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Digital



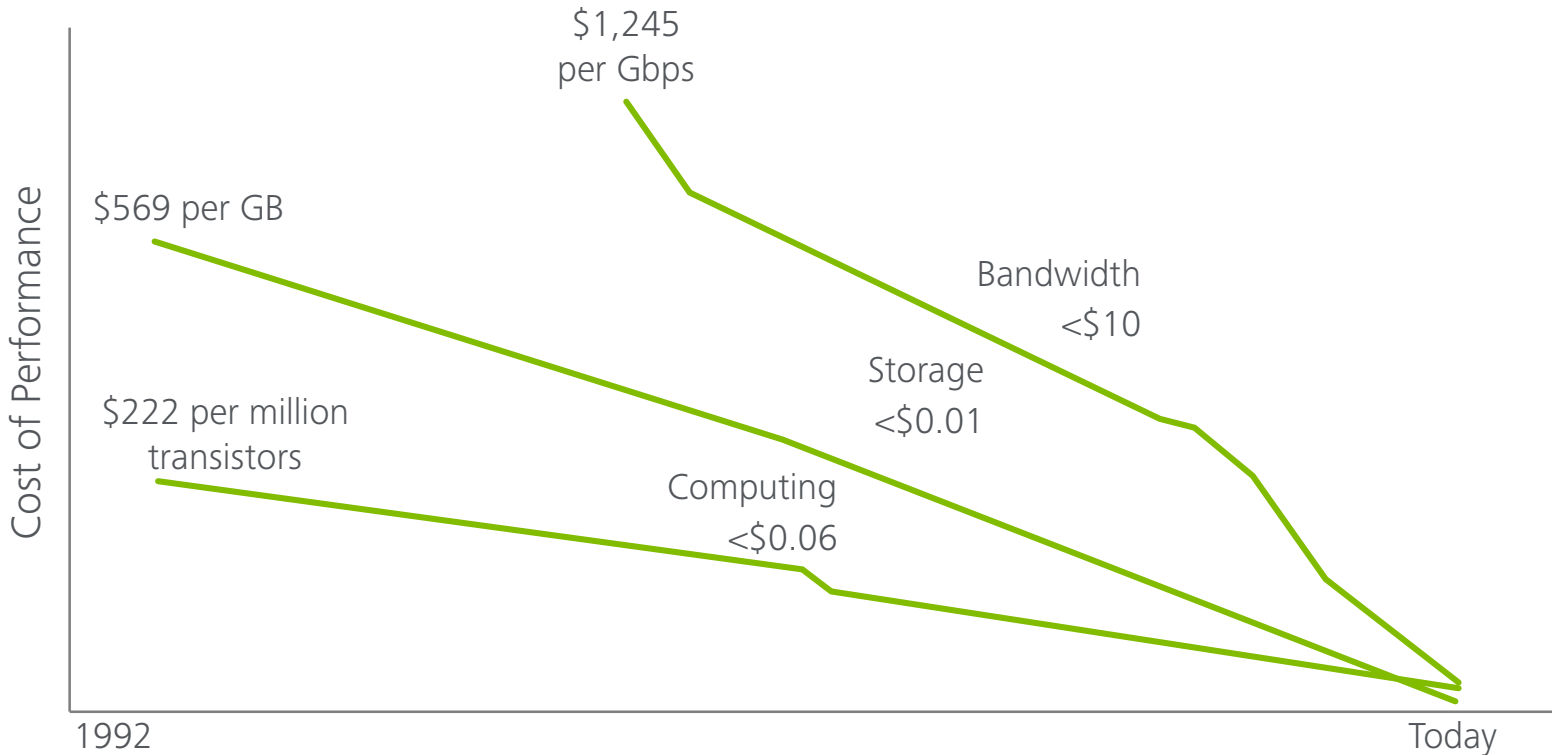
OCTOBER 2017

Digital Supply Networks

DISRUPTION SPANS ALL INDUSTRIES

Exponential Technology Change...

...Disrupting Supply Chains Across All Industries



Source: Deloitte University Press



OUR 4TH AND CURRENT INDUSTRIAL REVOLUTION

Power Generation

Late 18th century



Industrialization

Early 20th century



Electronic Automation

1970s to 2000s



Digital Supply Networks

4th Industrial Revolution



Optimize Traditional Objectives...

