



**The Road
to Trust**

Truck|io

**Supply Chain
Innovation in 2020
and Beyond**

About Chris

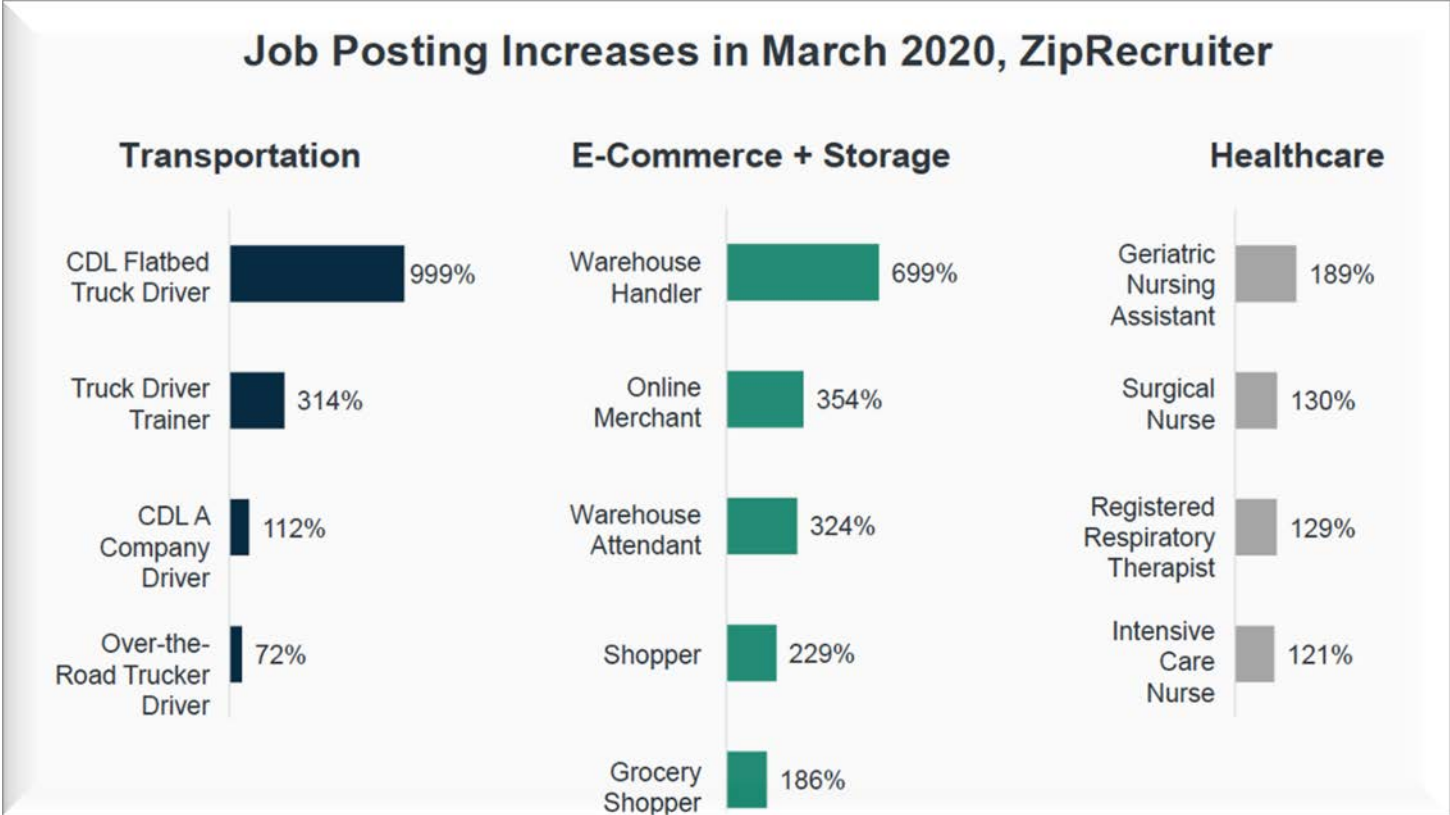
Founder & CEO of Truckl



- Supply Chain Technologist
- Private Equity Turnarounds
- Edgeware, GPS, RFID and IoT
- Several start-ups (\$45M venture funding)
- Stints in cyber security and cryptography
- 75+ software implementations on three continents
- 5 awarded patents on edge computing, IoT and GPS, several more pending
- 14+ years of teaching at UNT (Supply Chain Strategy, ERP, SCM), 7+ Years at University of Dallas (Strategic Management, Supply Chain Strategy)



Just Food for thought ...



Source: ZipRecruiter & BOND, 2020

Supply chain professionals were in far greater demand than nurses at the outset of the COVID pandemic

Part 1

A Couple of Thoughts

Part 2

Major Trends in Supply Chain

New Markets

Everything Real-time

Dazzling Possibilities

New Friends

Brave New World

Part 3

How Can *You* Deal With All of This?



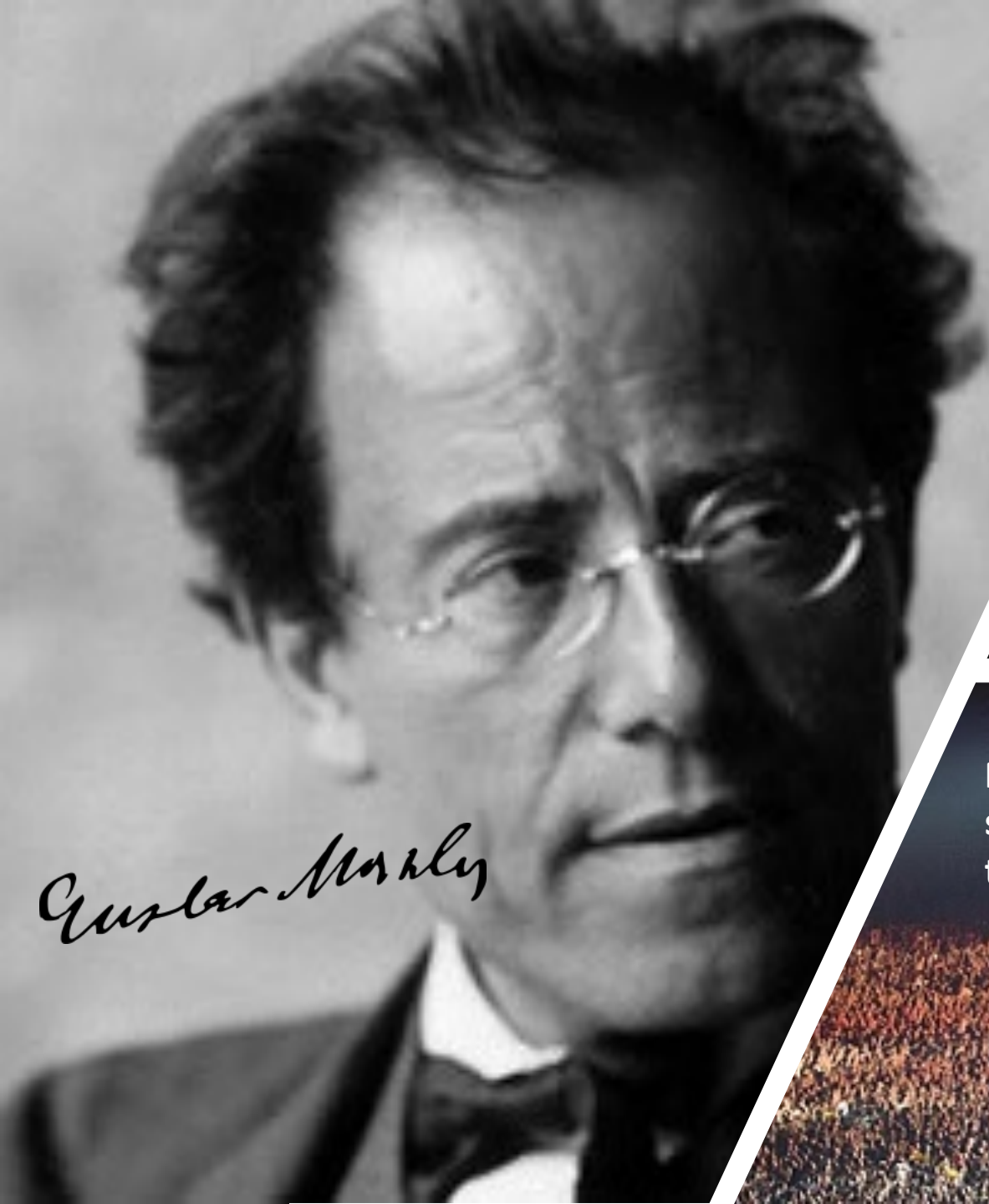
“The Americans have need of the telephone, but we do not. We have plenty of messenger boys.”

