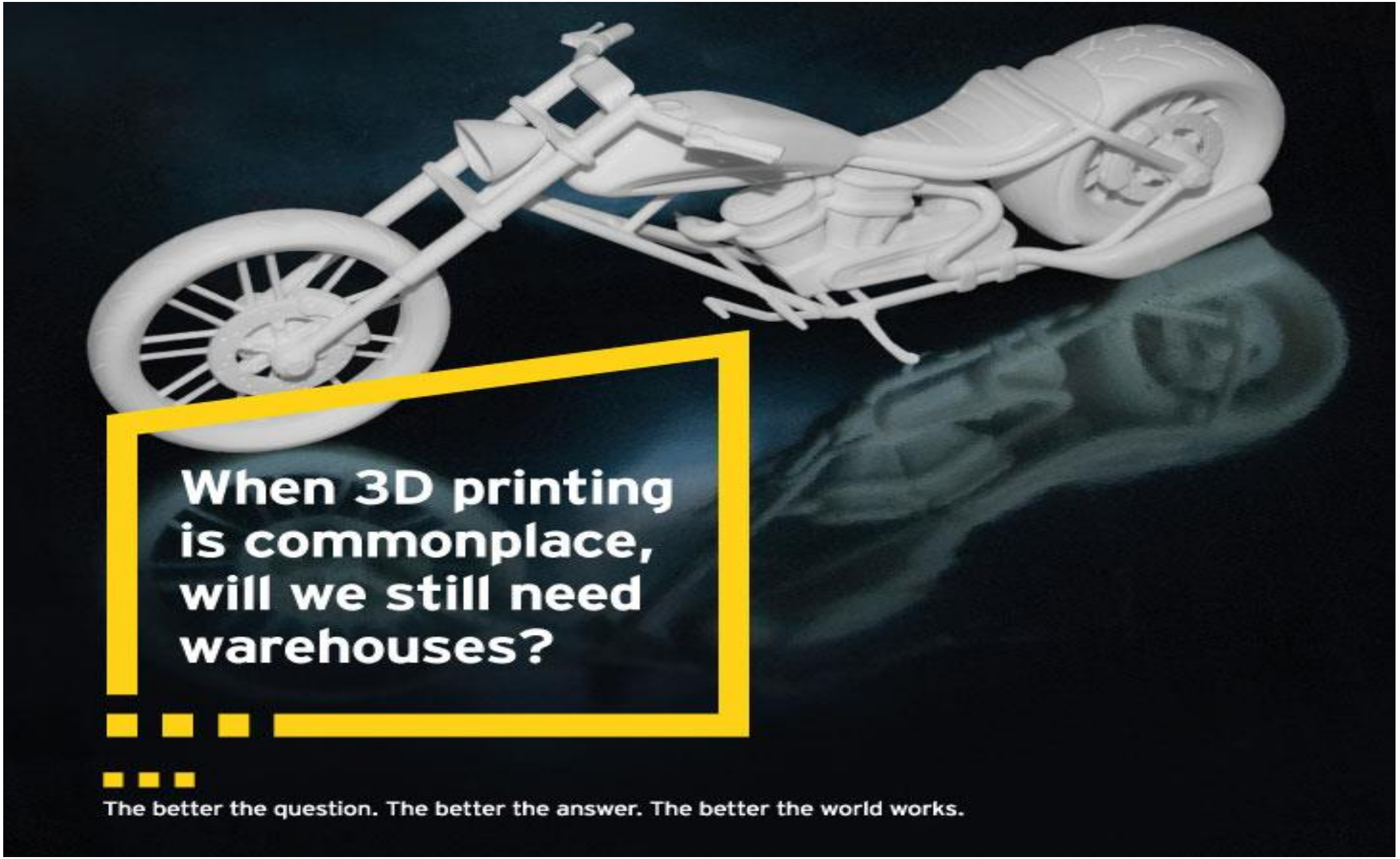
THE FUTURE OF GLOBAL SUPPLY CHAINS

MIKE WILSON | ATHENS | 27 MARCH 2018


When 3D printing is commonplace, will we still need warehouses?
The better the question. The better the answer. The better the world works.

