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Experience 3D

FACTORY OF THE FUTURE

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PLM GROUP


Reykyavik
Oslo
Stockholm
Helsinki
Tallinn
Riga
Copenhagen
Vilnius
200
8
17
SOLIDWORKS
3D SYSTEMS
Markforged
3DXpert™
materialise
innovators you can count on
Geomagic®
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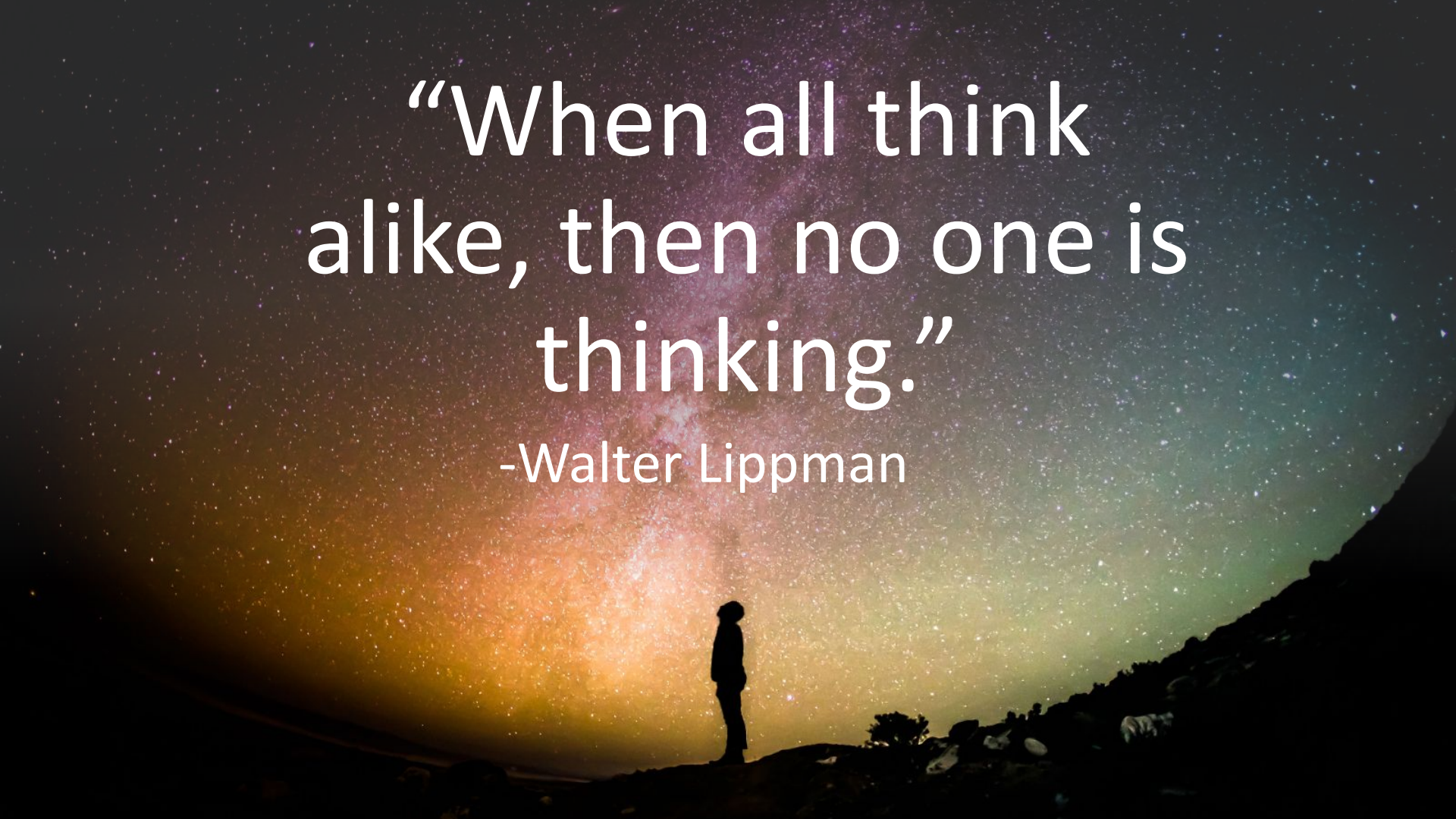
“When all think alike, then no one is thinking.”
-Walter Lippman

Disruptive technologies are not always obvious

Technology's history is littered wrong predictions, often made by very smart, successful - and wealthy - executives

"There's no chance that the iPhone is going to get any significant market share."