Sir William Henry Preece (1834 - 1913), Chief Engineer to the British Post Office.



The Question Is Not How It Starts, But *What Comes Of It.*

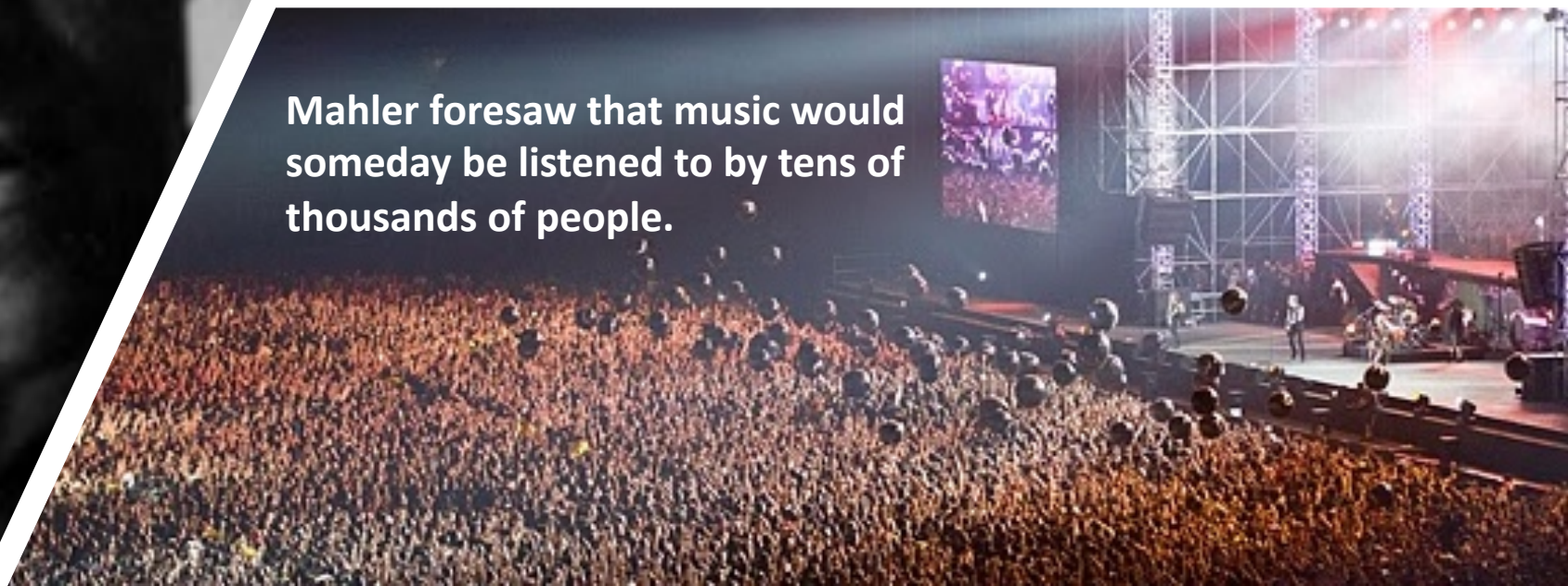
Think Big, Start Small, Move Fast!




Gustav Mahler



Mahler foresaw that music would someday be listened to by tens of thousands of people.





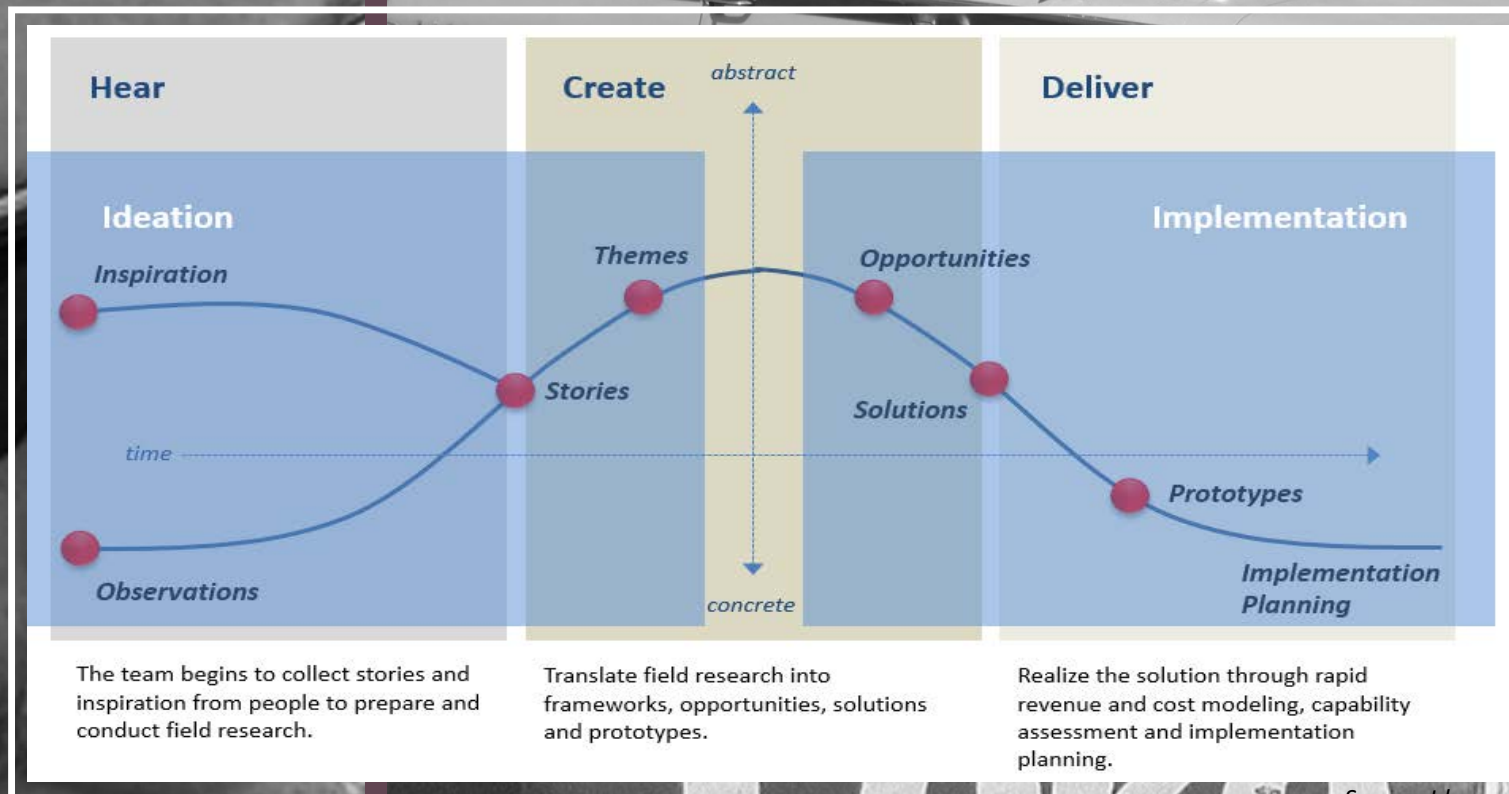
“**Innovation** is the market introduction of a technical or organizational novelty, not just its invention.”