Cost	Innovation	Service
Quality	Safety	Flexibility

...and New Objectives...

Revenue

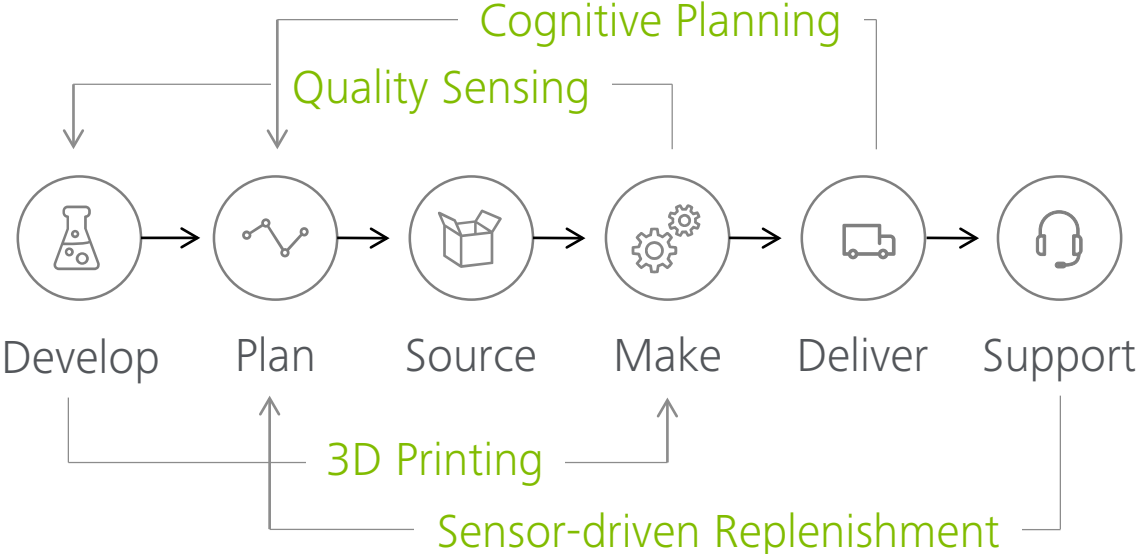
...By Better Managing

Visibility	Variability
Volume	Velocity

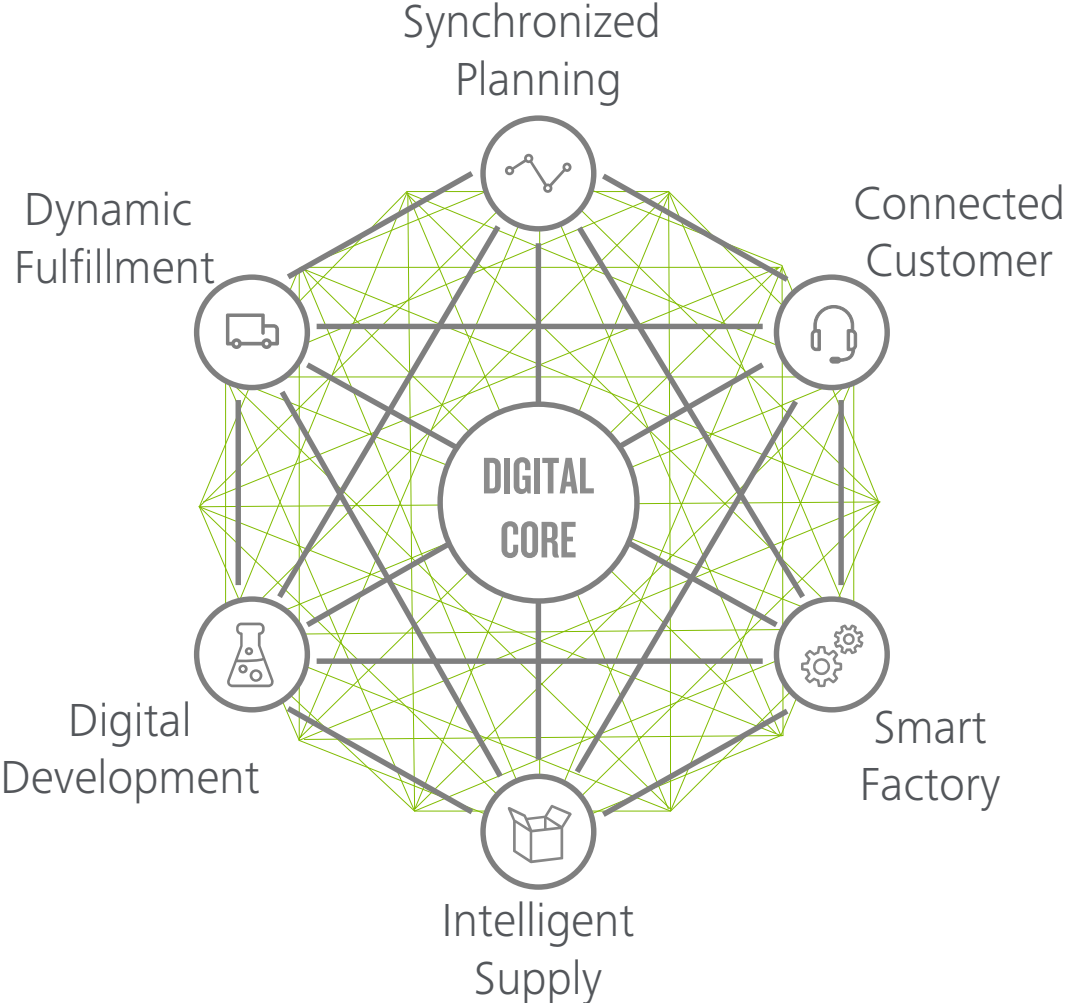


EVOLVING THE SUPPLY CHAIN TO A DIGITAL SUPPLY NETWORK (“DSN”)