Innovation Concern for Logistics

*"**LSPs are not very innovative**…….*
logistics–related improvements are mainly driven by LSP customers although customers increasingly expect new and innovative solutions from their LSPs and improvements of delivered services over time"

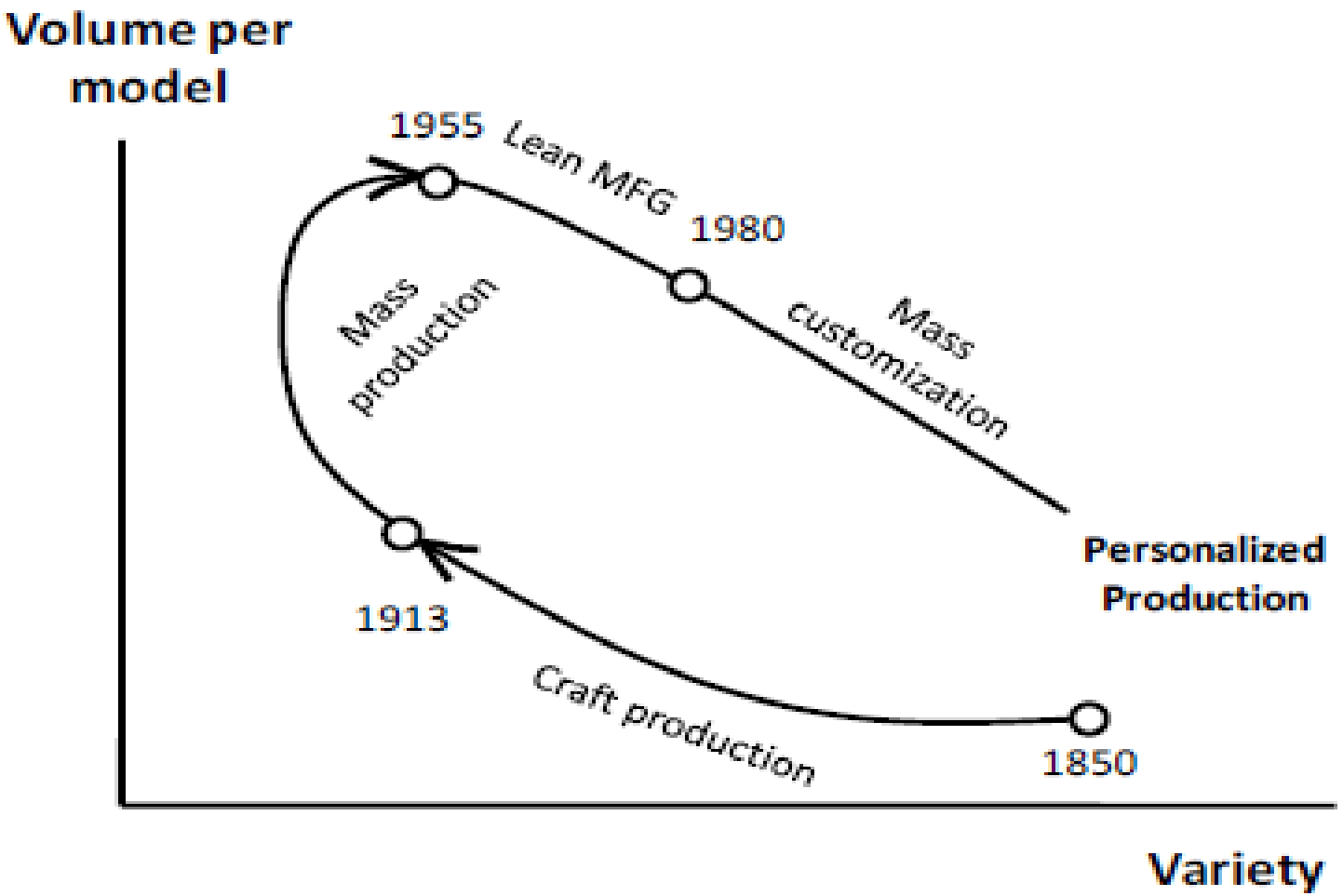
Busse and Wallenburg, 2011

Gap in Academic Research Too!