“Creative **Destruction**”

“No innovation, no **entrepreneurs.**”

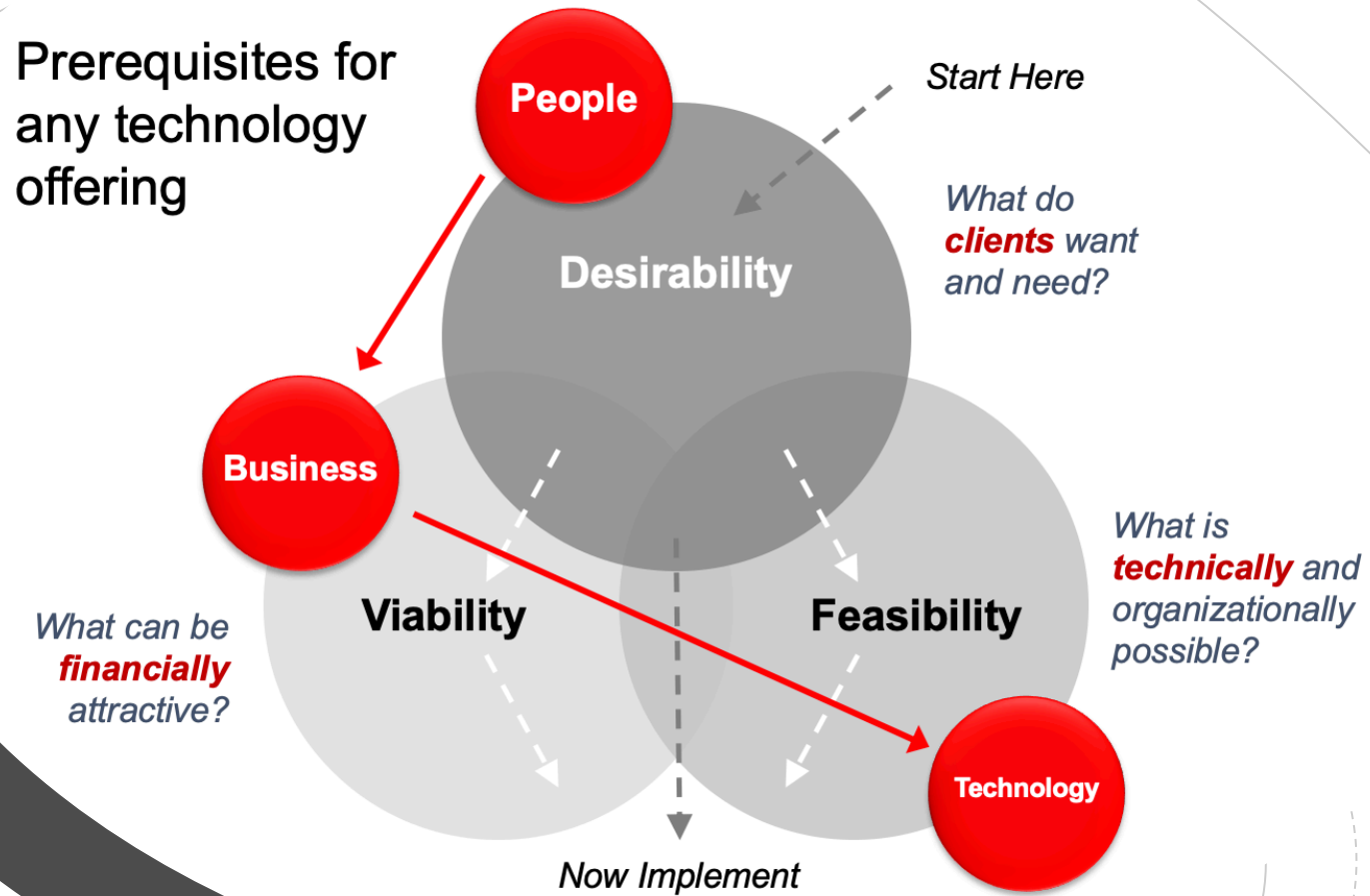
“Firms must constantly **keep on their feet**, on ground that is slipping away from under them.”

Joseph Alois Schumpeter



Source: Ideo

What Makes Innovation Work



Source: Ideo

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**GOOGLE EFFECT: EVERYONE IS SKILLED
IN FINDING THE FACTS**

A close-up photograph of a chef in a white uniform holding a large, cooked king crab. The crab is dark brown and appears to be steamed or boiled. The chef's hands are visible, holding the crab from behind. The background is slightly blurred, showing the chef's uniform and a dark surface.


Product
authenticity
will grow in
importance

King Crab Fisheries provides a
product traceability portal for
its restaurant customers



Smarter use of consumer and market data through AI

Ikea uses AI to maximize returns profitability

The background image shows the interior of an Amazon Go store. It features aisles of shelves stocked with various food items, including bags of snacks and boxes of instant noodles. A prominent sign above the shelves reads "MEALS MADE EASY" in green. Below that, another sign lists "SUSHI • PASTA • PIZZA SALAD • SIDES". In the foreground, several metal shopping carts are visible, some with the Amazon logo. A sign on a counter in the middle ground says "Grab a cart. Bag as you shop." The overall lighting is bright and modern.

Convenience trumps other factors and sets expectations

Grab a cart. Bag as you shop.