- Steve Ballmer, Microsoft CEO, 2007

1876: Telephone flaws: William Orton, President of Western Union

1878: End of electric light: Erasmus Wilson, Oxford Professor

1903: Horses will outlast cars: Horace Rackham, bank advisor warning Henry Ford

1916: Film not as compelling as stage: Charlie Chaplin, actor, producer, director

1921: Radio has no value: Associates of David Sarnoff, radio investor

1959: Limited potential of copy machines: IBM told Xerox founders

1981: Cellphones won't replace wire phones: Marty Cooper, inventor

1992: Smart phones are a pipe dream: Andy Grove, former Intel CEO

3D Printing: Catalyst for the 4th Industrial Revolution

Digital industrial revolution


Artificial Intelligence


Industrial Internet of Things


Big Data and Analytics


Robotics


3D Printing

Transforming $12T manufacturing market


Rapid innovation


Shorter time to market


Less inventory


More efficient supply chains


Higher capital efficiency

SUSTAINABILITY

Per HP internal estimates

ADVANTAGES WITH AM

Why 3D?

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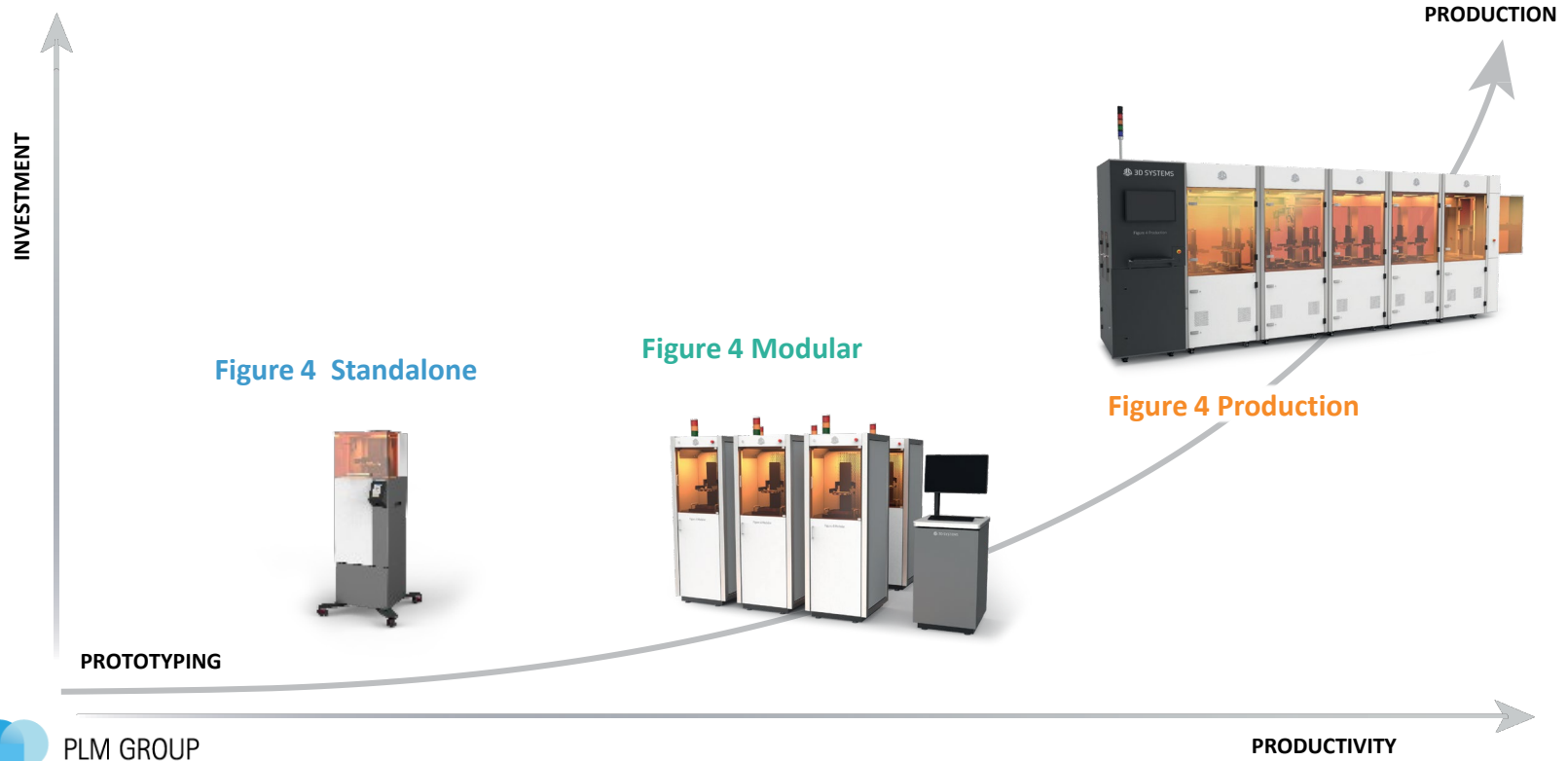
3D PRINTING FACTORY



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AM FACTORY

25 fuel nozzles printed in a single print run on the DMP Factory 500.

