



**The Road
to Trust**

Truck|io

**Supply Chain
Innovation in 2020
and Beyond**

About Chris

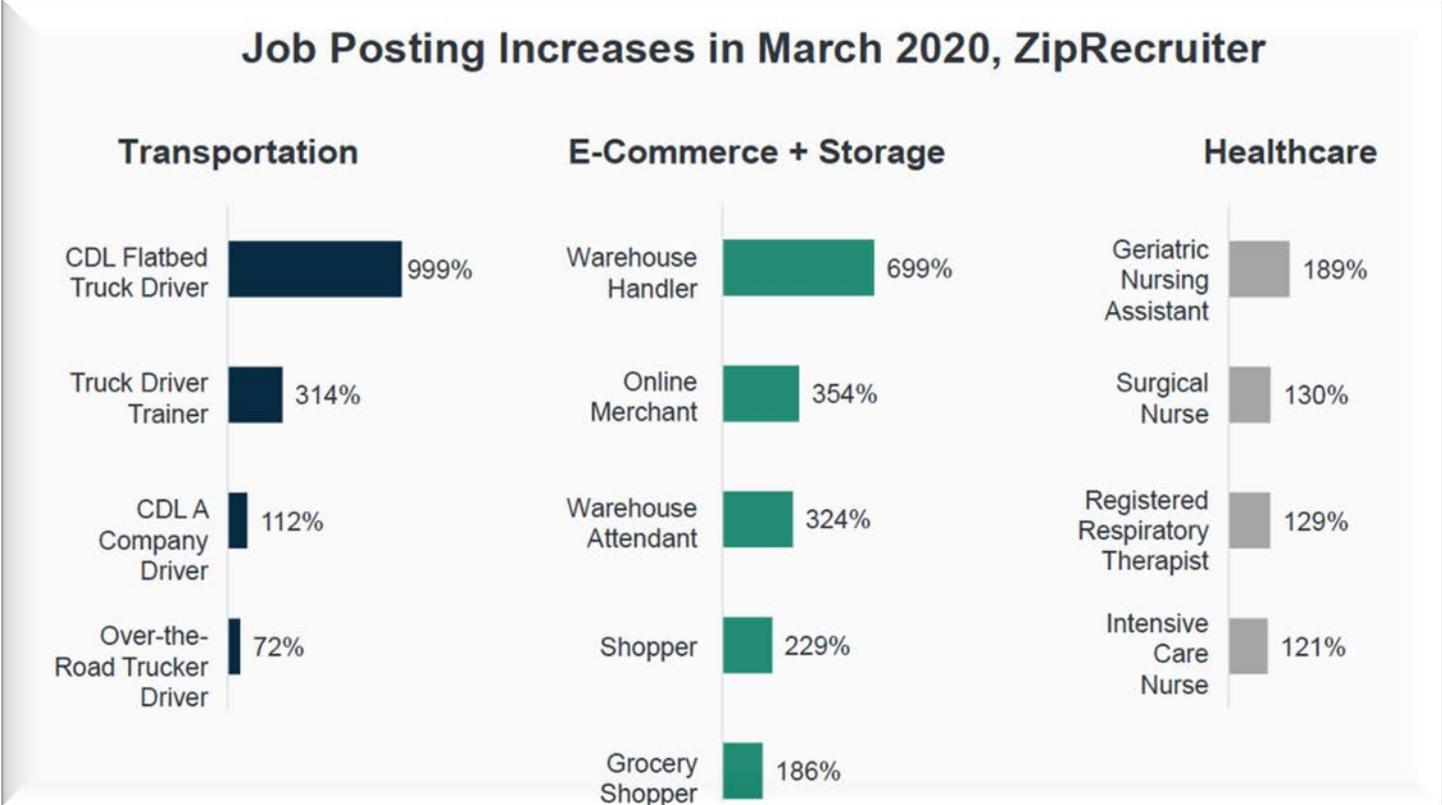
Founder & CEO of Truckl



- 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?



