



Konica Minolta Business Innovation Center

Advance Technology/Big Data Lab

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Preparing for Coming 10 Years Trend of IoT

IoT Market Size (by 2025)

McKinsey&Company

\$6.1T



\$7.1T



\$14.4T

Connected Devices (by 2020)

Gartner

26B



32B



50B

Data Growth (2013 vs 2020)



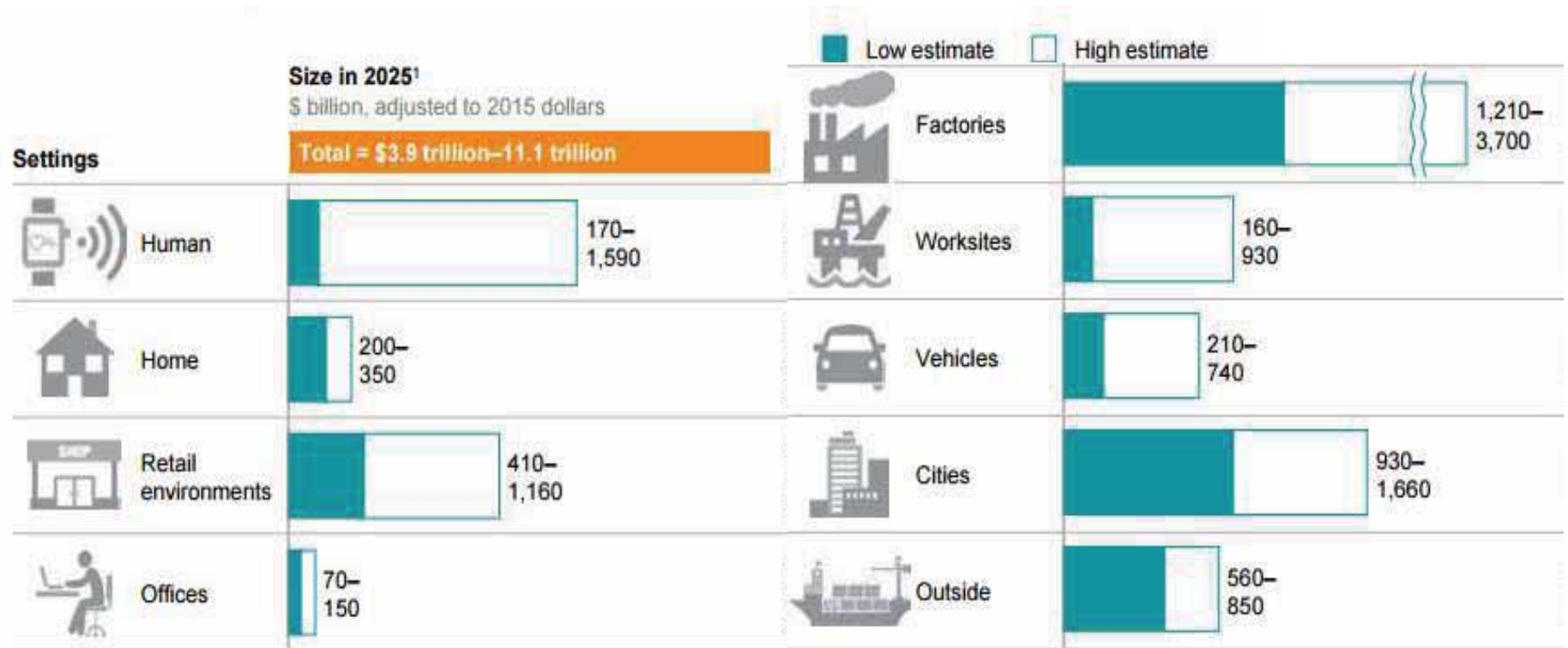
Total Data
4.4ZB → 44.4ZB

10x

IoT Data
.09ZB → 4.4ZB

49x

All segments got impact, an evolution of everything

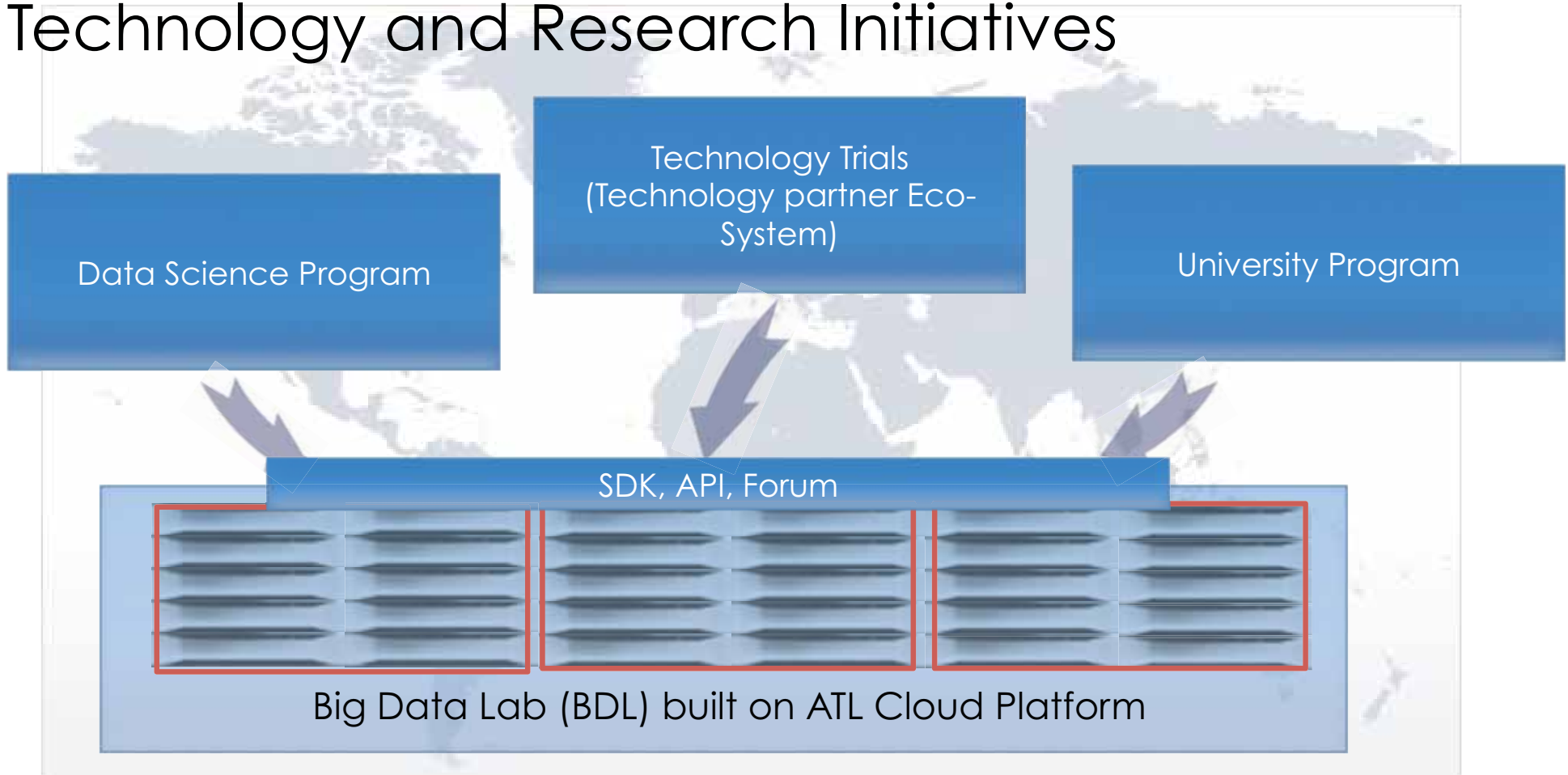


Potential economic impact of IoT in 2025, including consumer surplus, is \$3.9 trillion to \$11.1 trillion