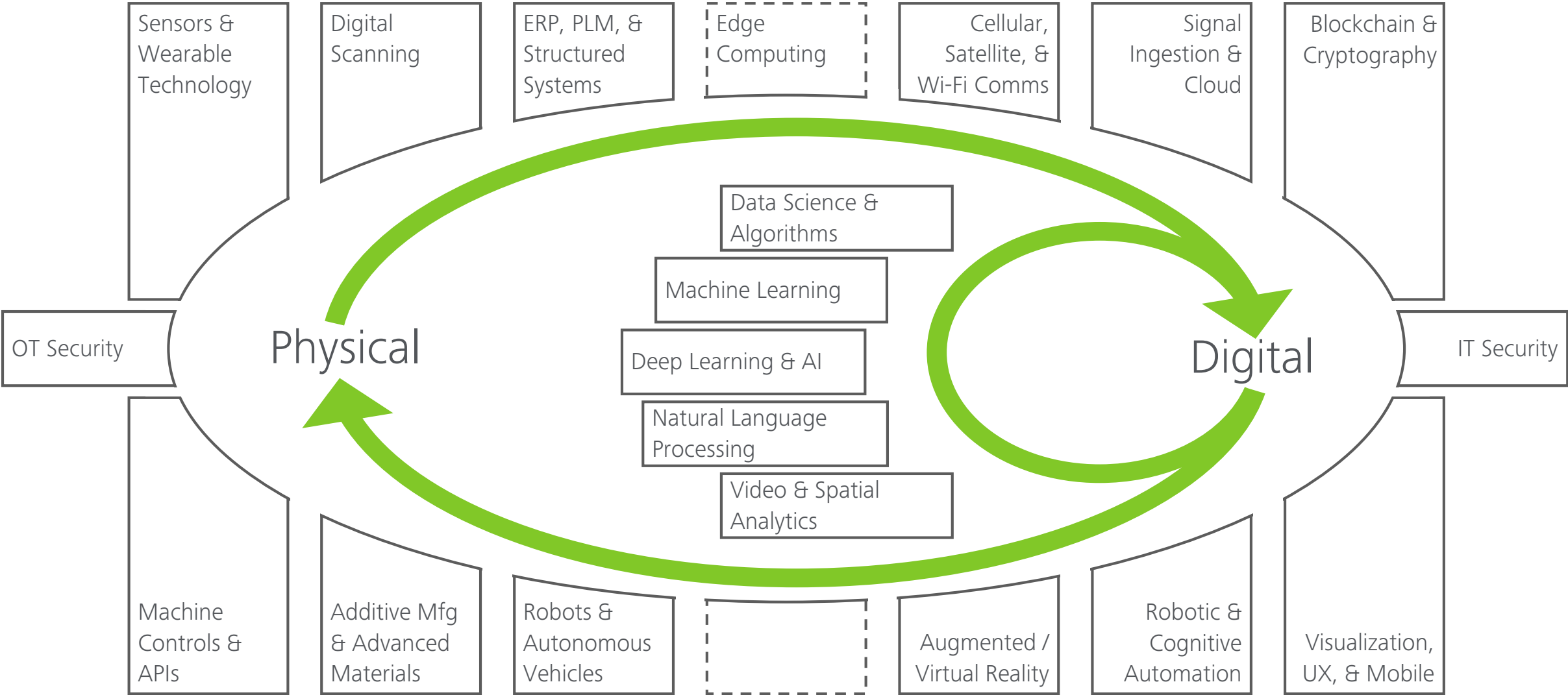
TRADITIONAL SUPPLY CHAIN



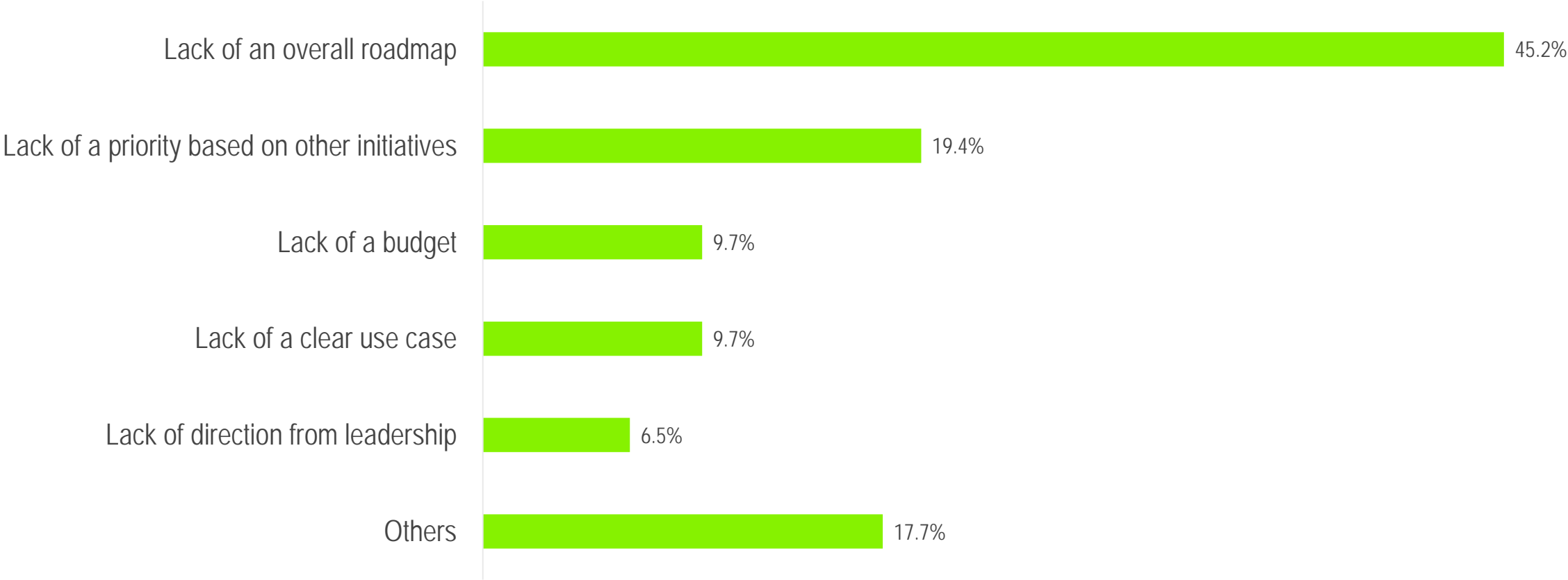
DIGITAL SUPPLY NETWORKS



DIGITAL SUPPLY NETWORK TECHNOLOGIES



The biggest roadblocks organizations face in beginning a digital pilot are...