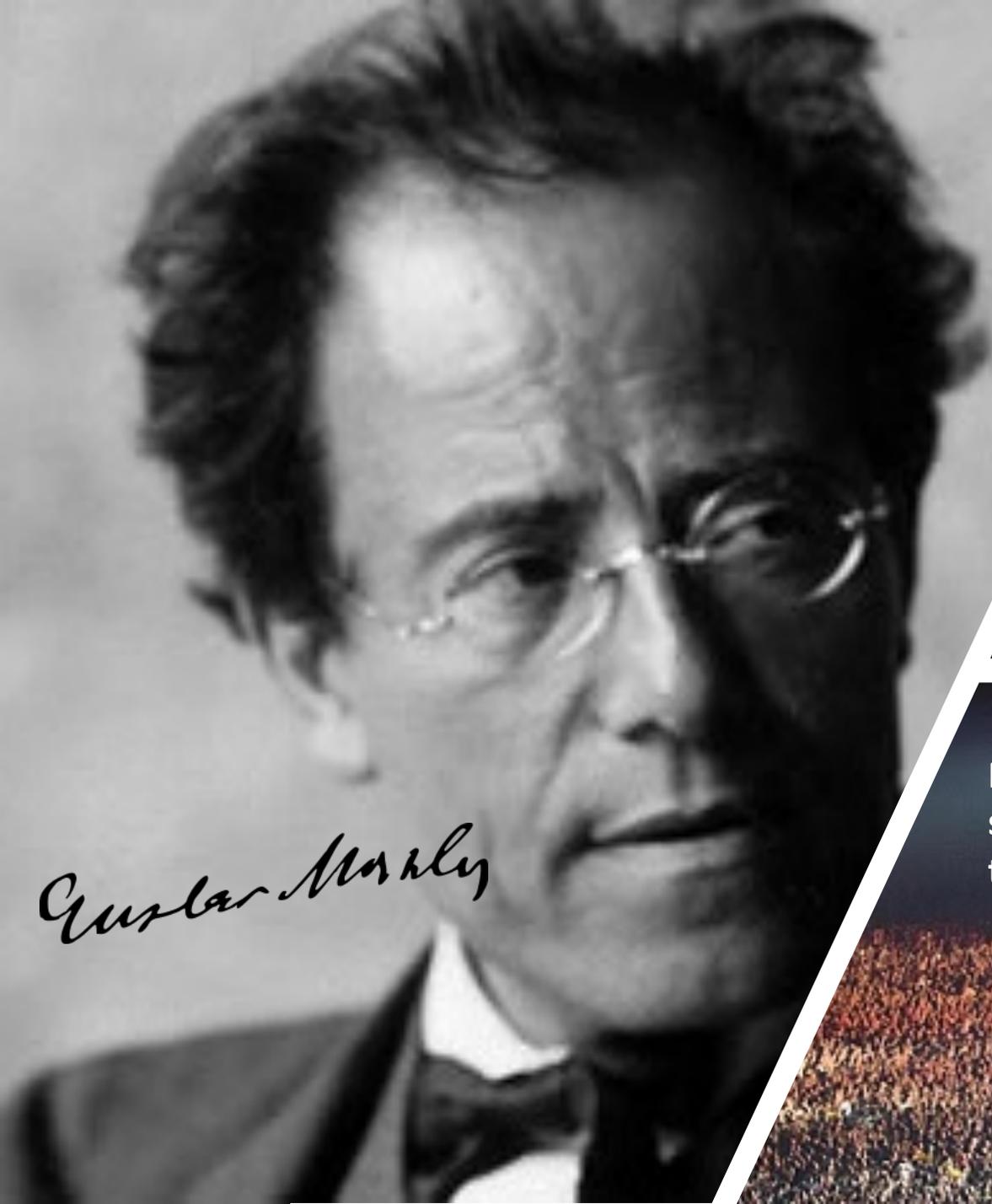
“The Americans have need of the telephone, but we do not. We have plenty of messenger boys.”

