




# Innovation Insights

## *Digital Transformation in Transportation*

Steve Appleby

March 2016

The background features several thin, light blue lines that intersect to form various geometric shapes, including triangles and quadrilaterals, creating a modern, abstract design.

Innovation, in the hands of people  
with experience, vision and a  
passion for what they do, can  
improve lives and transform  
communities.

Four of today's top 10 incumbents (in terms of market share) in each industry will be displaced by digital disruption in the next five years.

The stakes are high.

Internet of Things

Asset Sensor Network & Telemetry

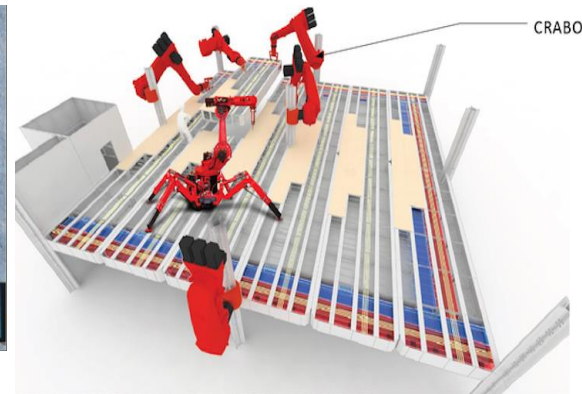
Additive Manufacture & Industrial 3D Printing

Manufacture & Logistics 4.0

Cyber Security

Outcome & Performance Based

Data driven Design



FTING ASSEMBLY AND MAINTENANCE DEVICES

Advanced Materials & Nanotechnology

Big, Open and Cognitive Data

Autonomous Plant & Robotics

Cloud Computing / (Serious) Gamification & Simulation of business models

Self procuring  
Self Refining Performance  
Real-time (POE)

Lightning speed  
Decision Making

# Constructs of Construction Industry 4.0

The background is a solid blue color with several thin white lines that intersect to form a geometric pattern of triangles and quadrilaterals, primarily on the right side of the image.

# Enterprise-wide Innovation

## *Transforming the Digital Enterprise*

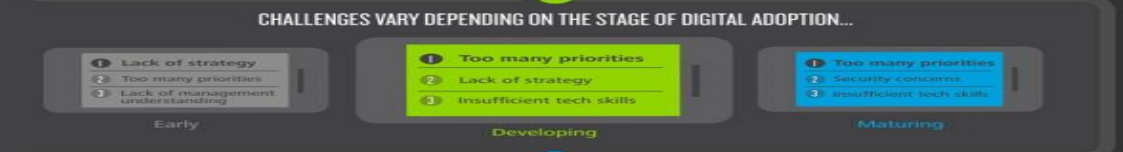
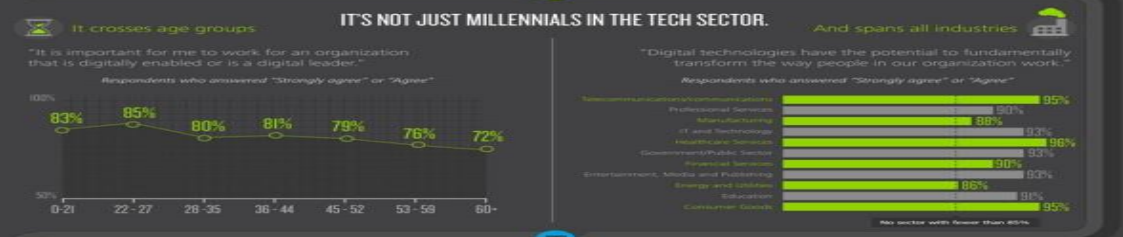
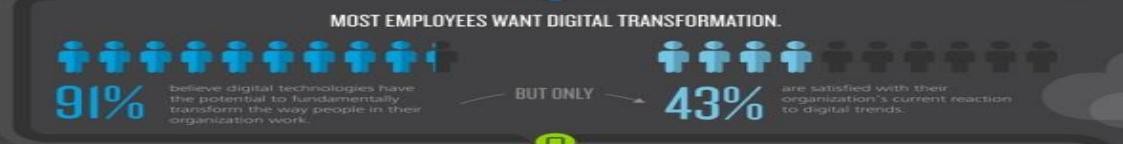
## Innovation in Business:

- Trying new things and grasping opportunities when they arise
- Managing risk intelligently
- Considering new ideas wherever they come from but choosing well between good and bad ideas
- Looking inwards and outwards for inspiration and collaboration
- Having employees that regularly ask “why don’t we...”
- Giving time to developing new ways of doing things
- Accepting that sometimes **success begins with failure**

# TRANSFORMING THE DIGITAL ENTERPRISE

WHAT DOES A DIGITALLY TRANSFORMED BUSINESS LOOK LIKE?  
It's an organization, reimagined through digital that is:

- Improving processes
- Engaging talent, organization-wide
- Driving new business models



TO READ THE FULL REPORT, VISIT [SLOANREVIEW.MIT.EDU/DIGITAL2015](http://SLOANREVIEW.MIT.EDU/DIGITAL2015).  
To understand the challenges and opportunities associated with the use of social and digital business, MIT Sloan Management Review, in collaboration with Deloitte, conducted a fourth annual survey of more than 4,200 business executives, managers, and analysts from organizations around the world.

MIT Sloan Management Review | Deloitte Digital

- Improving processes
- Engaging talent, organisation-wide
- Driving new business models

# The Era of SMAC.....

**S**

social



**M**

mobile



**A**

analytics



**C**

cloud





# Digital Disruption

- **Uber**, the world's largest taxi company, owns no vehicles
- **Facebook**, the world's most popular media owner, creates no content
- **Alibaba**, the most valuable retailer, has no inventory
- **Airbnb**, the world's largest accommodation provider, owns no real estate

The background is a solid blue color with several thin white lines crossing each other in a geometric pattern, primarily on the right side of the image.