The Players are Dazzling and Diversified

THE THINGS	LIFE SAFETY	HOME SECURITY	TAGS & TRACKERS	HOME AUTOMATION	AUTO-MOTIVE	COMMUNICATION	LIFESTYLE & ENT.	WEARABLES	FITNESS & HEALTHCARE	INDUSTRIAL INFRA.	TOYS	
THE INTERNET	APP MARKETPLACE		HOME AUTOMATION	CONTROLLER/HUB	IoT OPERATING SYSTEMS	IoT DEV FRAMEWORK	BIG DATA/ANALYTICS	DEV TOOLS/CM	DISTRIBUTED APP			
	API / CLOUD SERVICES			DATABASE	STORAGE	CPU	SECURITY	DNS				
HARD INFRASTRUCTURE			INFRASTRUCTURE HARDWARE	NETWORK / CDN / TRANSPORT	FIBER	DATA CENTER	POWER / BATTERIES					

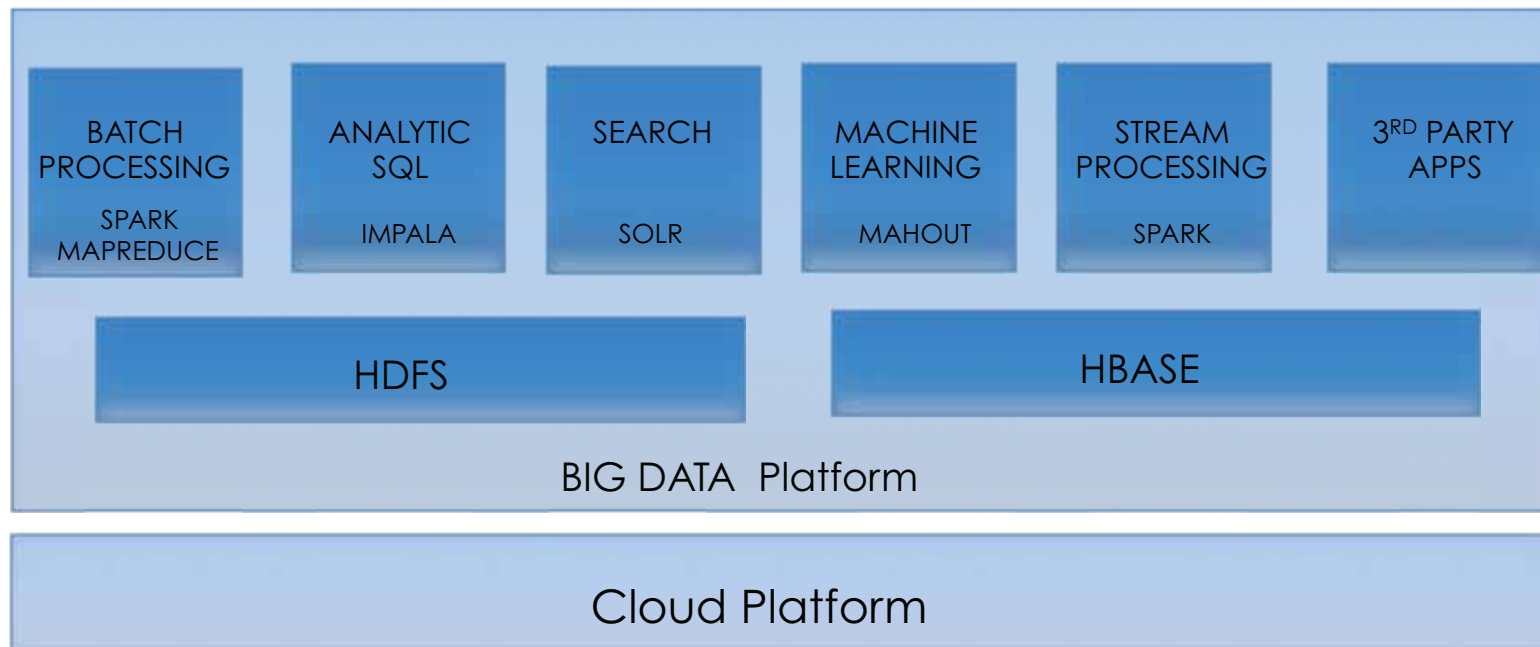
Konica Minolta BIC Technology and Research Initiatives