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.*

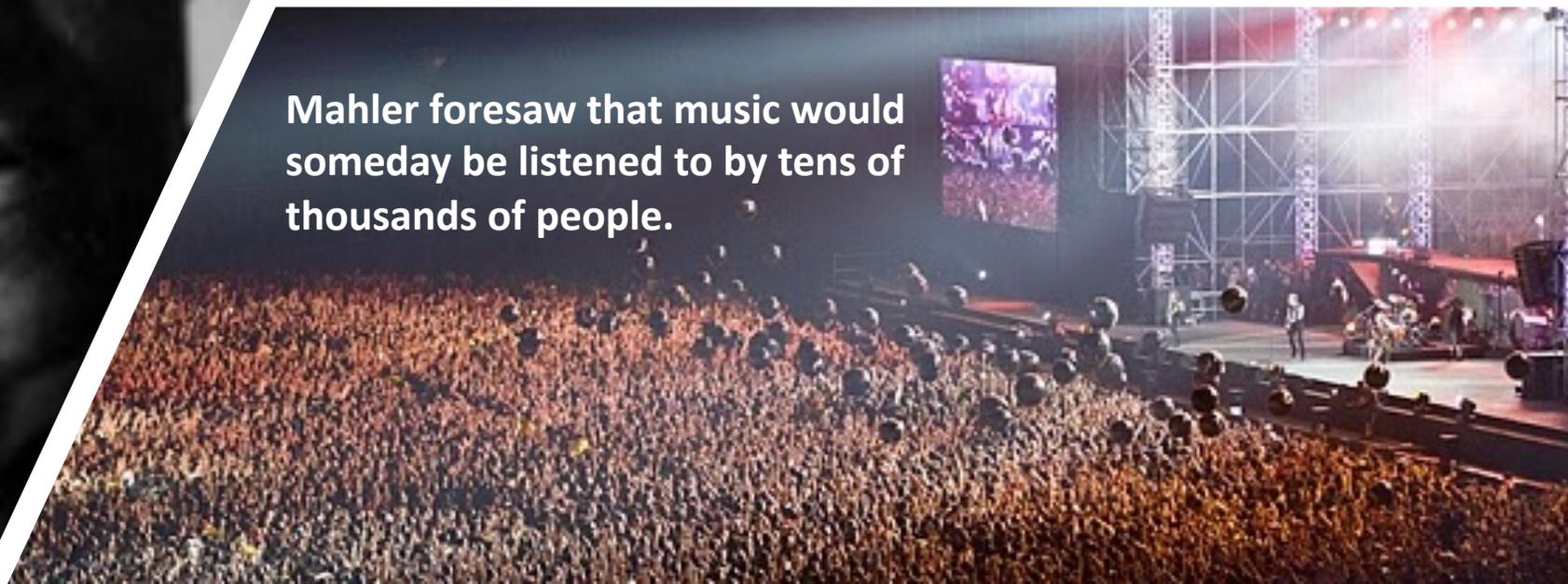
Think Big, Start Small, Move Fast!