Amazon Go store in Seattle opens to public



Exciting new experiences may fade, but cost-cuts could stick

Creator offers burgers made by a robotic cook



Micro plants, warehouses and popup stores

Reef offers containers as mobile
kitchens – it owns a lot of parking lots





Amazon understands the importance of last mile

If you own the last mile, you de facto own the customer



Supply chain flexibility is the new gold

DHL created a pop-up warehouse in 48 hours

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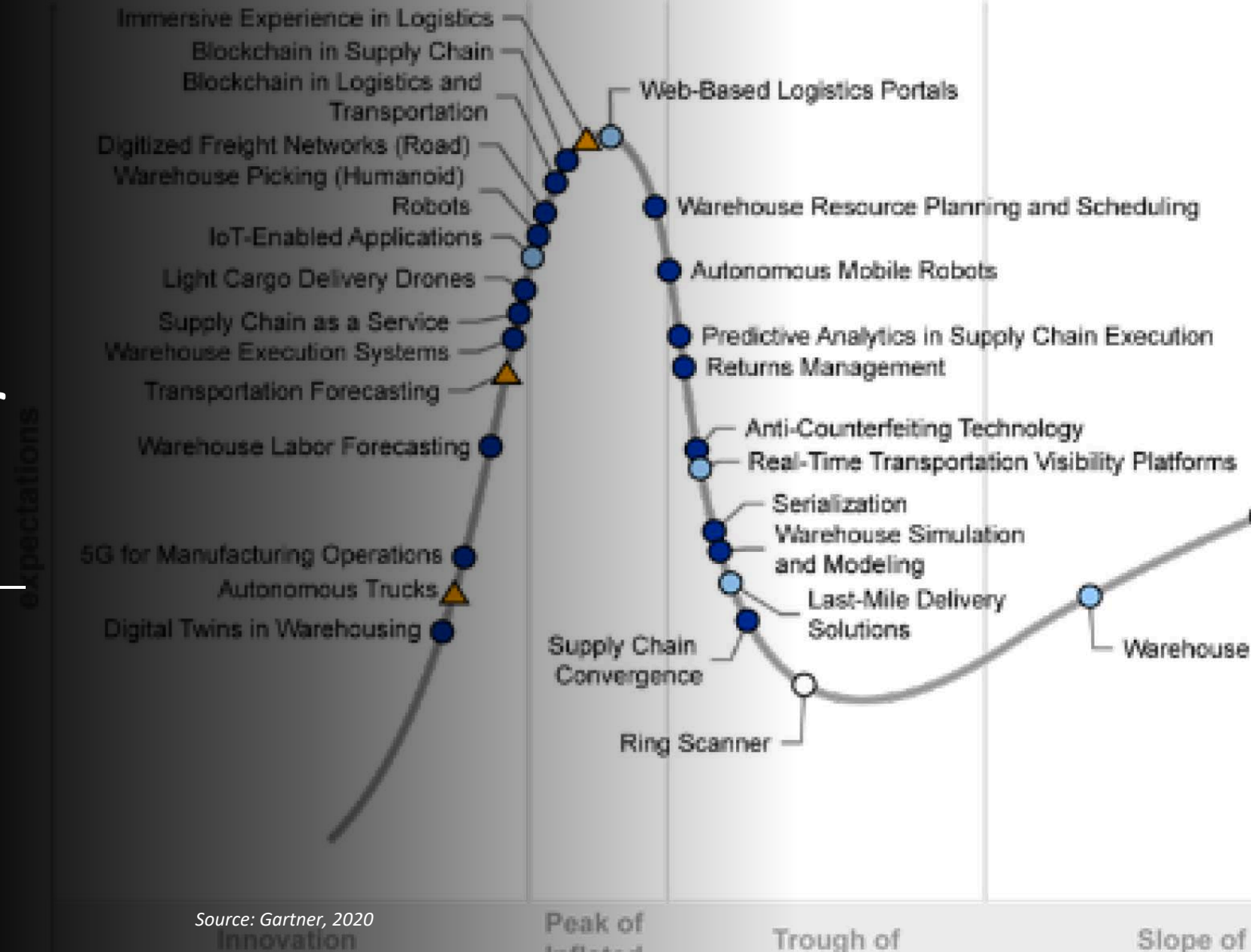
Brave New World

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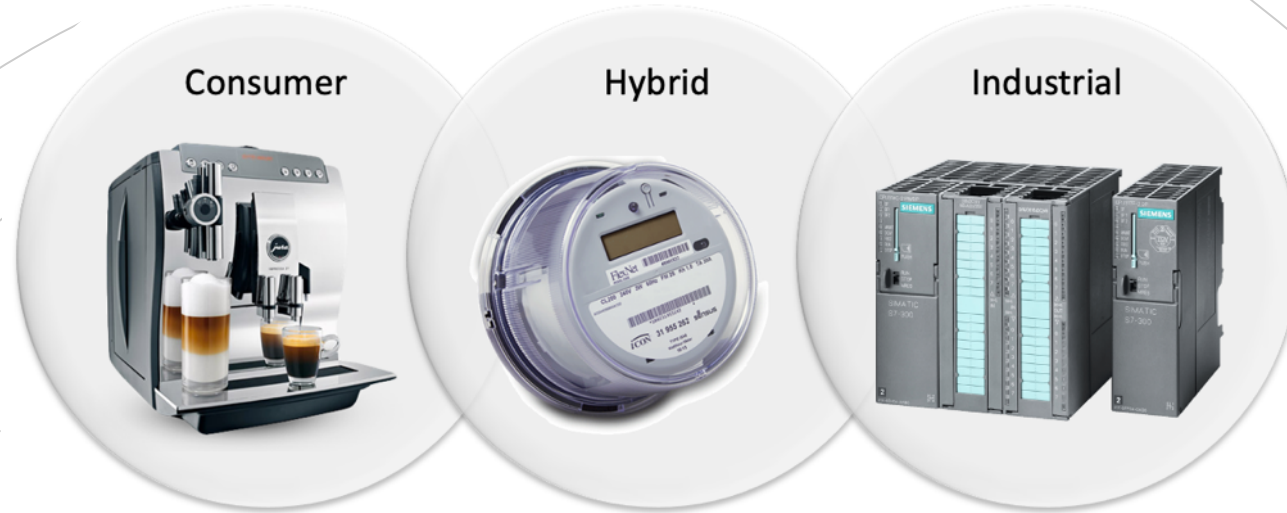
How Can *You* Deal With All of This?

Hype Cycle for Supply Chain Execution Technology

Supply chains need to process information increasingly faster ... at the edge!