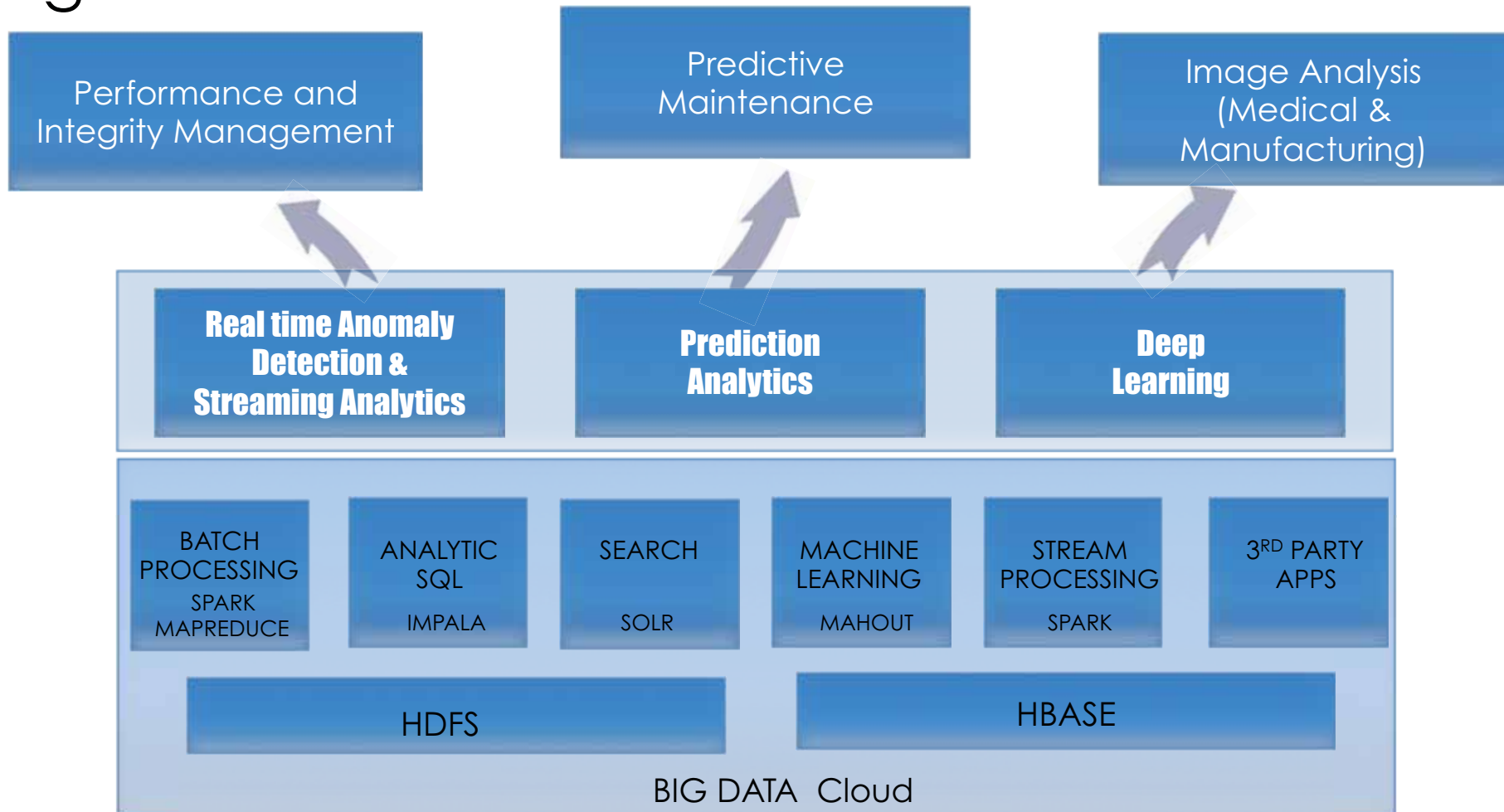
Big Data Lab

- Enable to quickly procure, provision, configure and deploy big data platform and analytical engines using collection of 3rd party technology and components
- A place to bring technology partners to integrate their data analytics applications, solutions and show live demonstration of data analytics services and hosted vertical solutions
- Test-bed for rapid prototyping, interoperability testing and evaluation of data analytics technologies, applications and services
- Hosting facility for rapid PoC development, testing and demonstration
- Enable rapid technology transfer of vertical solutions to KM BUs for scaling and productization

Big Data Infrastructure



Big Data Cloud



Applied Analytics

- IT Optimization
- Maintenance Services
- Healthcare
- Industrial/Manufacturing

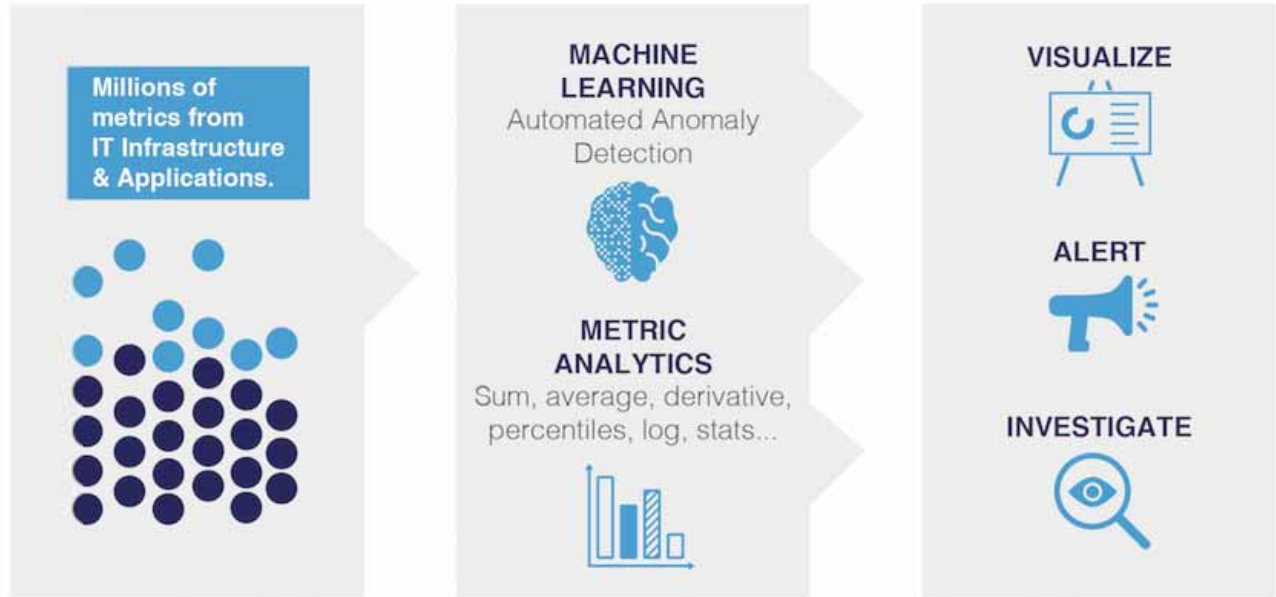
IT Services Optimization: Application Performance and Integrity Management **Real Time Business Insight**



Nino Vidovic, PhD

Metrics In, Insights Out

Automated machine learning drives faster and smarter decisions



66 Delayed business insights cost companies millions of dollars

KM's Self Service Cloud

Built on Predictive Analytics Platform With Augmented Reality



Nino Vidovic, PhD



Predictive Maintenance – Printing/Robots



1

Raw data fed into Predict Solution: Collected sensor data from deployed machines, including I/O and internal measured states and failure modes.