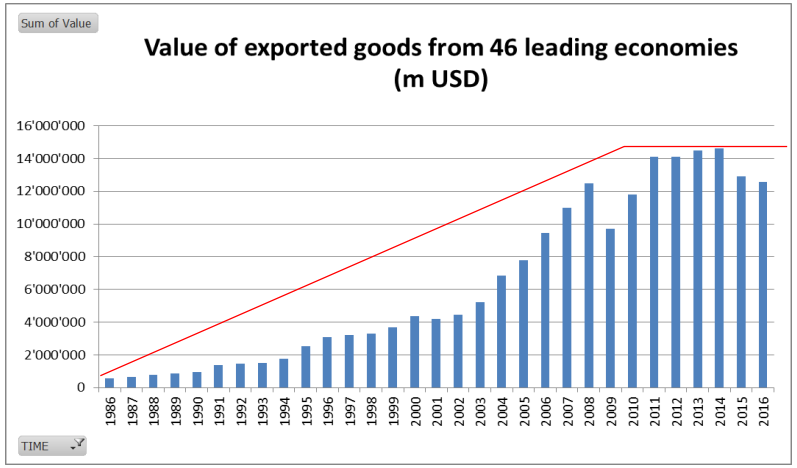
"Logistics research has
largely ignored
the concept of innovation"

Flint et al. 2005

A DRAMATIC CHANGE FOR OUR CUSTOMERS…



GLOBAL SUPPLY CHAINS ARE CHANGING



OECD 2017

Globalisation

The previous decades have witnessed a huge increase in the international flow of goods

Offshoring

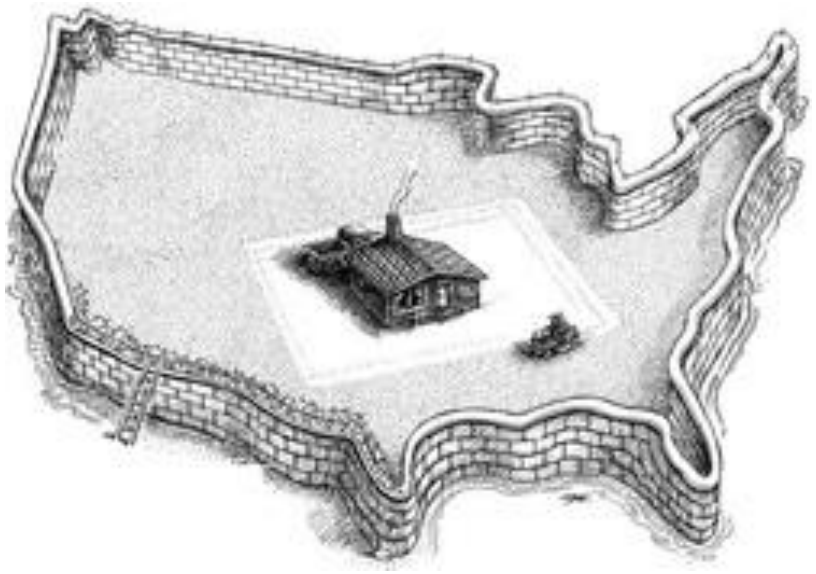
- Transfer of production to low cost geographies
- Outsourcing of manufacturing and supply chain activities
- Supply chains became elongated and complex

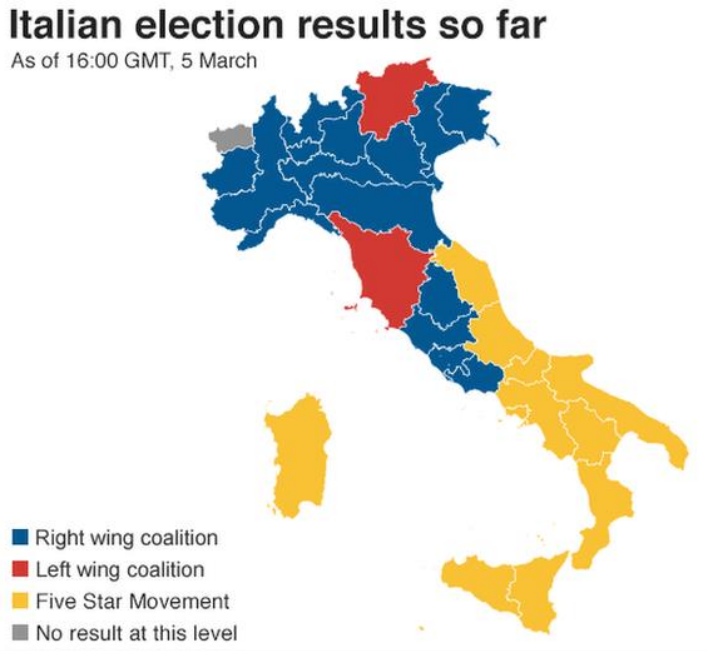
Stagnation

Between 2011 and 2014 export of manufactured goods has stabilized and even declined in 2015 and 2016