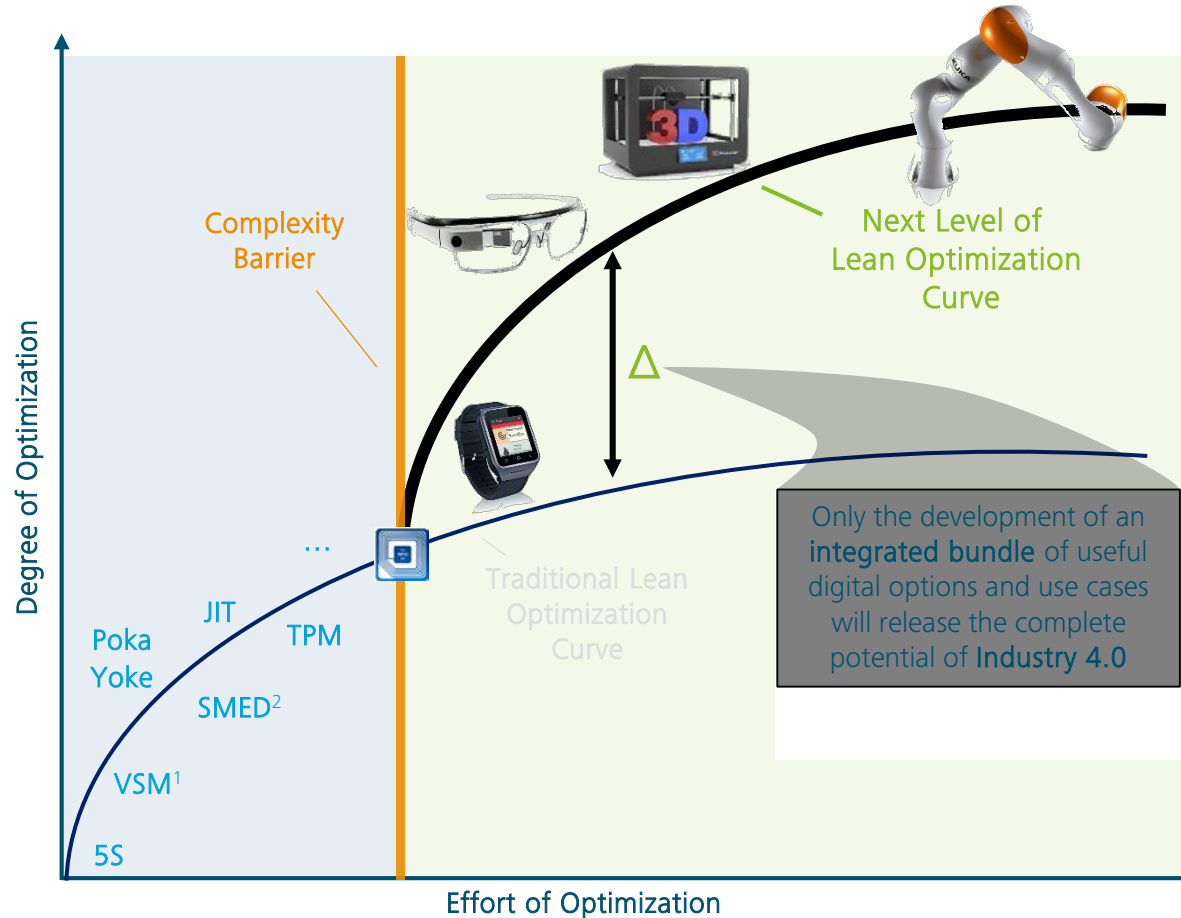


Source: SCM World 2017

THE COMPLEXITY BARRIER

Overcome complexity and enabling Next Level of Lean Manufacturing

Lean 4.0 Optimization Curve



1) VSM: Value Stream Mapping
2) SMED: Single Minute Exchange of Die

Complexity Challenges:

- Higher degree of product **individualization**
- Increasing **product complexity**
- Greater **variety** of variants
- Demand for high **flexibility**
- **Limited usability** of classic Lean optimization methods