Printer **prediction target signals** are failure logs and yield metrics.



Printer **prediction target events** are occurrences of failure modes and yield thresholds.



Failure and yield prediction:

- Predictive maintenance reducing lost production.
- Revenue forecast per deployed asset based on actual field data.
- Classification/grading using machine history





Application Performance and Integrity Management

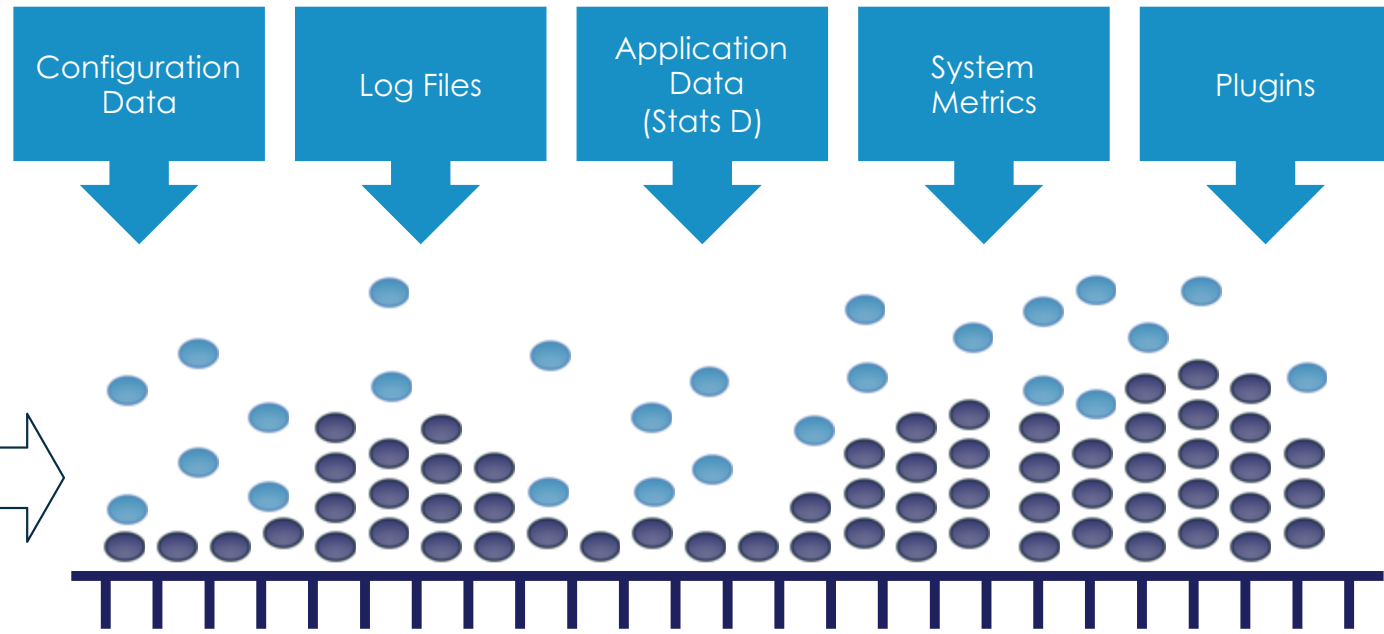
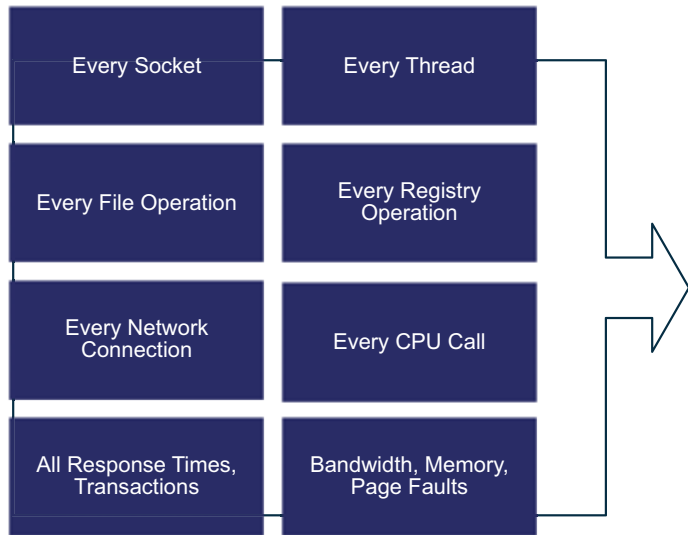
IT OPTIMIZATION