CHINA WAS THE FACTORY OF THE WORLD

FROM GLOBAL TO LOCAL



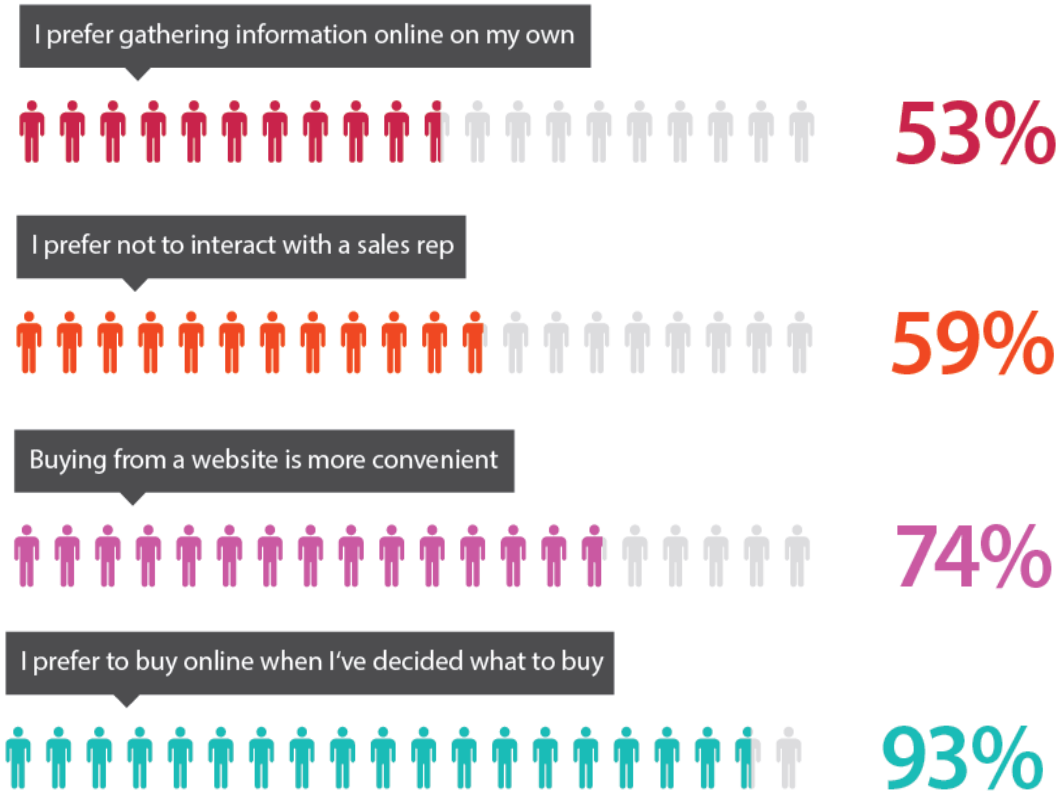


THE SINGLE BIGGEST CHANGE TO SUPPLY CHAINS IS NEW BUYING BEHAVIOURS

