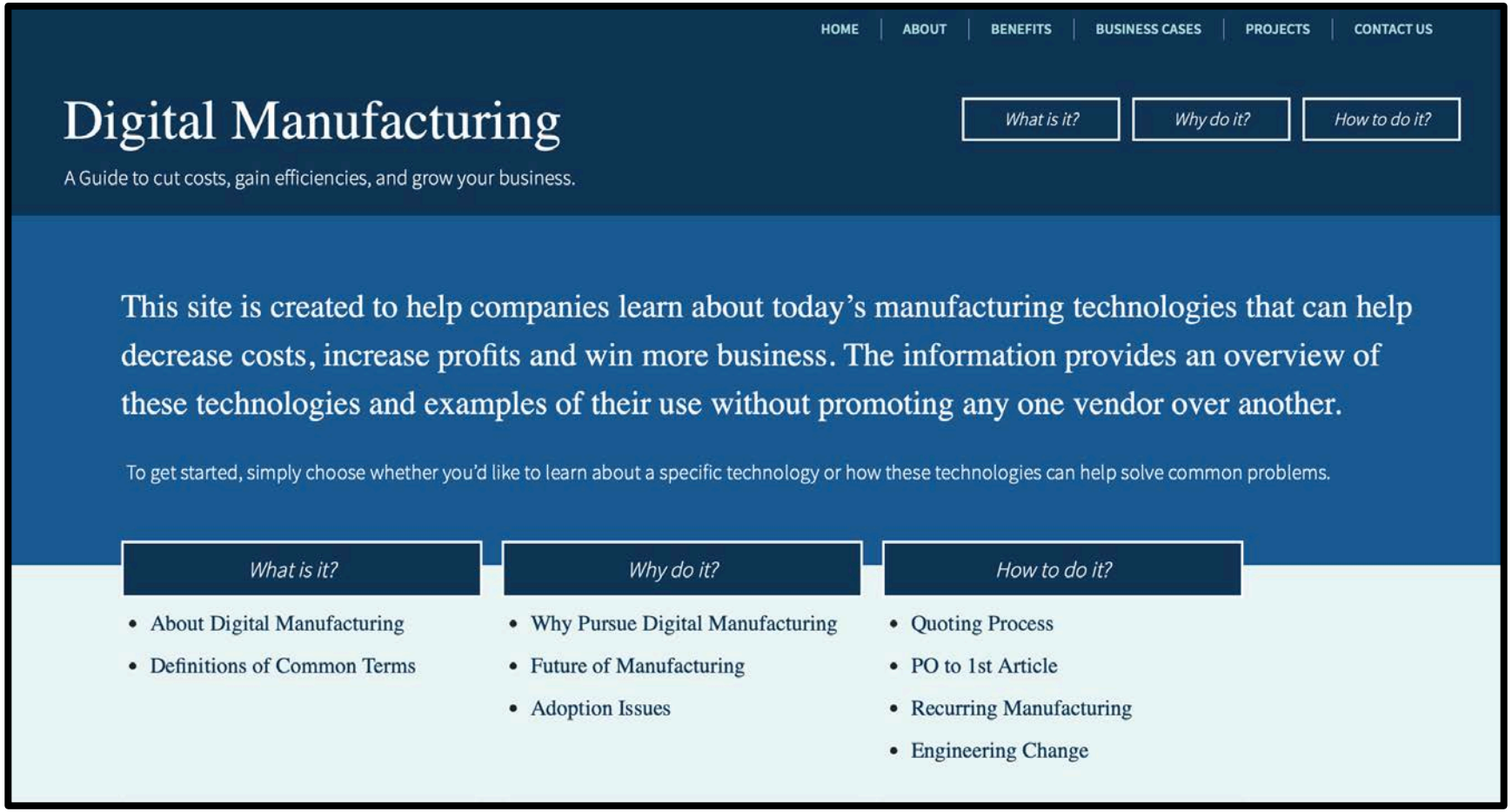
UNITED KINGDOM[3]: National Adoption Programme

Manufacturing Made Smarter Challenge- a **£30 million competition** to boost UK manufacturing productivity and agility

Goal of accelerating adoption by SMMs

[1]Peters, 2019. [2]McBride & Chatzky, 2019. [3]GOV.UK, 2019.

Digital Manufacturing Guide



CONCLUSIONS

Digital transformation gap is widening between OEMs and SMMs

OEMs should support their SMMs in digitalization efforts

Need government involvement to assist SMMs in digital transformations

Need further study on state of U.S. industrial base

Need national manufacturing policy or initiative like other countries

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Thank You!

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