“Miss Nothing” Data Collection

Plus: One collector per OS also collects

ANY APPLICATION ANYWHERE

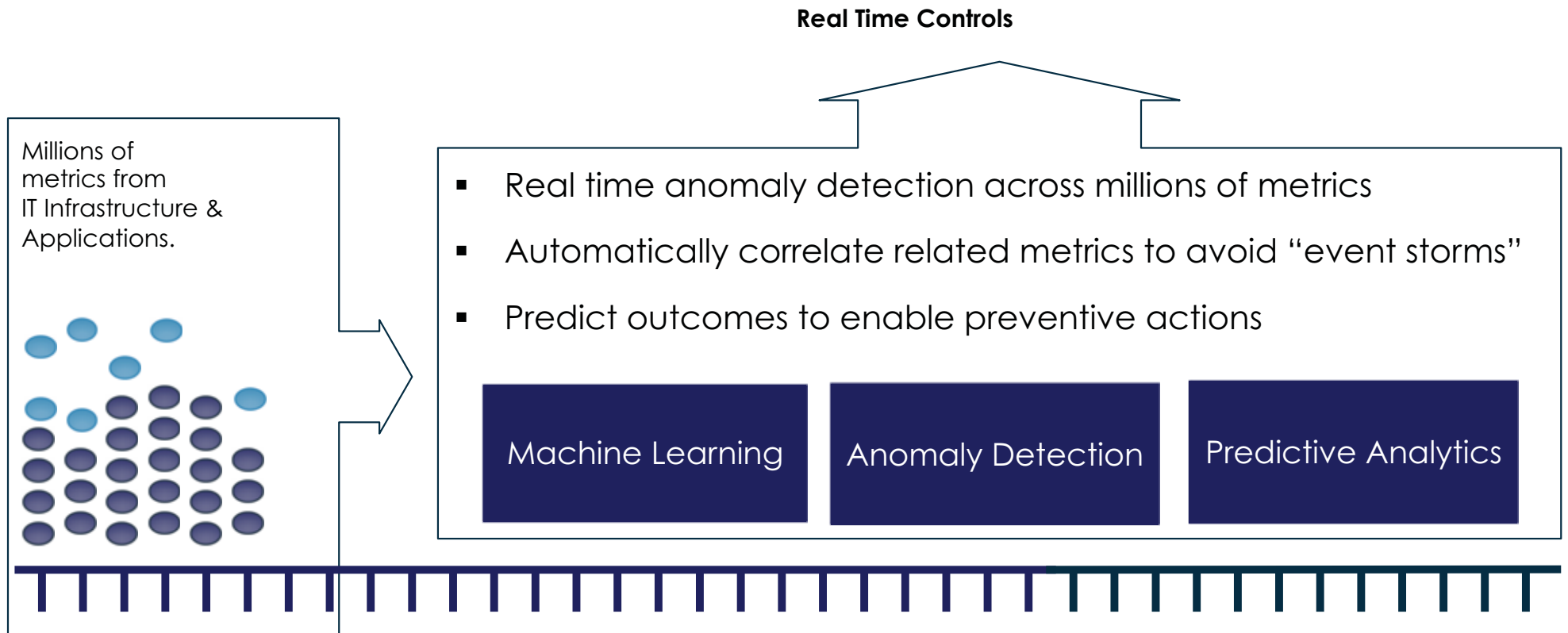
We See Every Event Across...



The most detailed data in the industry...

All Correlated Into A Single Time Series

Apply Analytics to find the Problem



Automatic Anomaly Detection in Five Steps



System features

Universal

- Any type of time-series data
- Tracks millions of metrics; no need to prioritize which metrics to track

Automatic

- Automatically learns – no thresholds to set
- Accurate alerts in real time
- Composite metrics track advanced business logic

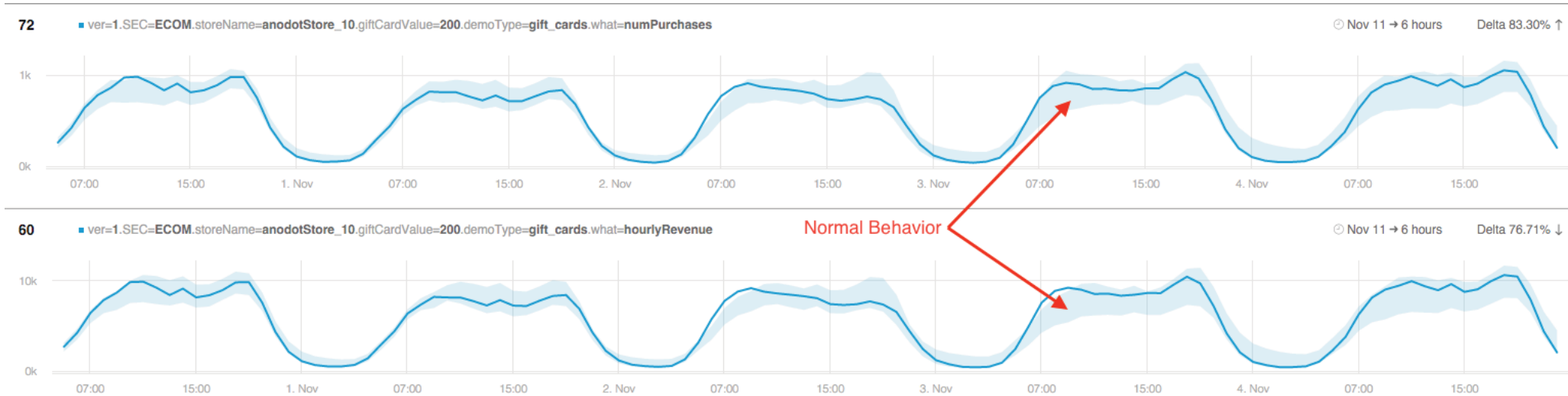
Concise

- Unique IP quickly & accurately learns normal behavior
- Automatic metric correlation reduces noise for rapid resolution

Together these lead to **Self Service Analytics with Swift TTV**

Normal Behavior Automatic Learning

Normal Behavior Learning should take into account seasonality, different signal types



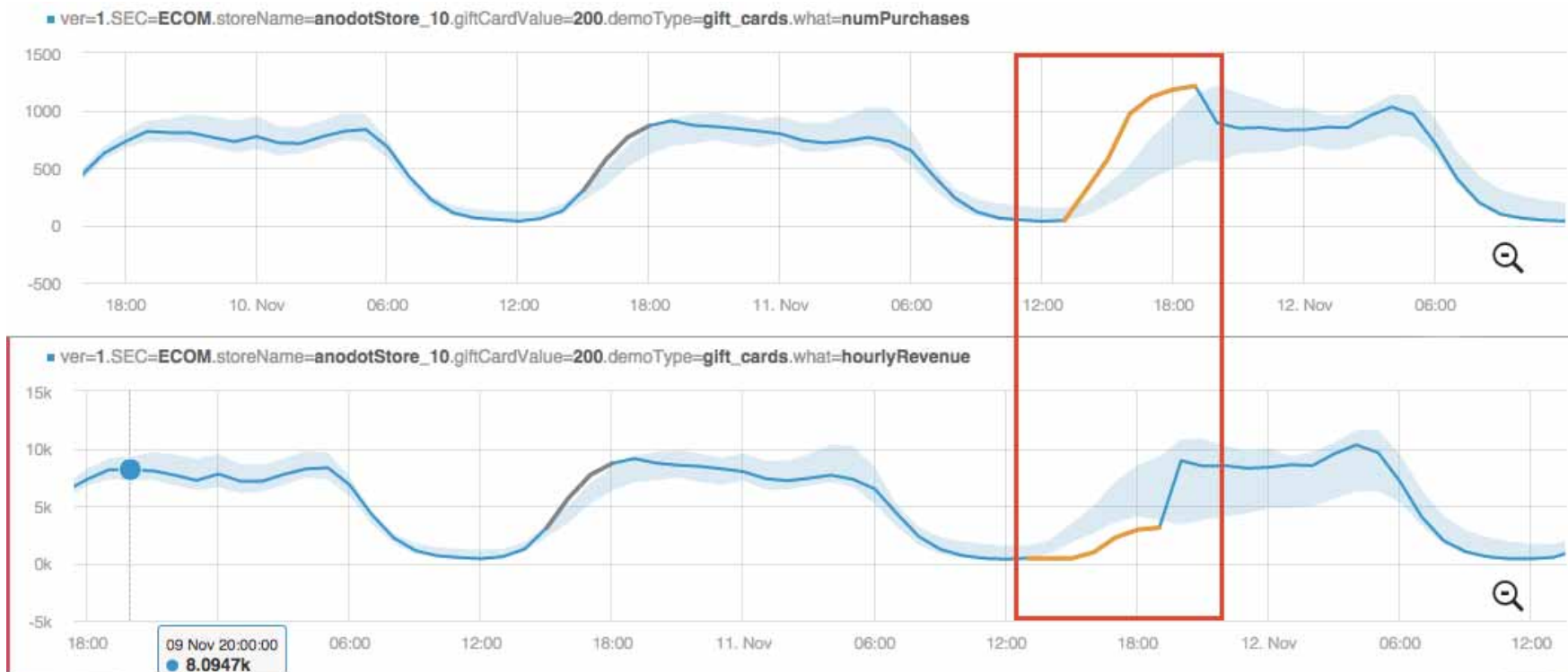
Static Thresholds versus Anomaly Based Alert