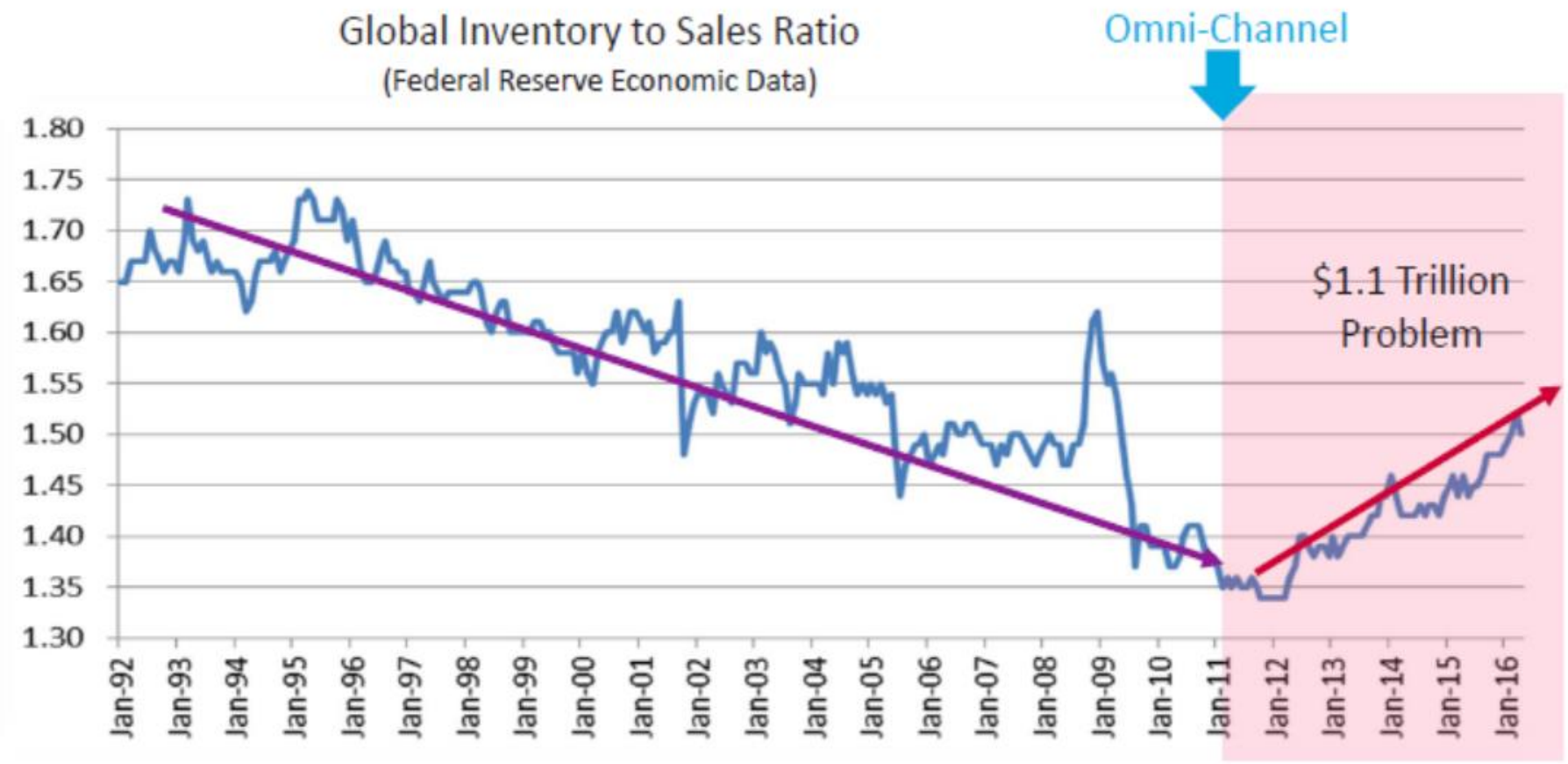
The Millennials:

- 25% of the world population in 2017
- Major influence on how things are purchased
- Most do not even remember the times without the Internet