Next Level of Lean Manufacturing:

- Use **Industry 4.0** as a suitable "tool" to **enrich classic Lean**
- Build up **integrated** optimization solutions
- Pursue the **economic useful** instead of technical possible

DIGITAL SUPPLY NETWORK CAPABILITIES



Digital Development

Optimize product lifecycle management with advanced digital tactics



Synchronized Planning

Provide significant efficiencies through synchronization



Intelligent Supply

Reduce costs through new advanced technologies, models, and capabilities



Smart Factory

Unlock new efficiencies by a more connected, agile, and proactive factory



Dynamic Fulfillment

Boost customer service through new levels of speed and agility



Connected Customer

Create seamless customer engagement from inspiration to service

Control Tower (End-to-End Visibility)

Demand & Supply Sensing & Synchronization

Smart Connected Products / Real-Time Product Intelligence

Robotic & Cognitive Automation

Additive Manufacturing

Real-Time Collaboration & Integration (Partners & Products)

Quality Sensing & Prediction

Dynamic Network Load Balancing & Synchronization

Environmental & Social Impact

Predictive / Sensor-Driven Replenishment

Model-Based Design & Manufacturing / Design for Manufacturing Innovation

Design Simulation

Design for Cust. Exp.

Material / Asset / Product Tracking & Visibility

Autonomous Transportation

Cognitive Source-to-Contract

Autonomous & Augmented Factory Automation

Pro-Active & Collaborative Supplier Management

Predictive Maintenance

Automated Purchase-to-Pay

Advanced Worker Solutions

Intelligent Procurement Operation Management

Autonomous & Augmented Warehouse Operations

Should-Cost Modeling

Personalized Fulfillment

Cog. Spend Analytics

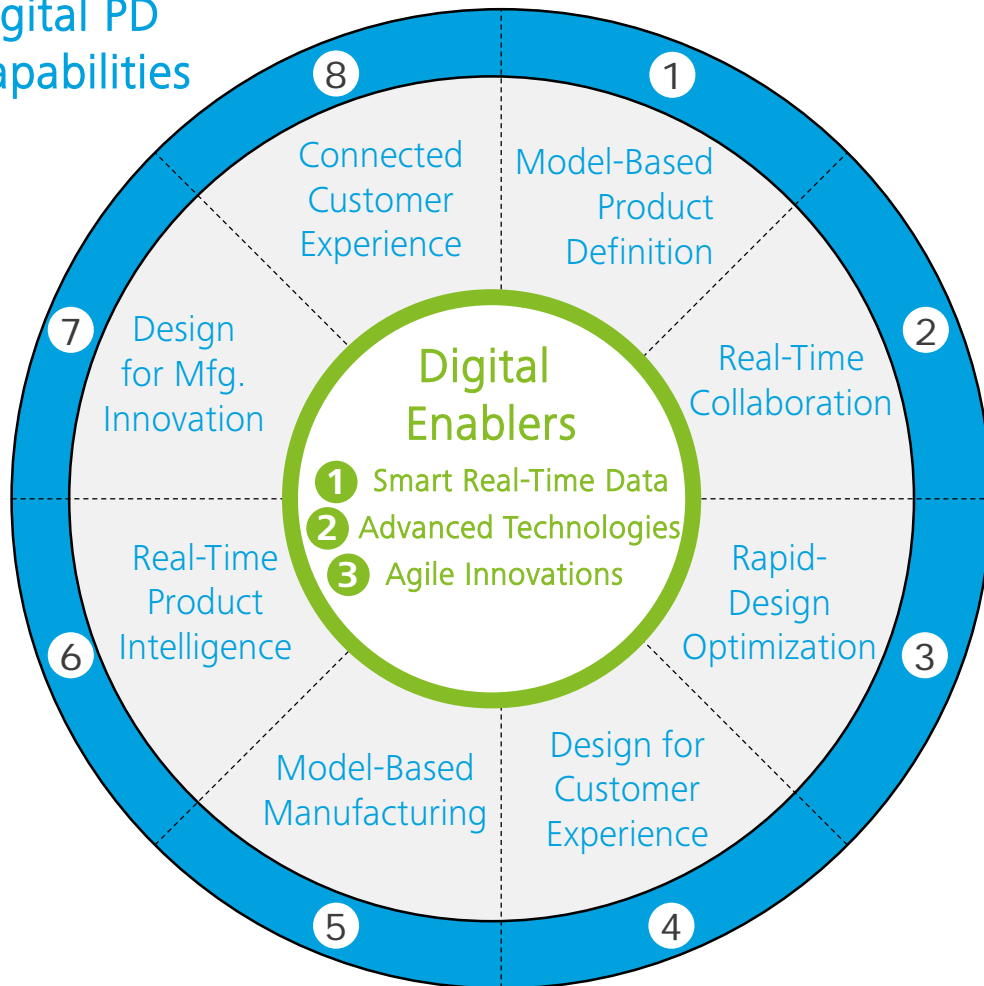
Adv. Plan & Sch. Optim.