Gustav Mahler



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





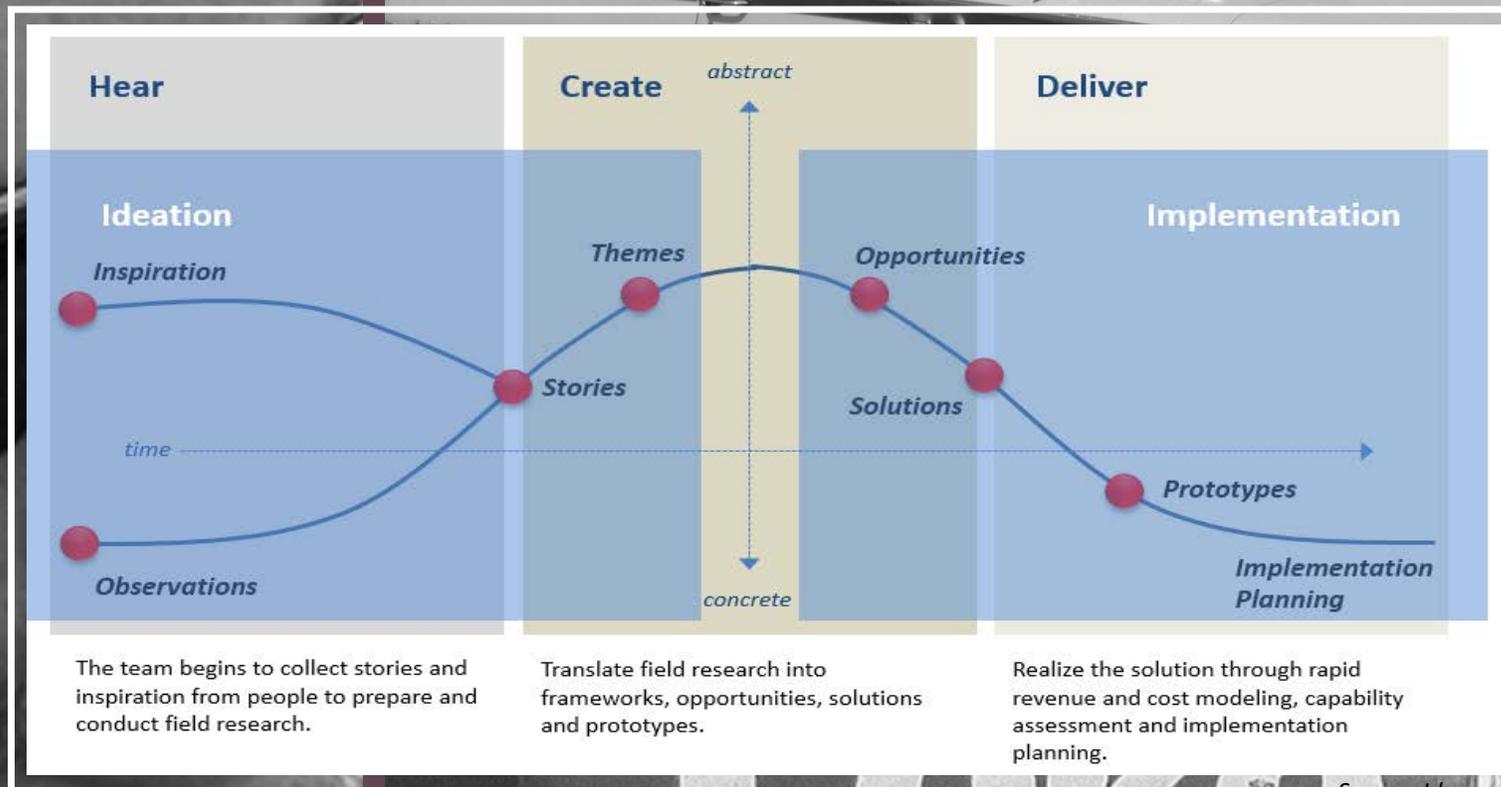
“**Innovation** is the market introduction of a technical or organizational novelty, not just its invention.”

“Creative **Destruction**”