27% of the world's trade will be done on-line by 2020



INVENTORIES ARE INCREASING



Visibility
- Slow, inaccurate data
- Silo'd channels

Latency
- Disparate systems
- Slow response

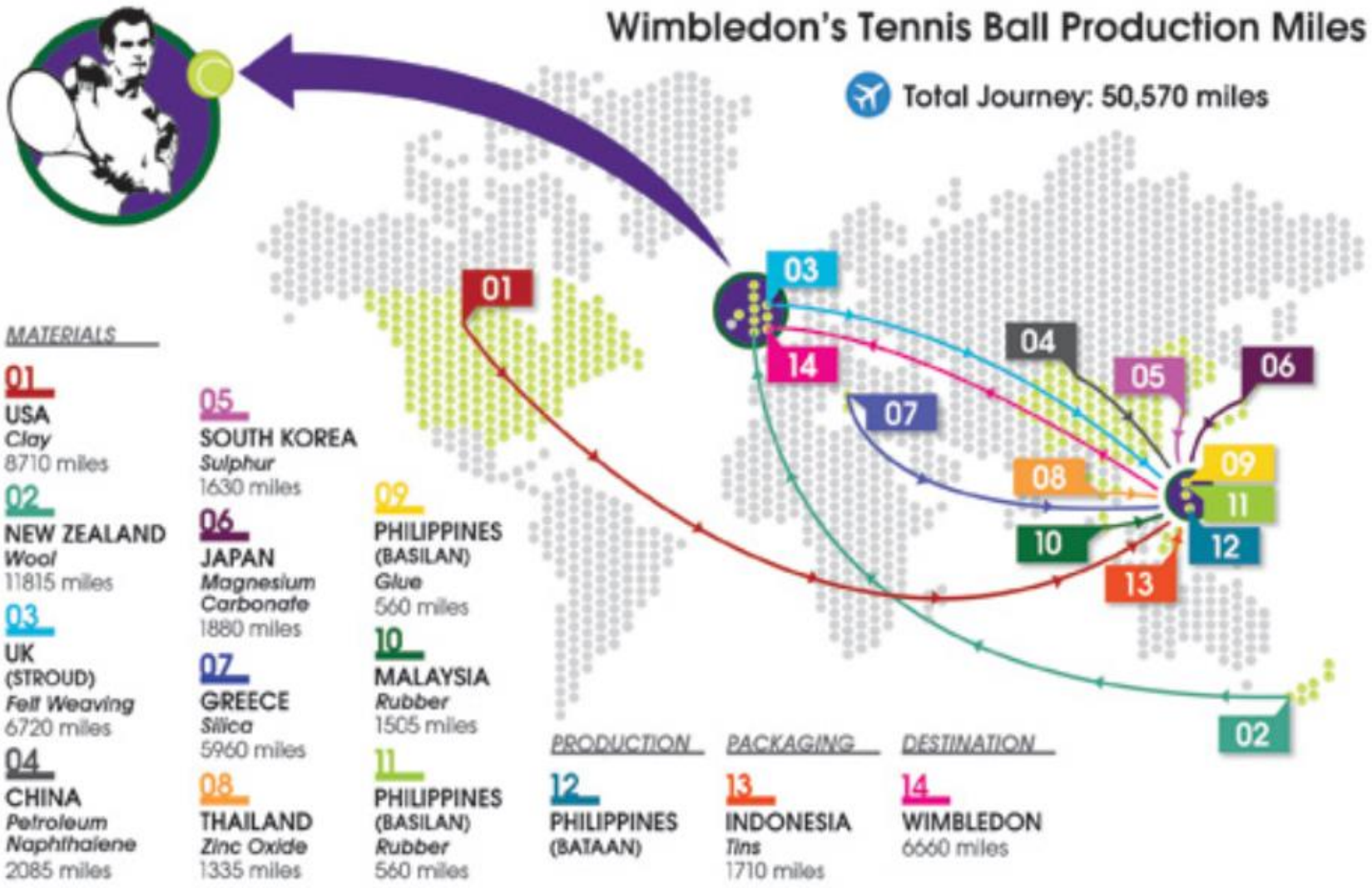
Wrong Product
- Wrong assortment
- Bad positioning

What worked for the last two decades is **no longer fit** for today's e-com driven world.

OEMs rely on 3PLs as subcontract manufacturers of aggregated services, turning fixed cost into variable cost

Customers are struggling to adapt; inventory is rising because the Take Make Dispose supply chain doesn't satisfy market demand – **demand has outpaced supply chains**