Source: Gartner, 2020



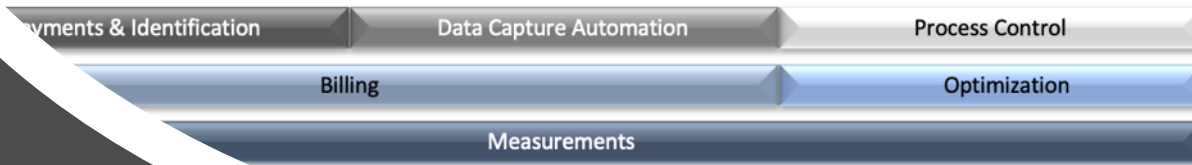
Shopping
Healthcare



Consumption
Mobility

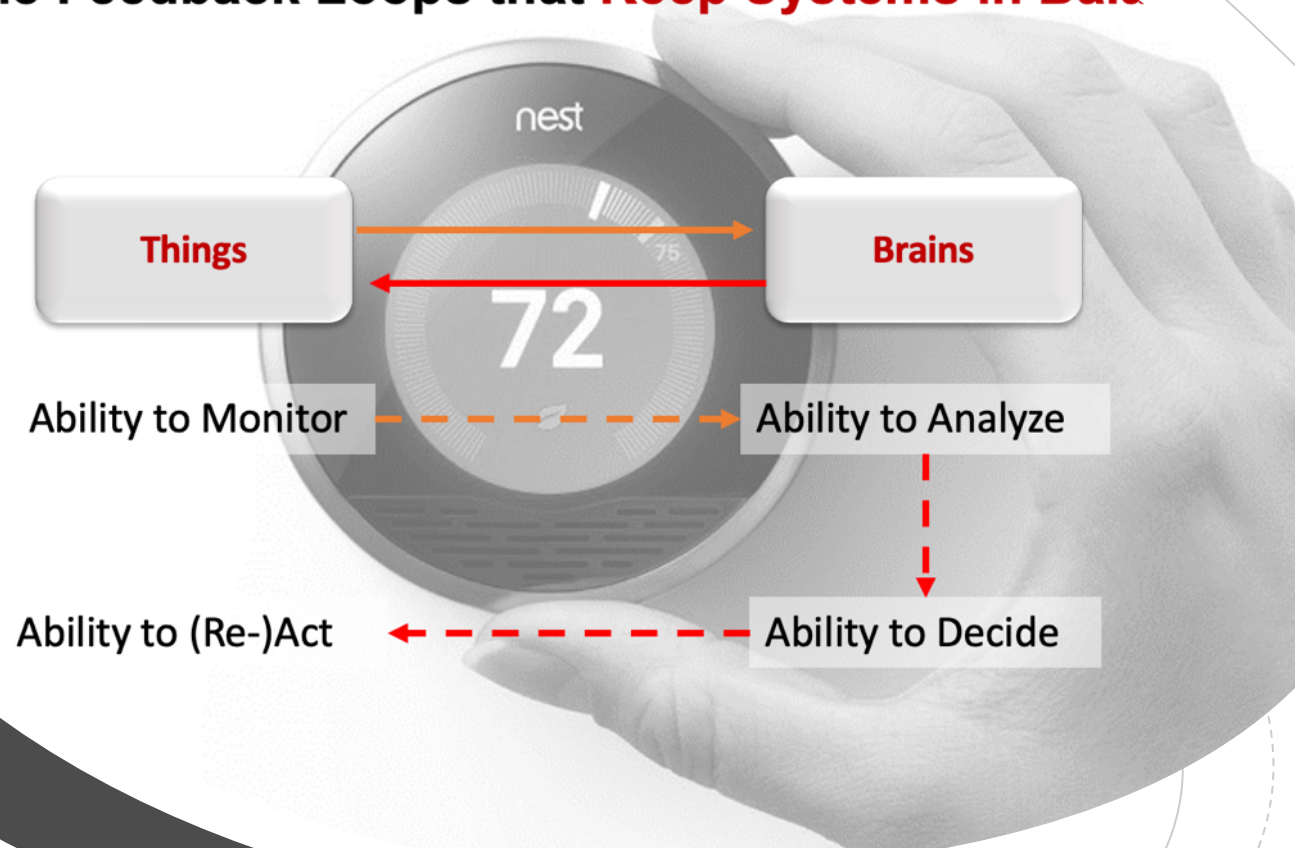


Flow Regulation
Early Warning



IoT is pervasive
and will continue
to grow (quietly)

Simple Feedback Loops that **Keep Systems in Balance**



IoT enables
self-organizing
systems



Sensors gradually permeate our lives


Toyota Woven City was designed for
sensors



Roadways are getting smarter and need to be ready for AV

Panasonic is enabling smart highways





Vehicles as platforms – think hardware and software

Daimler recognizes the new role of
trucks



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AR is the next
interface along
with voice

Apple's first AR glasses are about 2 years
away

Inventory counts, service and support, production lines, ...

Niantic already offers a platform for 3rd party apps





Collaborative AR
unlocks potential
for design and
optimization

Ubiquity6 makes the sharing of AR
experiences extremely easy



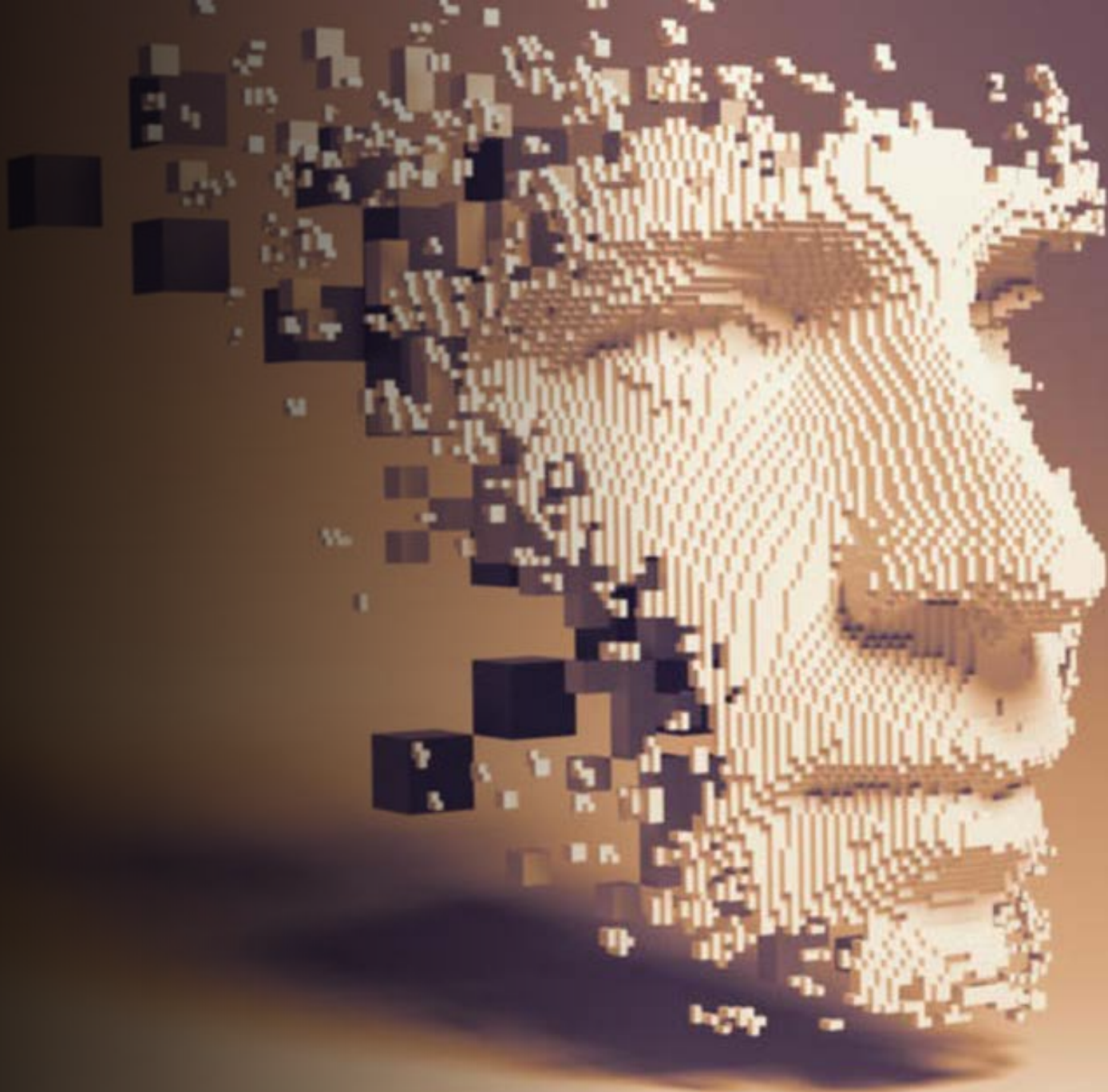
Real-time data
from the road
needs to be
actionable

**Embark just implemented real-time
diagnostics**



Expect machines to be increasingly “human”

Google DeepMind uses games to raise
its EQ






—

AI will
eventually be
available to
everyone

NeuraLogic enables regular PCs to run AI

A virtual news anchor, a woman with short dark hair, wearing a blue blazer over a white top. She is positioned in front of a futuristic, blue-toned background with digital patterns and lines. A microphone is visible in the foreground to her left.