Anomaly Based Alert will find the problems hours before the static based one



Behavioral Topology Learning and Correlation

Viewing correlated metrics in context enables correct problem identification

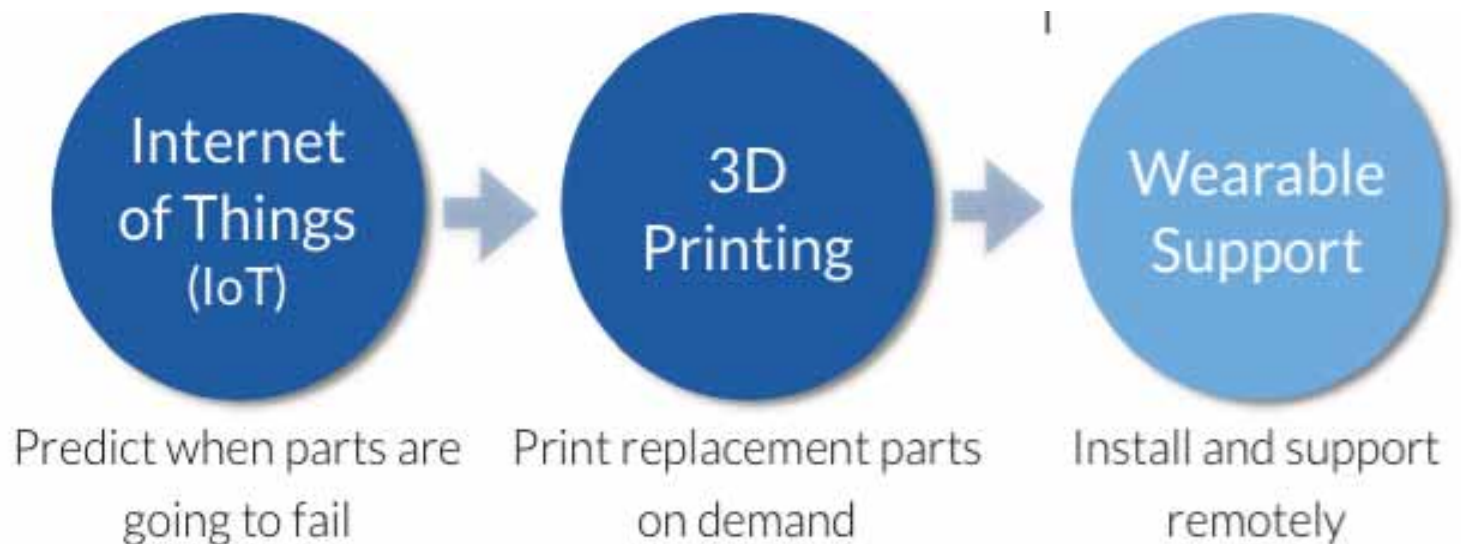




Predictive Maintenance and Service Optimization

Maintenance Services

Disruptive Technologies for Supply Chain Management

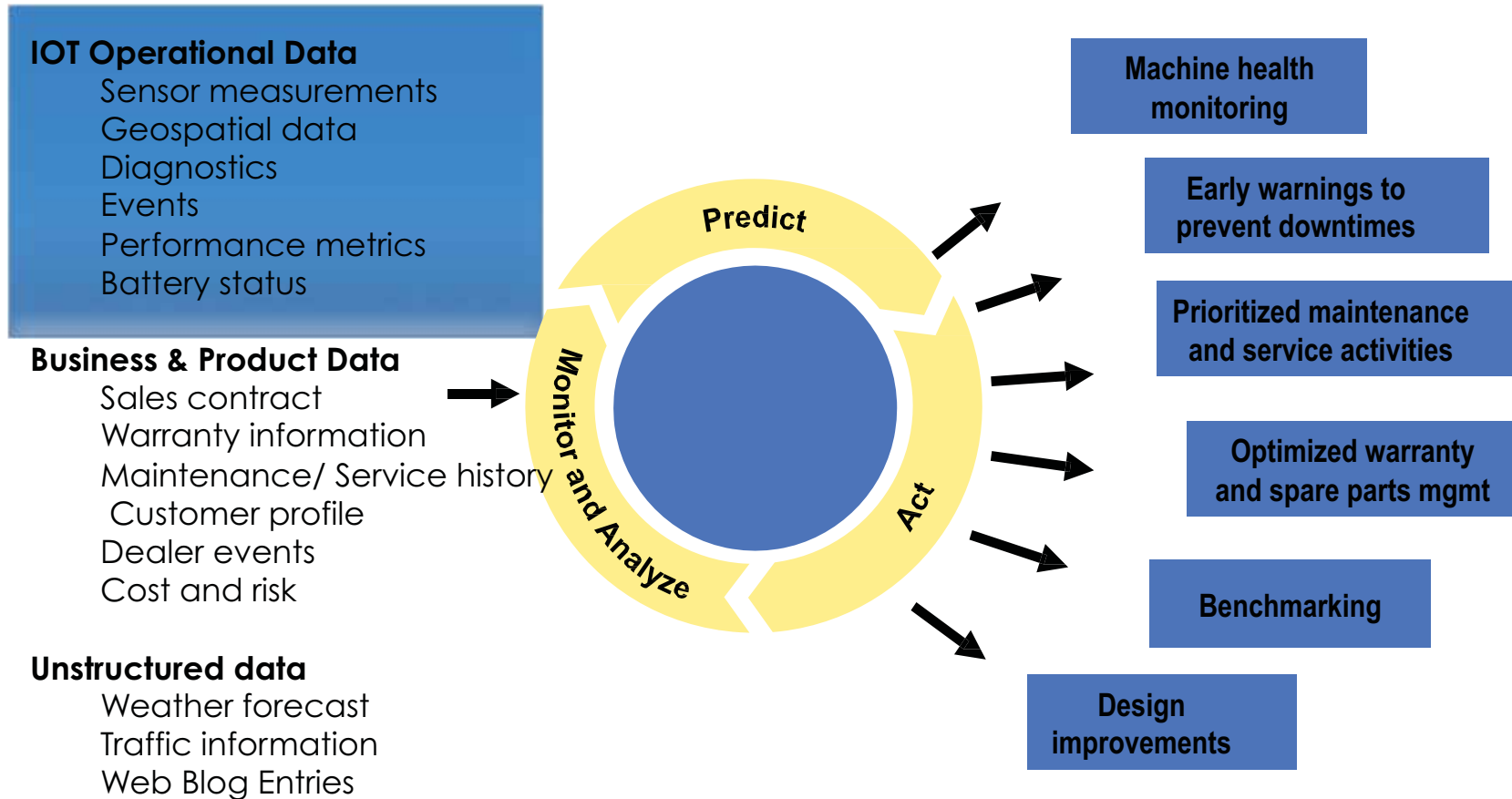


Market Size

- World's GDP in 2014 is expected to reach \$74 trillion, but the value of all assets is much higher.
- Maintenance spend alone is estimated at \$447 billion.

Managing assets efficiently makes a difference!

Predictive Maintenance and Service



Use Case: Printers

- Adjust service intervals according real-life usage