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AM FACTORY

PRODUCTION CUSTOMERS ARE SCALING

48%

of installed base are multi-unit deployments

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3D printed windows.

-Worlds first window inn biocomposite

GE AVIATION

WÄRTSILÄ

3D printed lift equipment.

-First certified 3D printed lift equipment in the world.

100,000
EUROS SAVED WITHIN 8 MONTHS

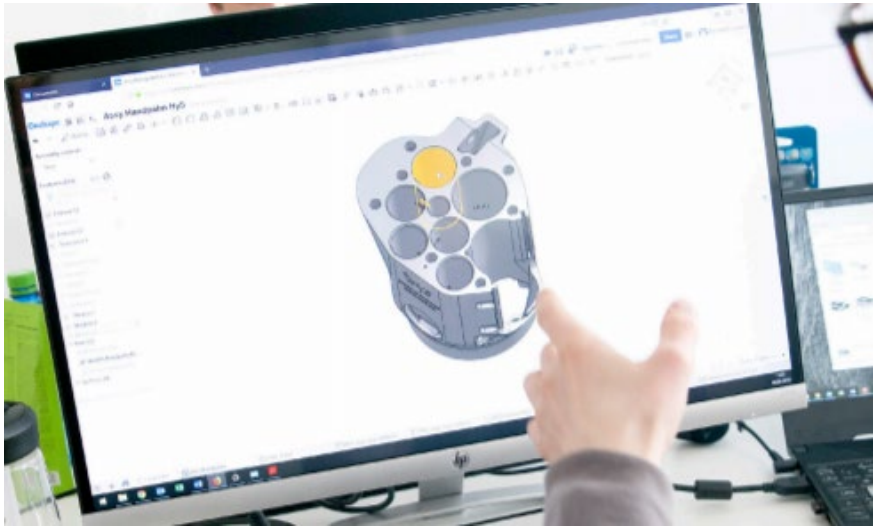
75%
WEIGHT SAVINGS

960kg
TESTED LIFTING CAPACITY

HY5

Point

- 3D printed prosthesis hand
- First generation in plastic
- Second generation in Titanium
- Only possible with 3D print technology



MATURITY LEVEL

Maturity level	Strategic direction	Organization and processes	Technology enablement	Value and performance management
4 Strategic application across company	▸ Application of 3DP embedded in company's strategy ▸ C-level sponsorship	▸ 3DP embedded in relevant operational areas with clear organization and process	▸ Own or joint ventures 3DP production locations ▸ Own or joint 3DP research centers	▸ Embedded measurement of how applying 3DP improves efficiency
3 Application in "champion" departments	▸ Clear direction on application of 3DP in a certain area	▸ "Champion" departments have integrated 3DP into operations ▸ First cross-functional teams	▸ Own systems from relevant technology ▸ Established collaborations	▸ Measurable results within specific departments or areas of application
2 Experimenting and testing	▸ Department leaders start to invest, test and understand the technology	▸ Teams of enthusiasts test 3DP technology ▸ No structured processes for application of 3DP	▸ Testing different technologies with service providers, research group or own cheap systems	▸ First own use cases with measurable results
1 No experience	▸ Leadership has no or low awareness about 3DP and application in the company	▸ Eventually, first evaluation and consideration of possible	▸ Eventually first considerations of form of application (own system, cooperation)	▸ No own experience. Eventually, review of experience from other companies

Source: EY

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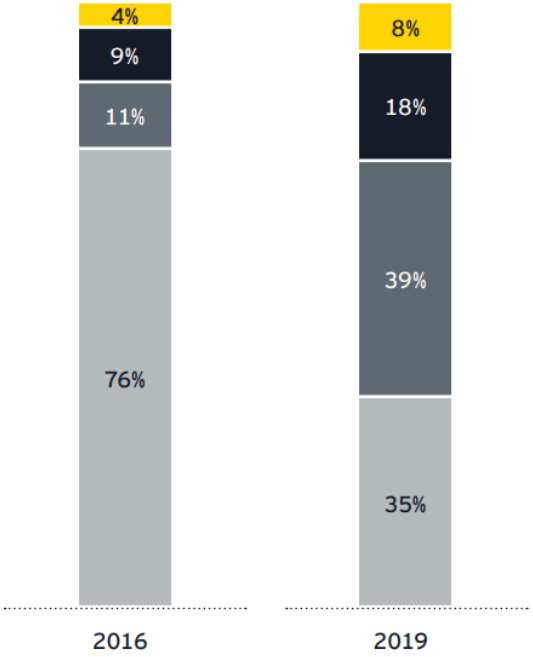
MATURITY LEVEL CHANGES

Maturity levels of the surveyed companies (%)*



*n=900 companies, EY global 3DP survey, April 2016 and April 2019

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Thank you!

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