**We might think
it's fake, but
our kids won't**

Xinhua uses virtual news anchors

An aerial, high-angle view of a multi-lane highway. The road is dark asphalt with white lane markings. A central median strip with greenery runs down the middle. Two cars are visible: a dark one on the left and a light one on the right, both blurred to indicate motion. The text is overlaid in white on the road surface.

Technologies such as blockchain have potential

Truckl designed a blockchain solution to reduce congestion, lower emissions and enhance safety on federal highways



—

Immutable
ledgers allow
you to prove
what you did

Air New Zealand anchors 3D printed
parts on-chain

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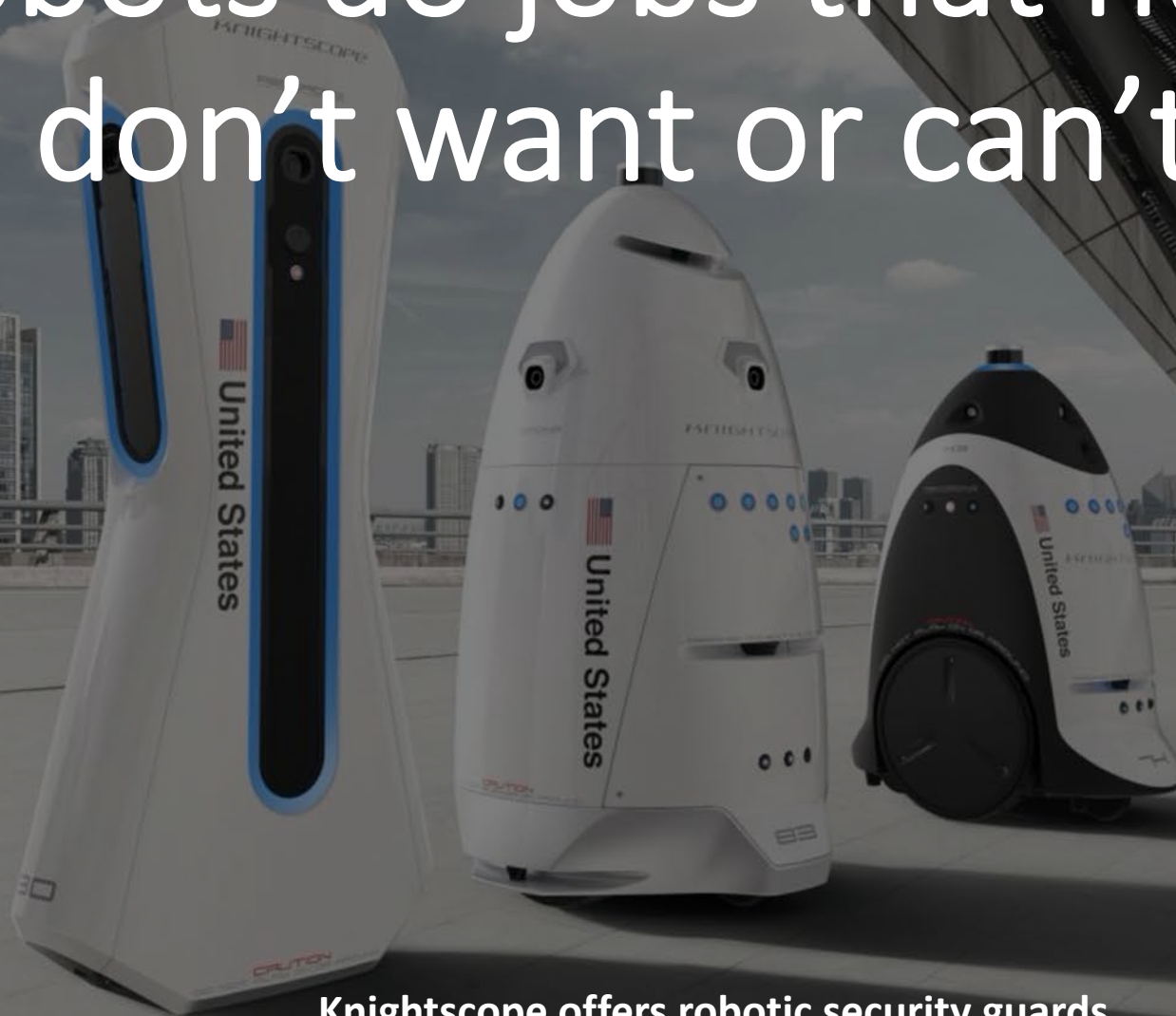


Brave New World


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Robots do jobs that humans
don't want or can't do



Knightscope offers robotic security guards

A Pepper robot stands in a queue of people, holding a tablet. To its left is a hand sanitizer dispenser labeled '消毒用' (Disinfection use). In the foreground, a row of white plastic containers is visible, with a sign on the first one that reads '食べ終わったお弁当の容器は、こちらに入れてください。' (After finishing eating, please put the bento container here). The robot is positioned in the middle of the queue, and a white robot base is visible to its right. The background shows a dark wall and a door.

