


3D
STRATEGIES

THE IMPACT OF 3D PRINTING ON SUPPLY CHAINS

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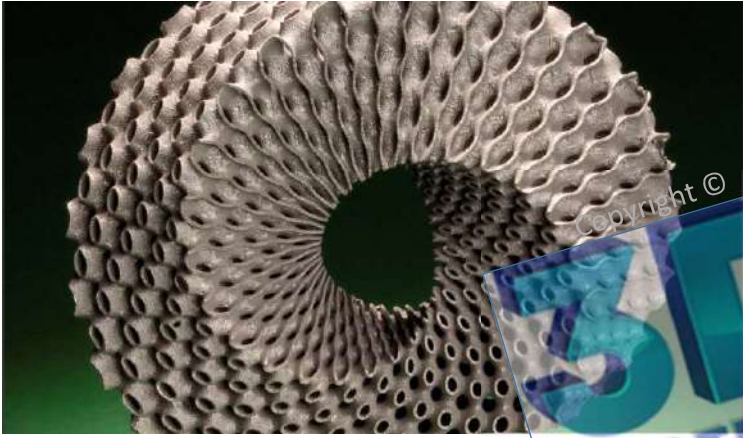
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HOW FAST IS THIS TECHNOLOGY MOVING?

- Exists since 1983
- 2000s: Technology used expanded from Rapid Prototyping to manufacturing
- 2010+: Dental Industry totally adopted 3DP. NASA uses AM in space.
- 2015: Thoughts of printing houses and bridges
- 2017: First concrete 3D printed bridge in use
- 2018: First 3D printed steel bridge completed
- 2020: First 3D printed houses rented out; 4D printing of smart materials

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How 3DP Impacts Manufacturing

- Less capital investment required
- Localization of production
- Simplified supply chains
- Supports Lean and Agile
- Design improvements (lighter, stronger, less assembly)
- Enables complex geometries
- Mass customization and individualization
- Benefits of scale no longer apply
- Subcontractors for other producers' low-volume items
- Consumers become Prosumers

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The effects on supply chains

	Traditional Manufacturing	Additive Manufacturing
Material Resource Providers	•••••	•••••
Manufacturing of Parts and Components	••••• ↔ •••••	Localized Production
Assembly of Parts and Components	•	•••••
Retailer or Distribution	•••••	•••••

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THE IMPACT OF 3D PRINTING ON SUPPLY CHAINS


Courtesy of Jones Lang LeSalle

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3DP Impact on Supply Chains

- Less inventory required
- Local production
 - Less nodes = reduced risk of disruptions
 - Less transportation = less pollution
- Requires less resources (energy and materials)
- Produces less waste
- Quick delivery time
- Availability of parts at difficult to reach places (emergency recovery, ships, offshore, space stations)
- New suppliers, e.g. local print centers
- Glocalization (a global implementation of local models)
- Prosumers

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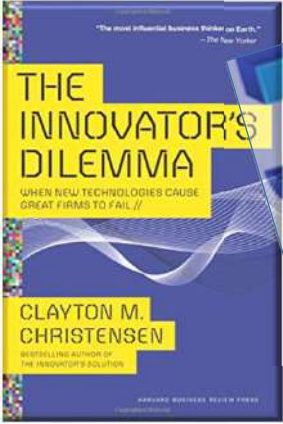
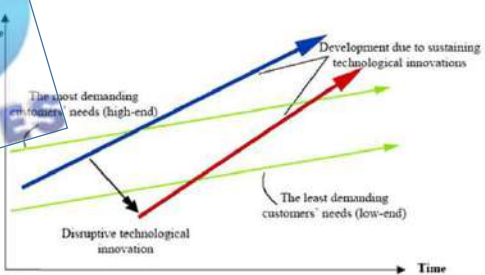


The effect of 3DP on Logistics

- Less import and export, more local production
- Increased customization:
 - larger amount of small shipments
 - Increased prices
- Supply chains of raw materials: powder, liquids, and filaments
- Prosumers will be new customers
- Pallets in, parcels out
- 3PL become producers (refer to the Port of Rotterdam where recently the first 3D-printed and certified ship propeller was made)

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The Theory of Disruptive Innovation

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BlackBerry

free record shop

Kodak

YAHOO!

myspace..

NOKIA

XEROX®

*Once famous companies
that got disrupted*

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Some final thoughts about
3D printing

- AM will not replace mass production but can exist side-by-side with traditional manufacturing
- AM enables new business models and supply chains
- Intellectual Property concerns exist
- AM will stimulate local employment/re-shoring
- Product liability laws are unclear, IP laws fall short
- Quality Assurance needs re-think
- Current lack of standards is a problem
- Limited but growing choice of raw materials
- The technology still is developing rapidly

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3D PRINTING IS A DISRUPTIVE TECHNOLOGY, BUT...

A 2015 McKinsey survey under leading manufacturers showed that:

- 40% are unfamiliar with 3DP besides what they have read about it in the press
- 33% said it is not relevant in the next few years
- 5% believed it does not apply to them
- 12% want to learn more about 3DP
- 10% thought 3DP is relevant to them.

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Managers need to start considering the effects of 3DP to their business or risk to be disrupted.

3D printing is a disruptive technology!

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TAKE ACTION

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<p>THANK YOU</p> <ul style="list-style-type: none">• MORE INFORMATION AT:• INFO@3DSTRATEGIES.NL	