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

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

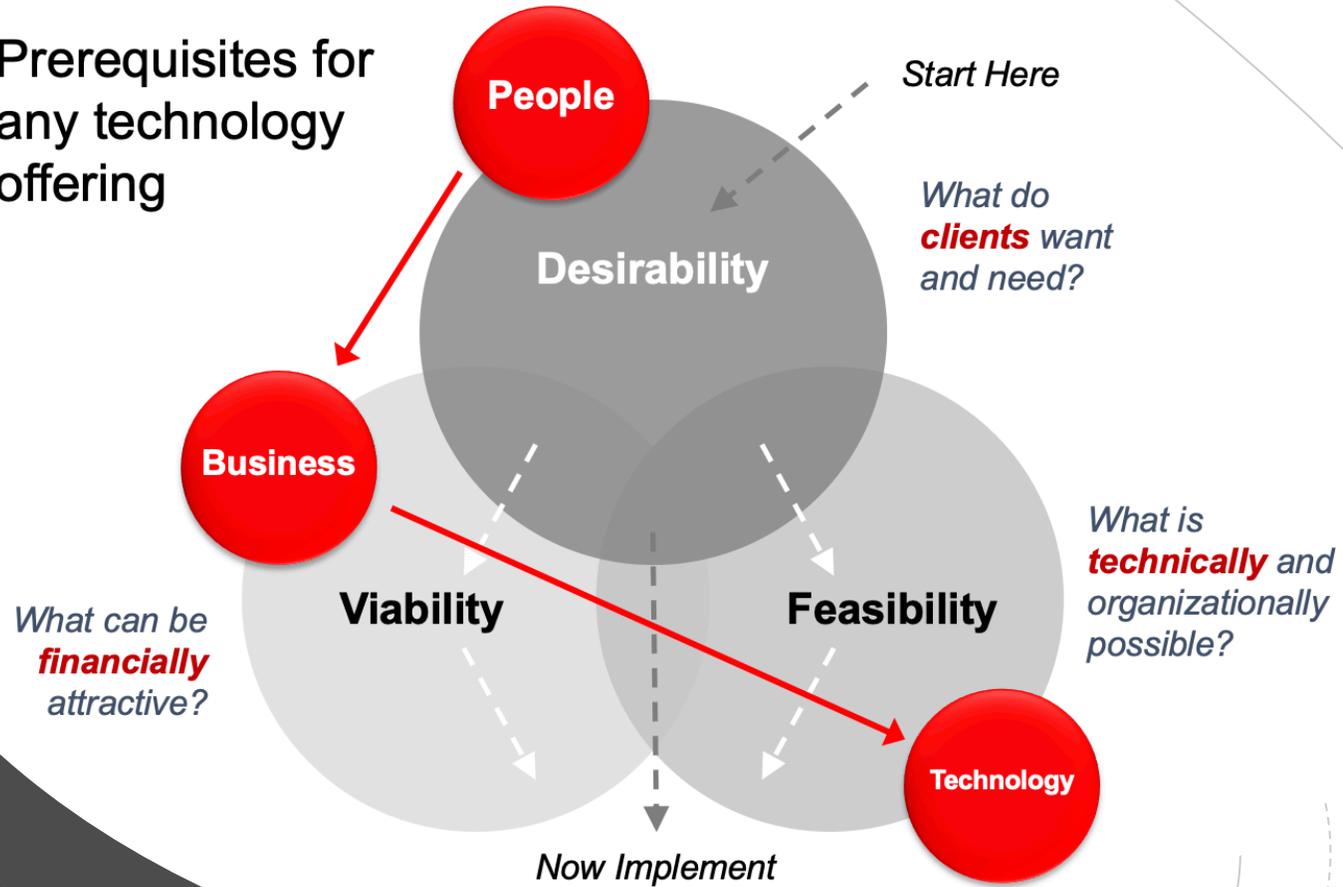
Joseph Alois Schumpeter



Source: Ideo

What Makes Innovation Work

Prerequisites for any technology offering



Source: Ideo

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



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