Sometimes they are actually
better suited than we are

Pepper greeting robot used for social distancing

Virtual helpers will become
more commonplace as well

Samsung provides avatars that form memories

NEON


POWERED BY
CORE
RE

NEON

POWERED BY
CORE
RE

NEON

POWERED BY
CORE
RE

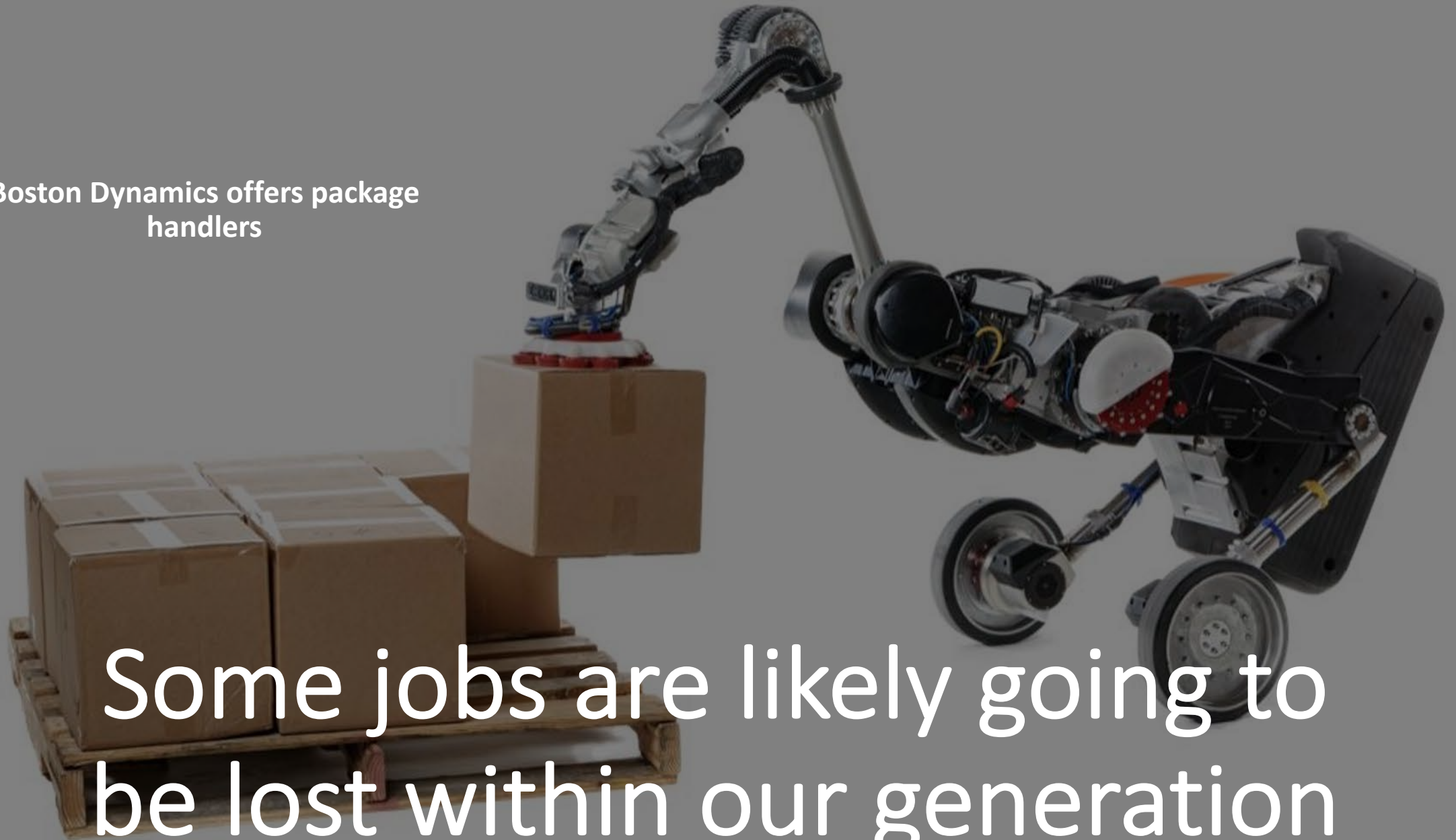


Avatars help in situations where humans would be overwhelmed


Tailspin programs avatars that train employees



Boston Dynamics offers package
handlers



Some jobs are likely going to
be lost within our generation



Automation is likely similar to the shift from ag to industry

Geek+ now competes with Amazon's Kiva



RaaS (lease-pay) will foster fast adoption

Locus eCommerce fulfillment robots

A worker in a blue uniform and exoskeleton is carrying a large cardboard box in a warehouse. The exoskeleton is black and green, with a purple air tank on the back. The worker is looking down at the box. In the background, another worker is also wearing an exoskeleton and working with a box on a blue pallet. The warehouse has high ceilings and industrial equipment.

Co-bots help where human intelligence and situational awareness is key

Strongarm manufactures exoskeletons
allowing workers to lift heavy loads



Drone deliveries face obstacles, but

...

Most sought-after job in China: drone pilot

Engineers will figure it out, if consumers want it

Amazon patent on packages that can be dropped from the air


Walmart started a pilot to deliver package by air this week





Volocopter works with DB Schenker on cargo

Cargo drones can fly 500 lbs.
already

A person wearing a white cleanroom suit and a hood is working on a Mars rover. The person is holding a long, thin rod or tool, possibly for maintenance or inspection. The rover is a complex piece of machinery with various components, including a large antenna and a camera. The scene is set in a dark environment, likely a cleanroom or a laboratory, with some lights illuminating the scene. The overall atmosphere is technical and focused.

We have self-driving cars already

NASA built a self-driving car for Mars



The last mile battle is far from over

Nuro rolled out pilots with Kroger & Walmart

AT have been
used in mines
and remote
locations

Einride is working with Lidl



First autonomous Grand Prix in 2021: 20 laps around
Indy in 25 minutes at an average speed of 185 mph



Part 1

A Couple of Thoughts

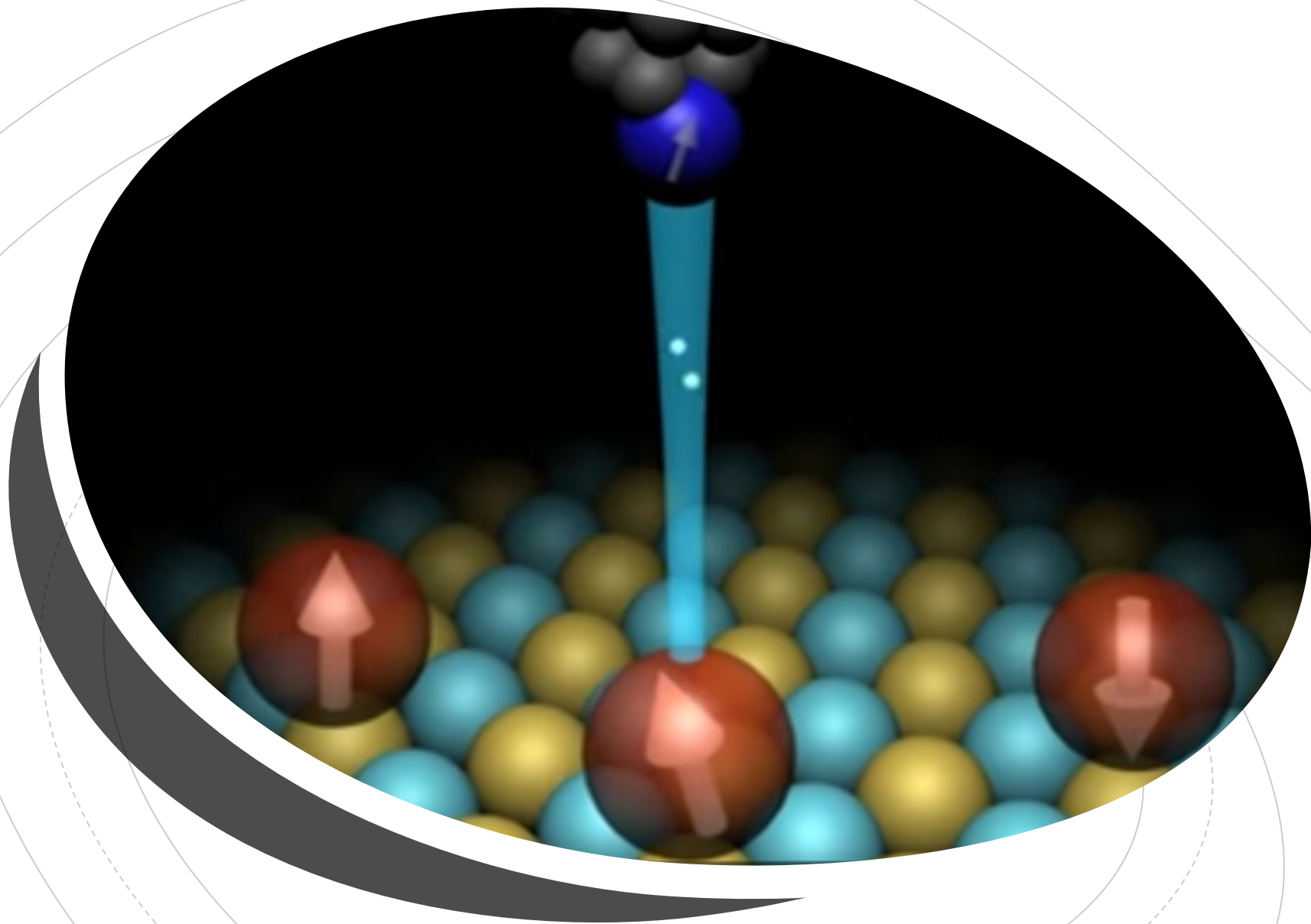
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Molecular
Storage