SUPPLY CHAINS ARE BADLY DESIGNED, INEFFICIENT AND RIGID



http://www.wbs.ac.uk/news/the-50-000-mile-journey-of-wimbledon-s-tennis-balls/

HOW ARE SUPPLY CHAINS CHANGING

YESTERDAY

NOW & FUTURE

Distributed Manufacturing close to local demand

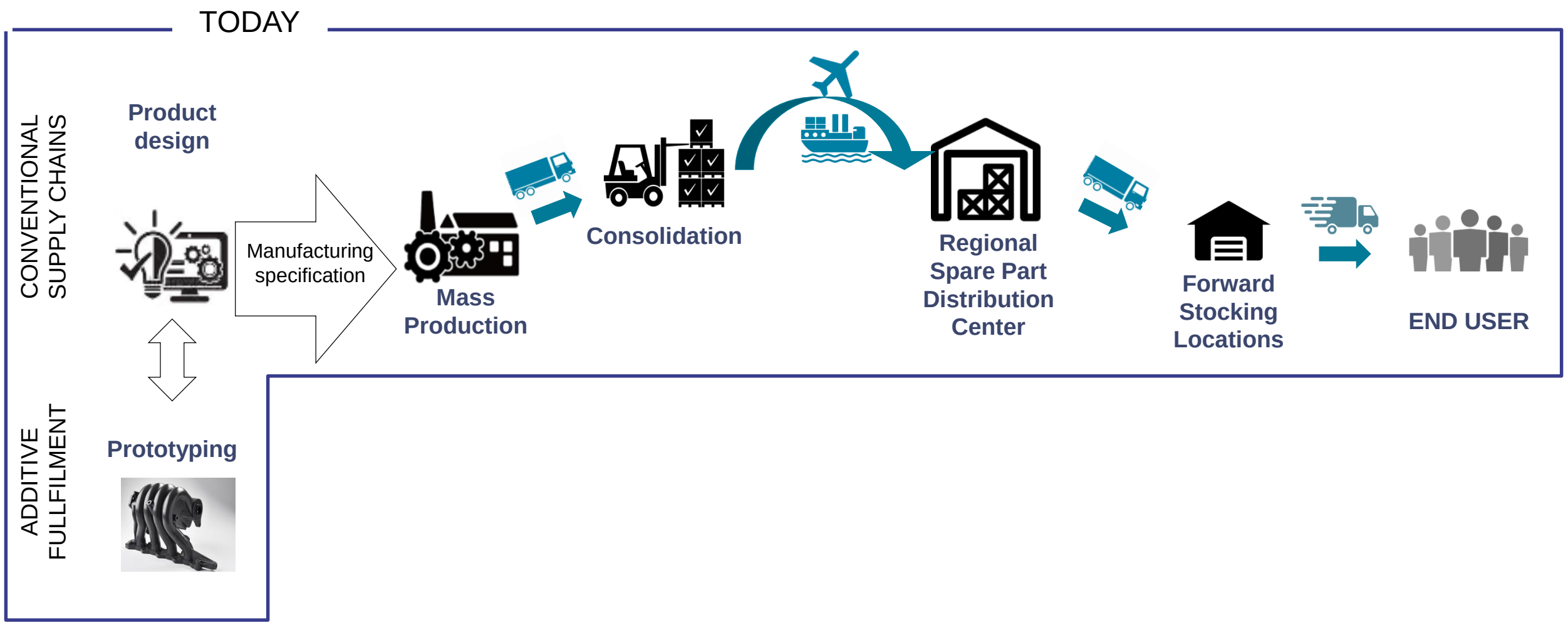
Centralized Manufacturing far from local demand