Store Operations

Efficient Return Management

DIGITAL PD CAPABILITIES, TRANSFORMED BY DIGITAL ENABLERS, HELP UNLOCK AMPLIFIED BENEFITS TO ORGANIZATIONS

Digital PD Capabilities



Potential Business Impacts



Speed up Time-to-Market by 50%

- Concurrent engineering / Real-time Collaboration
- Rapid prototyping and virtual design simulation
- Improved R&D / engineering organizational Efficiency



Reduce Cost by 20-50%

- Product portfolio rationalization
- Reduced material and labor spend through manufacturing innovation
- Less inventory



Increase Market Share by 20% - 30%

- Improved customer experience with individualized design
- Integration of IoT, sensors / data-driven design enhancements
- Open innovation / customer co-creation

Potential PD Enhancements



Improve Design Quality

- Early identification of requirements issues
- Enhanced system design integrity
- Fewer errors during integration and testing
- Consistency in design approach across programs



Increase Productivity

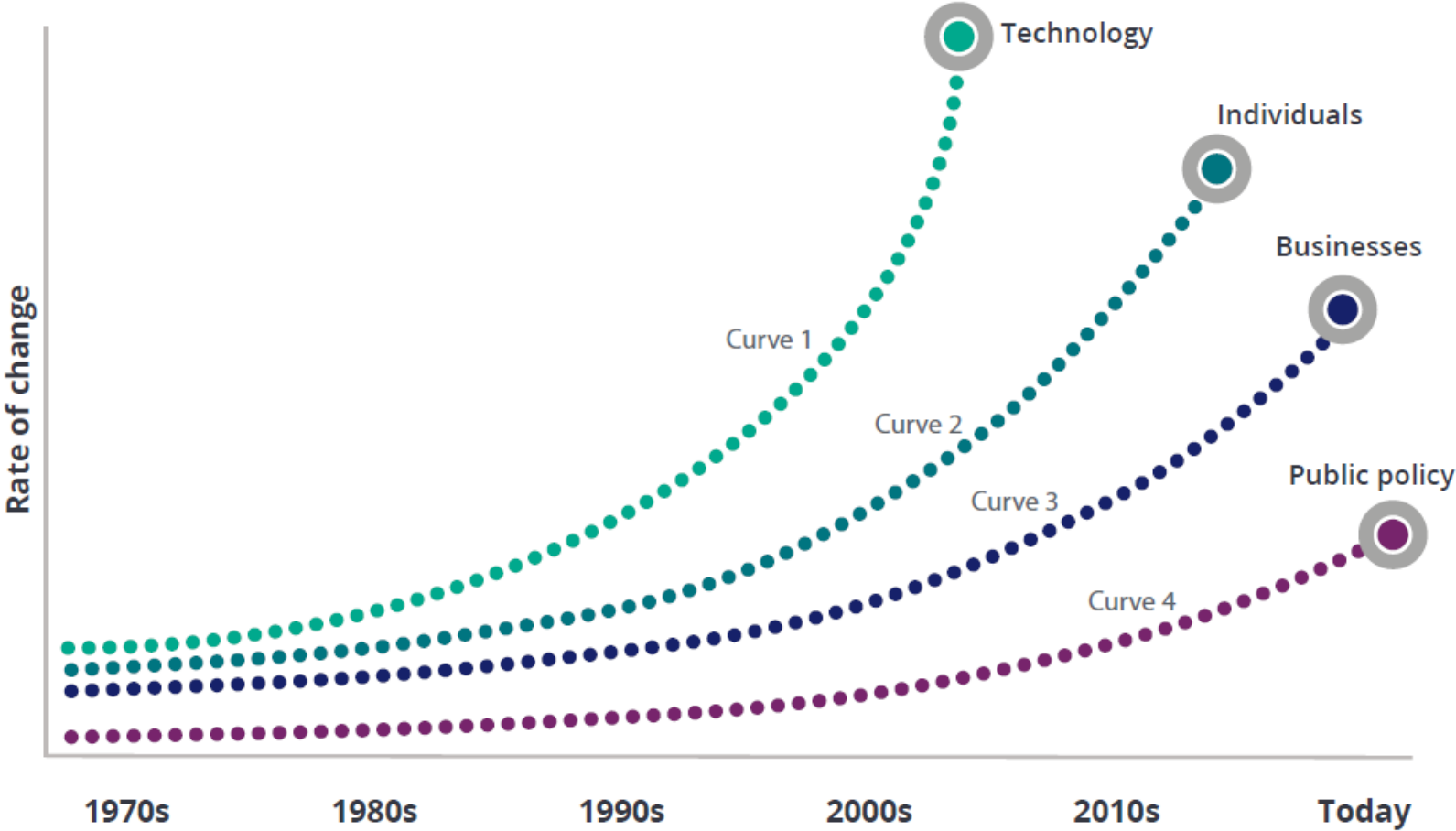
- Improved impact analysis of requirements changes
- Improved interaction across a multi discipline team
- Reuse of existing models to support design and technology evolution
- Auto-generation of design documentation