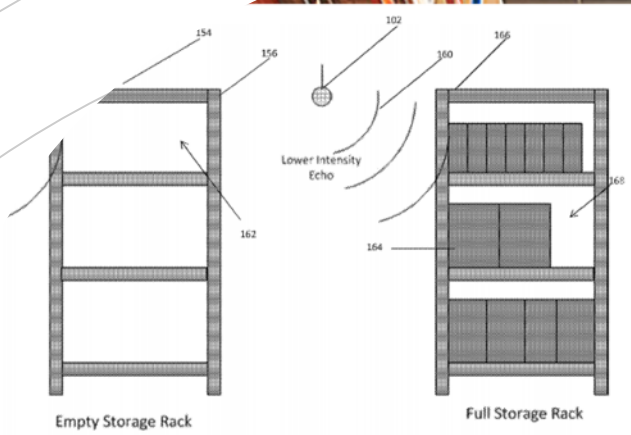


FIG. 1B



Inventory Sounds



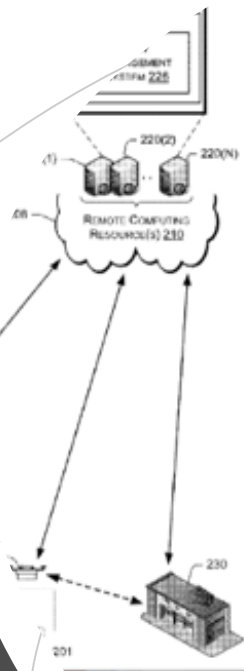
Quantum Computing



Boom Supersonic



AI as an Inventor



Hitchhiking Drones

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Supply chains ultimately must come together, and collaboration will be the new normal.

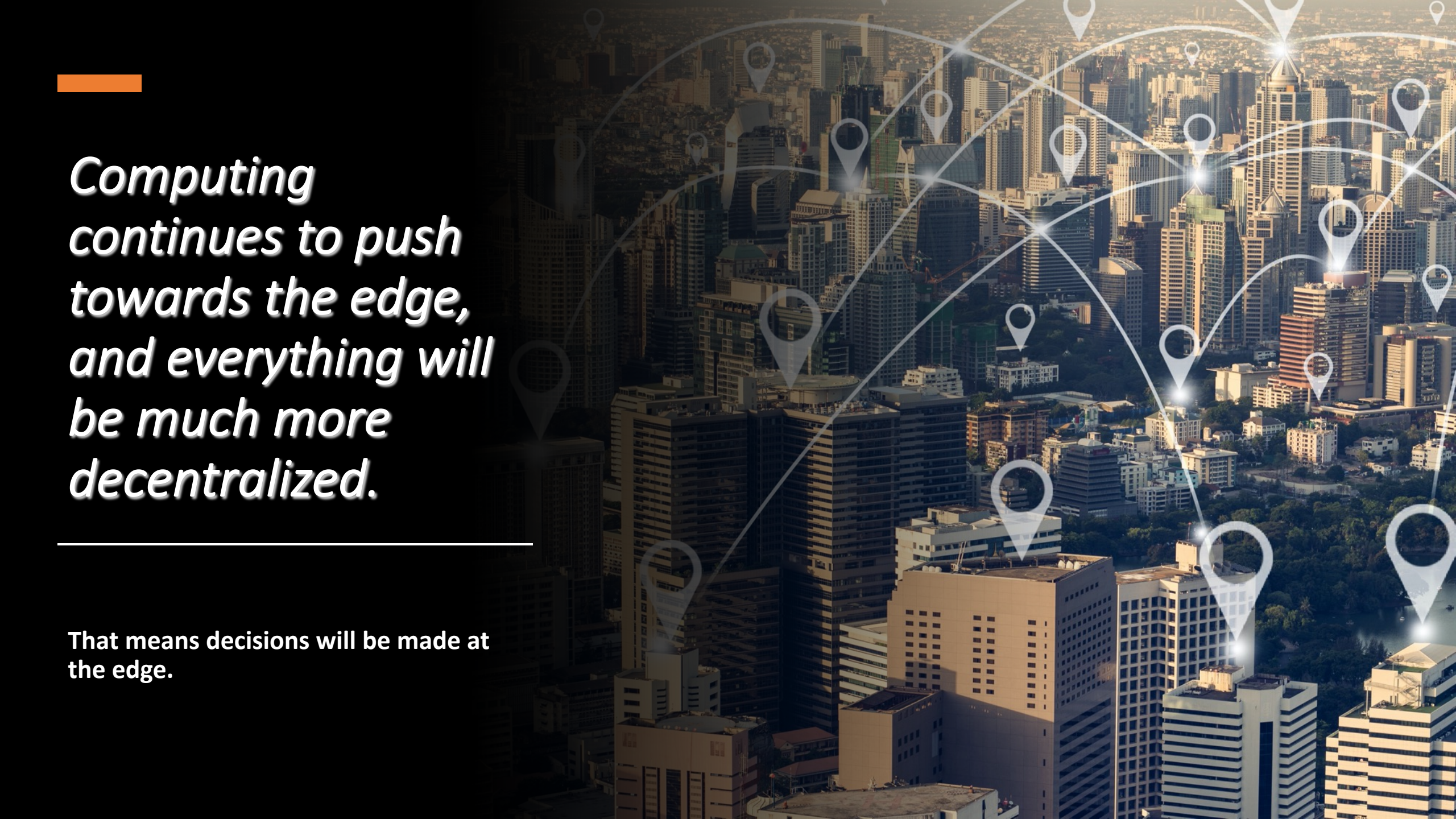
Optimization doesn't stop within your organization. It's just a matter of time.



A silver semi-truck with an orange trailer is parked in a lot. The truck is viewed from the side, showing the cab and the long trailer. The background is a dark, overcast sky. An orange horizontal bar is located at the top right of the image.

Autonomy and robotics will eventually become commonplace, and integrate across supply chain and manufacturing

Are we going to see fully robotic supply chains from farm to table?

The background of the slide is a high-angle photograph of a dense city skyline at sunset. The sky is a mix of orange, yellow, and blue. Overlaid on the city is a network diagram consisting of numerous white location pin icons connected by thin white lines, representing a distributed or edge computing network. The pins are scattered across the city, with some appearing to glow with a bright light. In the top-left corner, there is a solid orange horizontal bar.

Computing continues to push towards the edge, and everything will be much more decentralized.

That means decisions will be made at the edge.



Supply chain capacity, services and space will be automated, and can be traded like any other commodity.

Market places or stock exchanges for logistics and supply chain.



*The confluence of
many different
technologies
enables a Brave
New World.*

It's scary to think about some of these things, but ...

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“The key to winning is getting to where the puck is going to be next.”

“The Great One”



Not All
Innovation is
Equal - Identify
Pretenders
Early and Fast



OO + NT = EOO



*Adopting innovation
requires an open
mind and the
willingness to fail.
Don't ...*



Questions,
please!



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