# Industry-wide Innovation Digital Transformation in Transportation

# Internet of Things

“The Internet of Things (IoT) is the network of physical objects—devices, vehicles, buildings and other items embedded with electronics, software, sensors, and network connectivity—that enables these objects to collect and exchange data.”

“The Internet of Things allows objects to be sensed and controlled remotely across existing network infrastructure, creating opportunities for more direct integration of the physical world into computer-based systems, and resulting in improved efficiency, accuracy and economic benefit.”

# Internet of Things



# Aegean Motorway

Aegean leveraged the Internet of Everything to help them connect devices across hundreds of kilometers of roadway.

- **Established infrastructure** to reduce traffic congestion
- **Reduced TCO** through converged network
- **Connected 5000 devices** for unified and central management

“Most drivers will never notice our IT investment, but our ability to divert traffic, make announcements, or route emergency crews efficiently can save lives.”

*Charalampos Kiorpelidis Systems and IT  
Manager  
Aegean Motorway*



# Linz AG

The Austrian company transformed public transit by embracing the Internet of Everything.

- **Increased** tram **efficiency** and performance while **reducing energy consumption by 10 percent**
- **Reduced** carbon dioxide output by **85 tons** in just 9 months
- **Simplified** maintenance on ticketing machines
- **Enhanced** capacity management



“People regard the Internet of Everything as a certainty and are excited about it. Our leaders are actively involved in seeking new insights and innovation for the city of Linz, and the Internet of Everything is integral to their vision. It will change society.”

*Michael Langerreiter*  
*Project Manager*  
*LINZ AG 075*



# Alaska Dept. of Transportation

The intrepid Alaska DOT embraced the Internet of Everything to help them connect in extreme circumstances.

- **Responded quickly** to emergency situations
- Expanded communications and connected roadside network to **broaden** reach and **improve** responsiveness
- Ensured **efficiency** across equipment and maintenance

“We could quickly dispatch vital equipment and people and communicate no matter where I was. The impact of this system has been amazing.”

*Jeff Russell*

*Dalton Area Superintendent*

*Alaska Department of Transportation*



# Austria's autobahn corporation (ASFiNAG)

Data is at the heart of ASFiNAG's digitization. The Internet of Everything is keeping roads safe and drivers happy.

- **Reduced** need for investment through better road-use
- **Connected** roads, drivers and authorities nationwide
- **Exceeded** EU standards for road transport



“We connected more than 70,000 sensors and 6,500 traffic cameras ... to help route emergency vehicles and provide drivers with up-to-date information.”

*Bernd Datler*  
*Managing Director*  
*ASFINAG tolling company*



# Smart Cities | City as a Platform

## Urbanization creating massive and rapid pressure on mass transit systems

- 80% of the world's population will be living in cities by 2050.

## A growing urban middle class also creates challenges.

- Increasingly sophisticated, and web-connected consumers demand a better customer experience in mobility.

## Proliferation of sensors

- Smartphones not only create the opportunity to provide services to users, but they are also sensors in their own right and hence rich sources of data.
- Sensors are being installed in city to get a more precise vision of its “context”

## The need for new business model

- Just as contextual mobility creates the opportunity for a better passenger experience and faster passenger flow, it also creates the opportunity for transport service providers to market additional services

# Smart Cities based on data...



# Your Groceries Could Meet You When You Step Off the Train

A pilot collaboration between the D.C. Metro and Peapod places pickup "pods" in three stations.

EILLIE ANZILOTTI | [@eillieanzi](#) | Mar 4, 2016 | [Comments](#)

185  
Shares

[Share on Facebook](#)

[Tweet](#)



The online grocer Peapod launches grocery pick-up locations at three D.C.-area Metro stations.

# Augmented reality has arrived in Palm Springs and Fort Lauderdale. Why you should be next

Thu, 2016-01-14 14:18 -- SCC Partner

 SHARE



*By Gregory G. Curtin, Ph.D*





BA Advert



So Elon Musk's Hyperloop Is Actually Getting Kinda Serious

# SO ELON MUSK'S HYPERLOOP IS ACTUALLY GETTING KINDA SERIOUS



though, it

August 31st, 2015 by [Marc Howe](#)

Originally published on [Gas2](#).

Engineering firm AECOM will lend its services to the realization of Elon Musk's dream of an



## **Eagles May Be The Next Weapon Against Drones (SEE IT)**

Feb 01, 2016 10:38 PM EST

Dutch police are aligning themselves with an bird training organization to help them train eagles to disarm aerial drones.



## **Drones Banned By Ski Federation After Austrian Skier Barely Avoids Injury (SEE IT)**

Dec 23, 2015 10:36 AM EST

The international ski federation has determined that it will ban all drones as a result of what was almost a devastating collision this week at a competition in Italy.

# Time To Disrupt Digitally!

23 **This month's big issue:  
Delivering Differently**



We are in the midst of a global digital revolution which is transforming the way in which people and businesses connect. It is also transforming the potential for businesses to innovate and improve their productivity. Is 2016 the year of delivering differently?

# Opportunity

Realise real value from our digital assets

**Data  
Driven,  
Hyper  
Connected,  
Digital  
Railways**



**MAYOR AND TFL UNVEIL DESIGN FOR  
NEW CROSSRAIL TRAINS**  
**AIR-CONDITIONED WALK-THROUGH CARRIAGES, WITH  
CAPACITY FOR 1,500 CUSTOMERS, WI-FI AND 4G**



Thank You

[Steve.Appleby@aecom.com](mailto:Steve.Appleby@aecom.com)

**AECOM**