Co-designed, modular products, personalized and 3DP close to demand

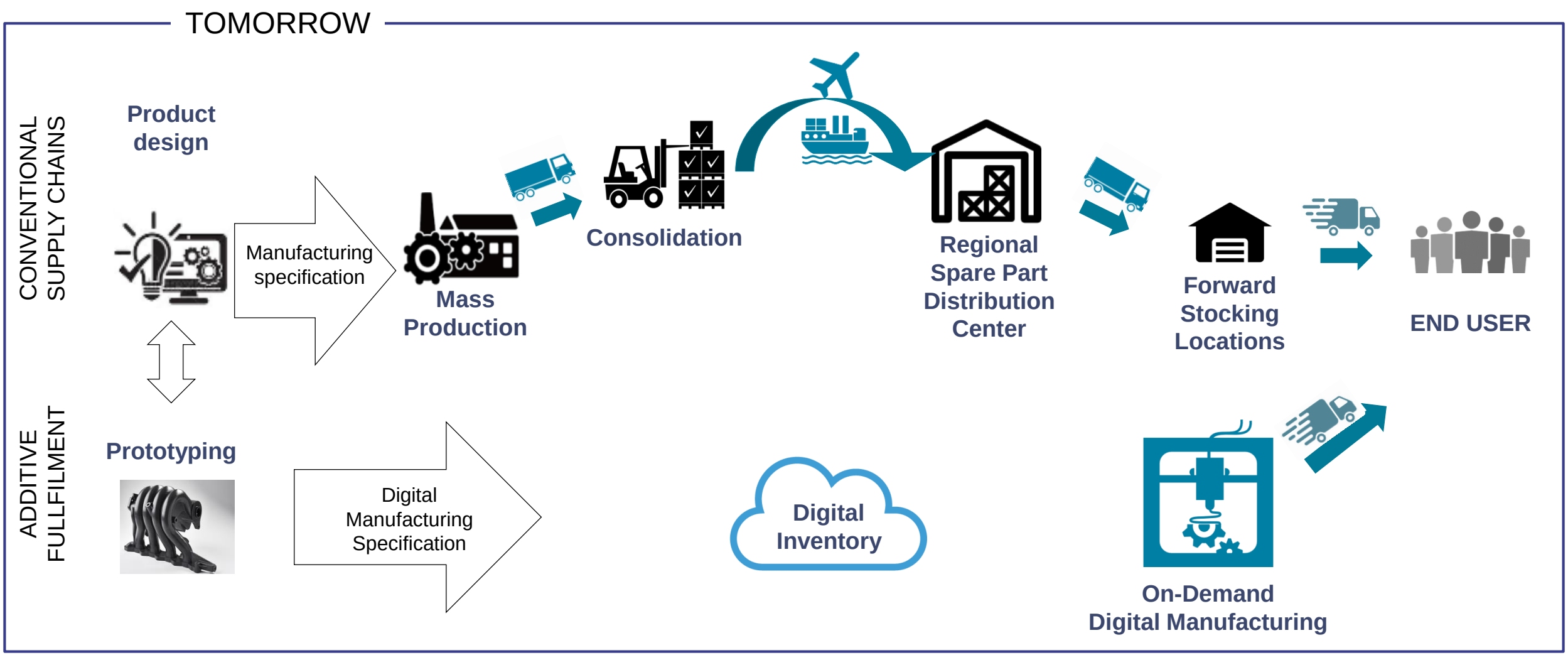
Circular supply chains focused on Extended Product Life Cycles

WHAT WE ARE DOING TO RESPOND

ADDITIVE MANUFACTURING IN SPARE PARTS SUPPLY CHAIN



ADDITIVE MANUFACTURING IN SPARE PARTS SUPPLY CHAIN



KTP OUTPUT: PRINTABILITY INDEX

3D Printability Analysis
Demonstrator

PANALPINA on 6 continents

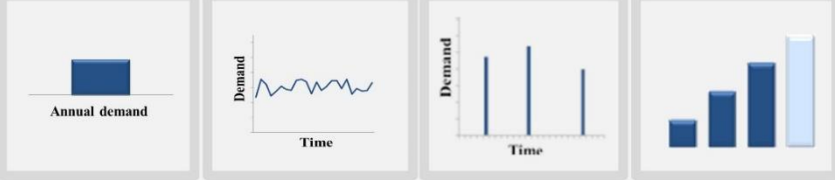
3D Printing has been proved that can facilitate the improvement of both manufacturing and supply chain aspects. However, the critical question is at which products the companies should turn their focus first? The 3D printability analysis has been designed to investigate which single-material components are most likely to benefit from shifting the manufacturing process from traditional to 3D printing taking into account the objective to be achieved.

Instructions:

Click for details

Drop Down lists

Engineering			Weight: 50%	Supply Chain			Weight: 50%
Geometry		Purpose		Demand			Part Criticality
Part Size (Sphere with diameter)	Design Complexity	Functional requirements		Level (Annual demand)	Volatility	Frequency	
5 cm < D < 15 cm	*Design with major inner/outer features*	*Functional part with mech. requirements*		*Hundreds*	*Low volatility*	*Low frequency*	*Important*



Forecast

Cardiff Business School Ysgol Busnes Caerdydd | Cardiff School of Engineering | Innovate UK | EPSRC Engineering and Physical Sciences Research Council

PROOF OF CONCEPT – 3D PRINTING

DESIGN	PROTOTYPE		FINISHED PRODUCT