A photograph of the interior of an Amazon Go store. The shelves are stocked with various packaged food items, including bags of snacks and boxes of instant noodles. A sign above the shelves reads "MEALS MADE EASY" and 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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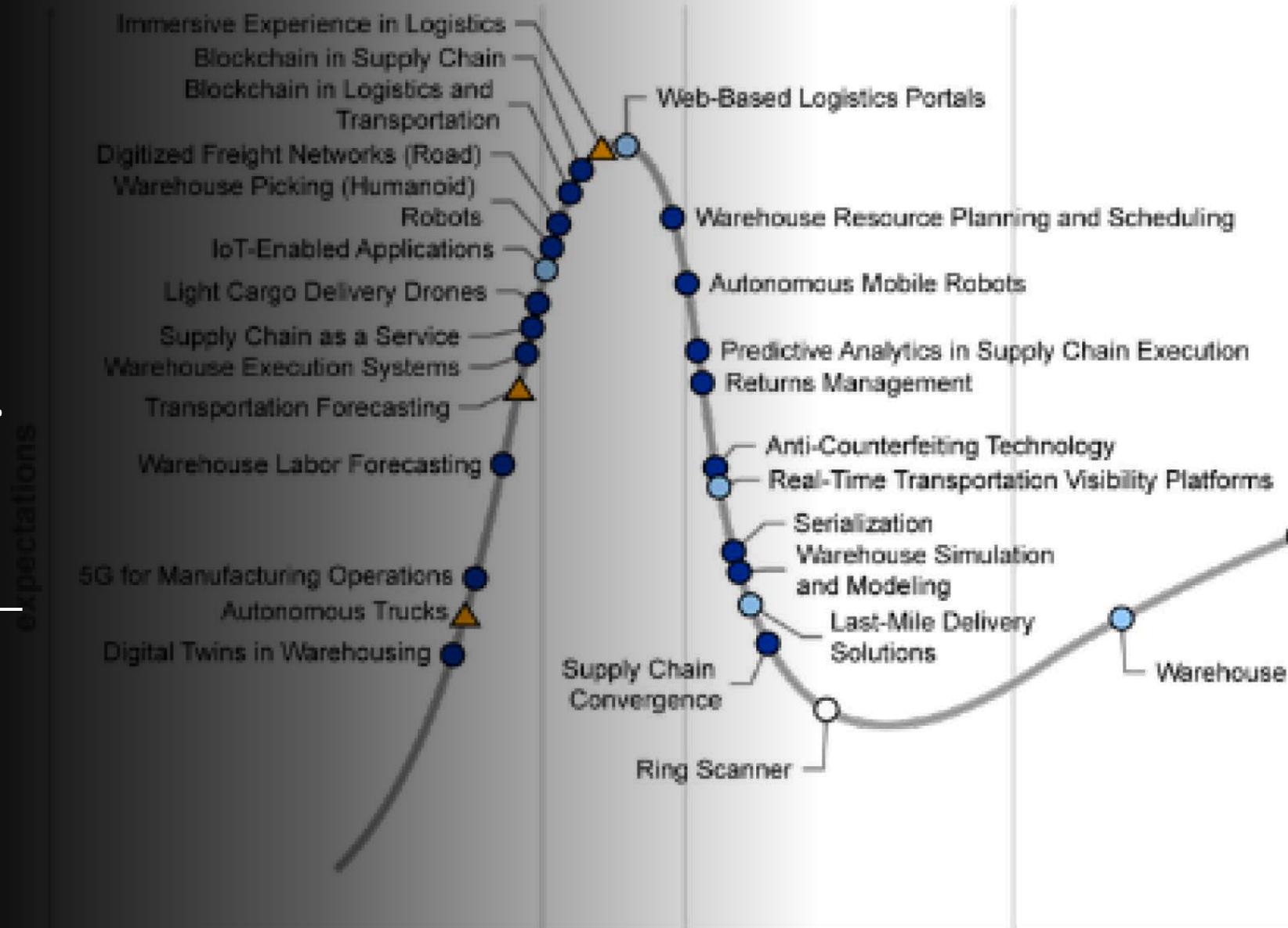
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Hype Cycle for Supply Chain Execution Technology