Enhance Communication and Visibility

- Reduced communication barriers across regional and functional barriers
- Real-time collaboration with a digitized footprint as single source of truth
- Early, and on-going, requirements validation and design verification

PACE OF CHANGE IS ACCELERATING, YET FOUNDATIONAL ELEMENTS ARE SLOW TO REACT



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FOCUS DRIVING FORWARD



Workforce Skills & Capabilities

- Identify capability gaps
- Establish new recruiting techniques
- Refresh retention and development tactics



Develop Ecosystem of Supply Chain & Technology Partners

- Lean on your partners for insights and recommendations
- Share risk and be open to co-development
- Facilitate open communication across all functions & areas



Identify Data Analytics Opportunities

- Link insight strategy to business strategy
- Prioritize pilots with short time to value
- Apply innovative science to the old problems



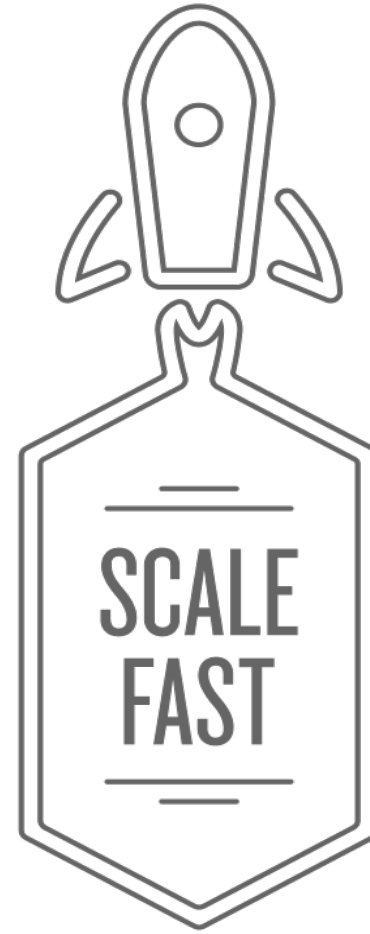
Enable Agile Systems Development & Deployment

- Apply agile tools (e.g. cloud) and approaches at every turn
- Remember that speed matters
- Don't be afraid to 'fail fast' and 'fail forward' to grow



Manage Cyber Security Risk

- Embed security as a central theme
- Remember importance of OT security
- Develop emergency mitigation plan



THANK YOU.

Stephen Laaper
Principal
Deloitte Consulting LLP
slaaper@deloitte.com
312.513.7900

www.deloitte.com
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