- Improve reliability with predictions derived from actual usage conditions
- Reduce inventory
- Significant reduction in cost per service event
- Customer self service with utilization of the HUD, wearables and new automated workflows and communications capabilities
- Production: use data to further improve quality



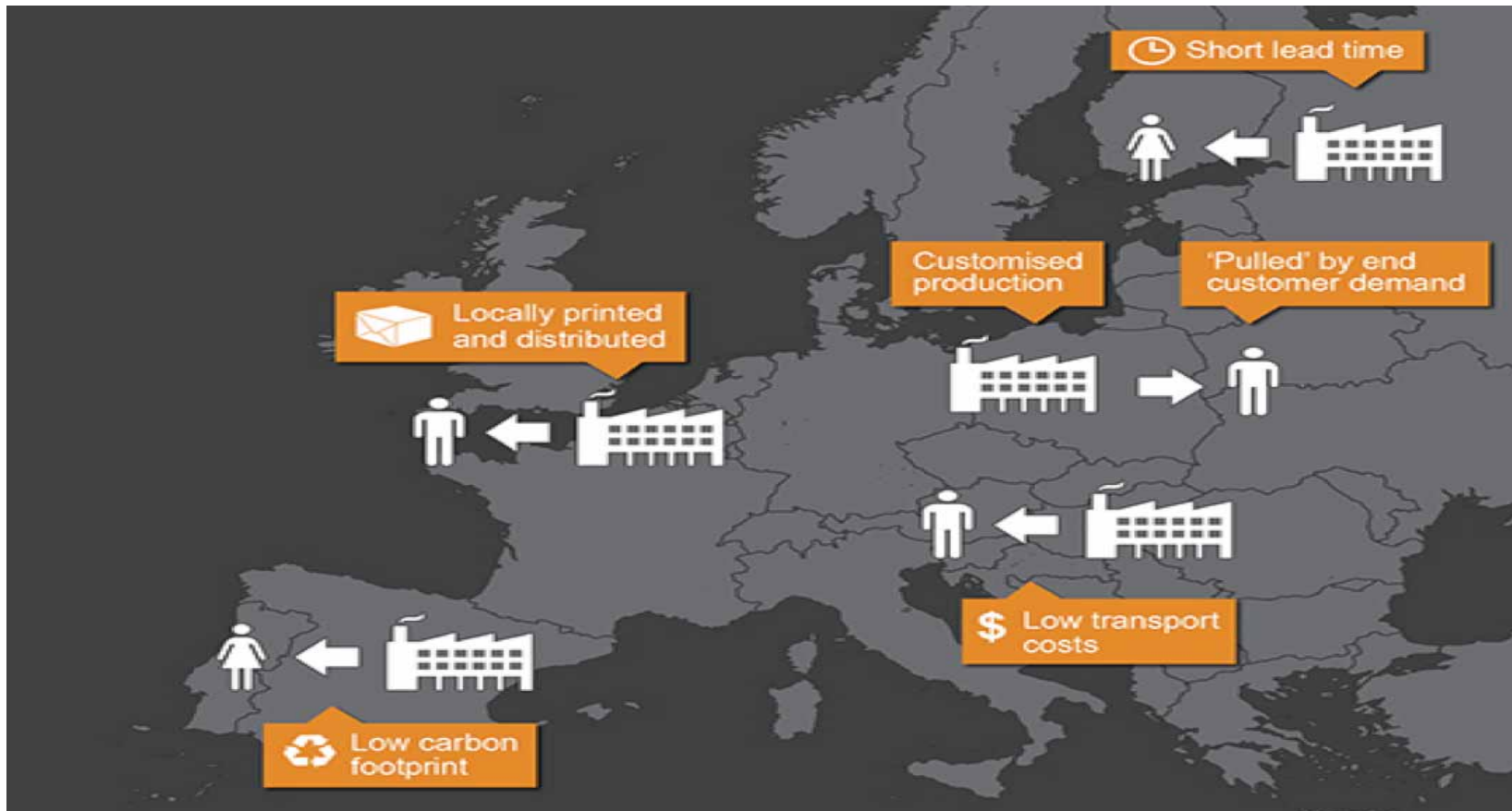
SMART Maintenance thru Logistics Optimization, Inventory Reductions and 3D Printing of Parts

Major Disruptor in Global Supply Chain and Next
Multi-Billion Dollar Opportunity

Traditional Supply Chain



3DP Supply Chain



Flexible and Smart Manufacturing

The real potential is to transform the way we manufacture by disrupting the age-old supply chain and replacing it with something entirely new: a globally connected, local supply chain.

- Manufacturers are using 3-D printing at their facility, reducing stock levels and warehousing space.
- Some vendors are installing 3-D printers at their customers' facilities, providing the software designs for products and parts to be manufactured as needed.

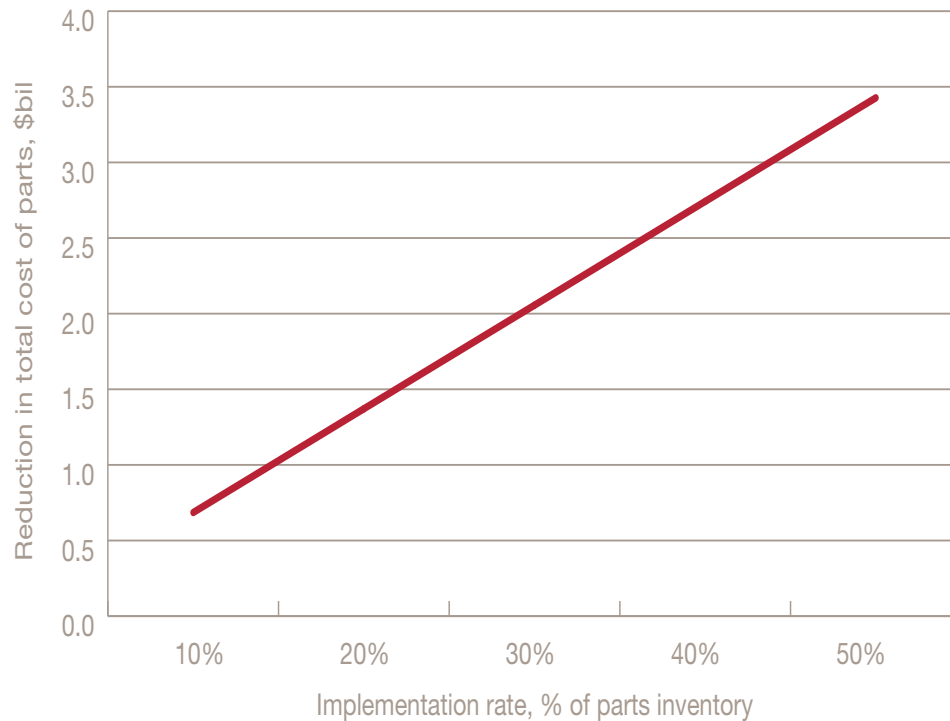
Market Sizing

The Wohler report estimates that the 3-D printing industry will be a \$5.2 billion market in the next 5 - 10 years

3D Printing and Supply Chain

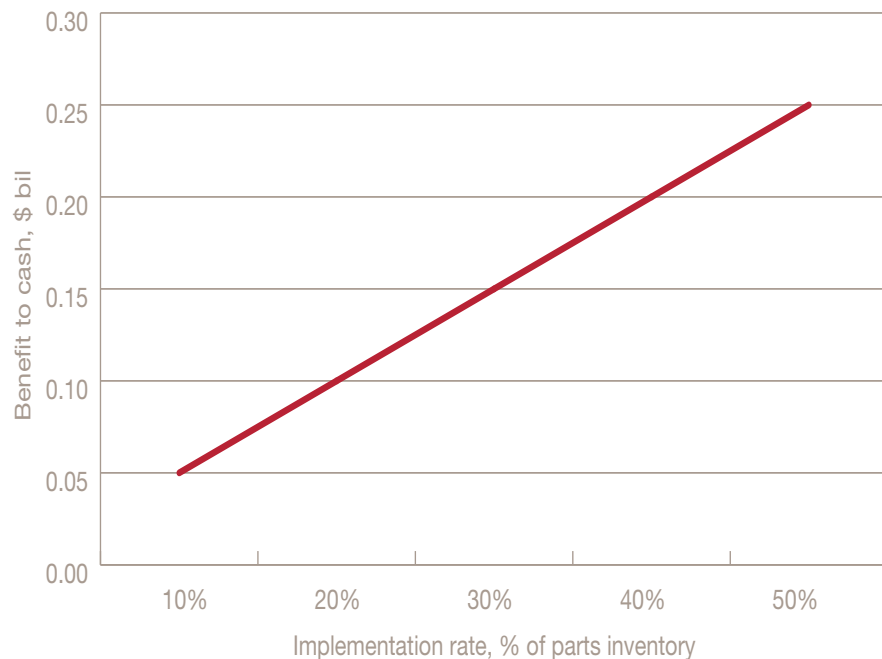
- The influence on inventory and logistics is that you can "print on demand," meaning that you don't have to have the finished product packed on shelves or stacked in warehouses any longer. This reduces the cost of distribution from component to final assembly, while reducing scrap and improving assembly cycle times.
- The traditional supply chain model is founded on established constraints of the industry, which are the efficiencies of mass production, the need for low-cost, high-volume assembly workers, real estate to house each stage of the process and so on. 3-D manufacturing eliminates those constraints.
- 3-D printing abolishes the need for high volume production facilities and low level assembly workers, thereby cutting out at least half of the supply chain in a single blow. It is no longer efficient to ship products across the globe to get to the customer when manufacturing can take place almost anywhere at the same cost.
- This not only affects the manufacturing facility, but the distribution warehouse and trucking. With the spotlight on driving down costs and increasing consumer acceptance, 3-D printing's role is showing up in innovative supply chains and these advances are opening up new opportunities.

Use Case Aerospace: \$3.4 billion in MRO savings



A global aerospace MRO costs could be reduced by up to \$3.4 billion, assuming that 50% of parts are printed. Even if 15% of aerospace replacement parts could be printed, we could expect over \$1 billion

Use Case Airline: \$1.8B in incremental pre-tax profit



- Assuming that half of MRO materials are 3D printed, the global airline industry could realize about \$1.8 billion in additional pre-tax profits annually as a result of the printing technology savings.
- Incremental pre-tax profits could top \$1 billion for the global industry, even at a more conservative 3DP penetration rate.
- A third analysis suggests that the airline industry could benefit from 3D printing through lower global airline industry inventory costs. This analysis estimates additional liquidity of between \$50 million and \$250 million for the industry, depending on 3DP penetration rate.