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



Source: Gartner, 2020



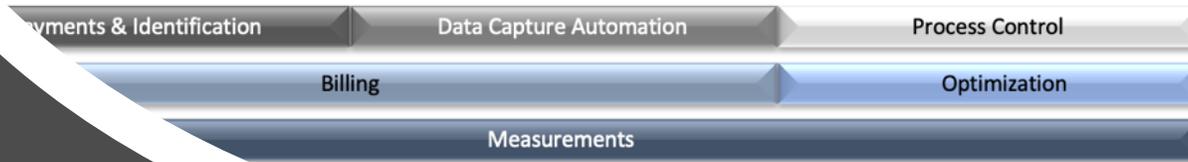
Shopping
Healthcare



Consumption
Mobility

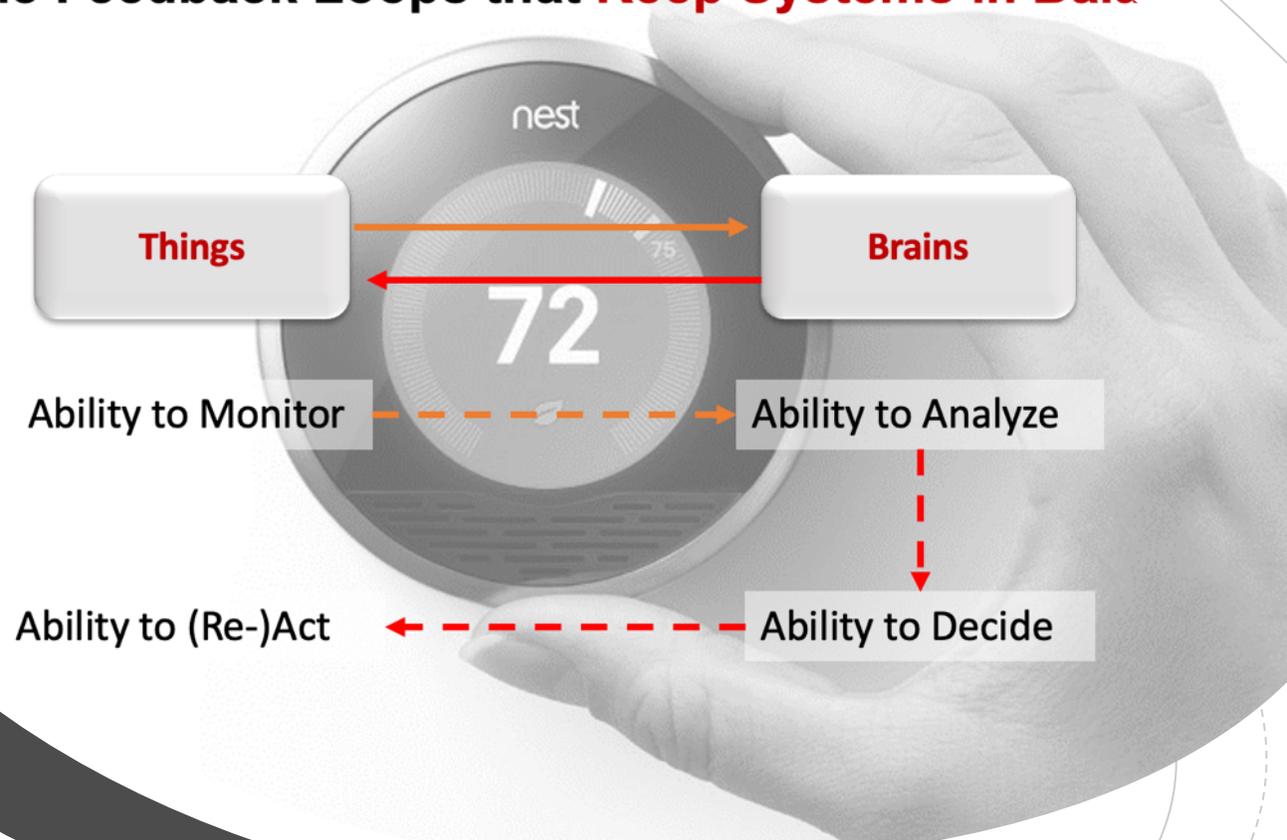


Flow Regulation
Early Warning



IoT is pervasive
and will continue
to grow (quietly)

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

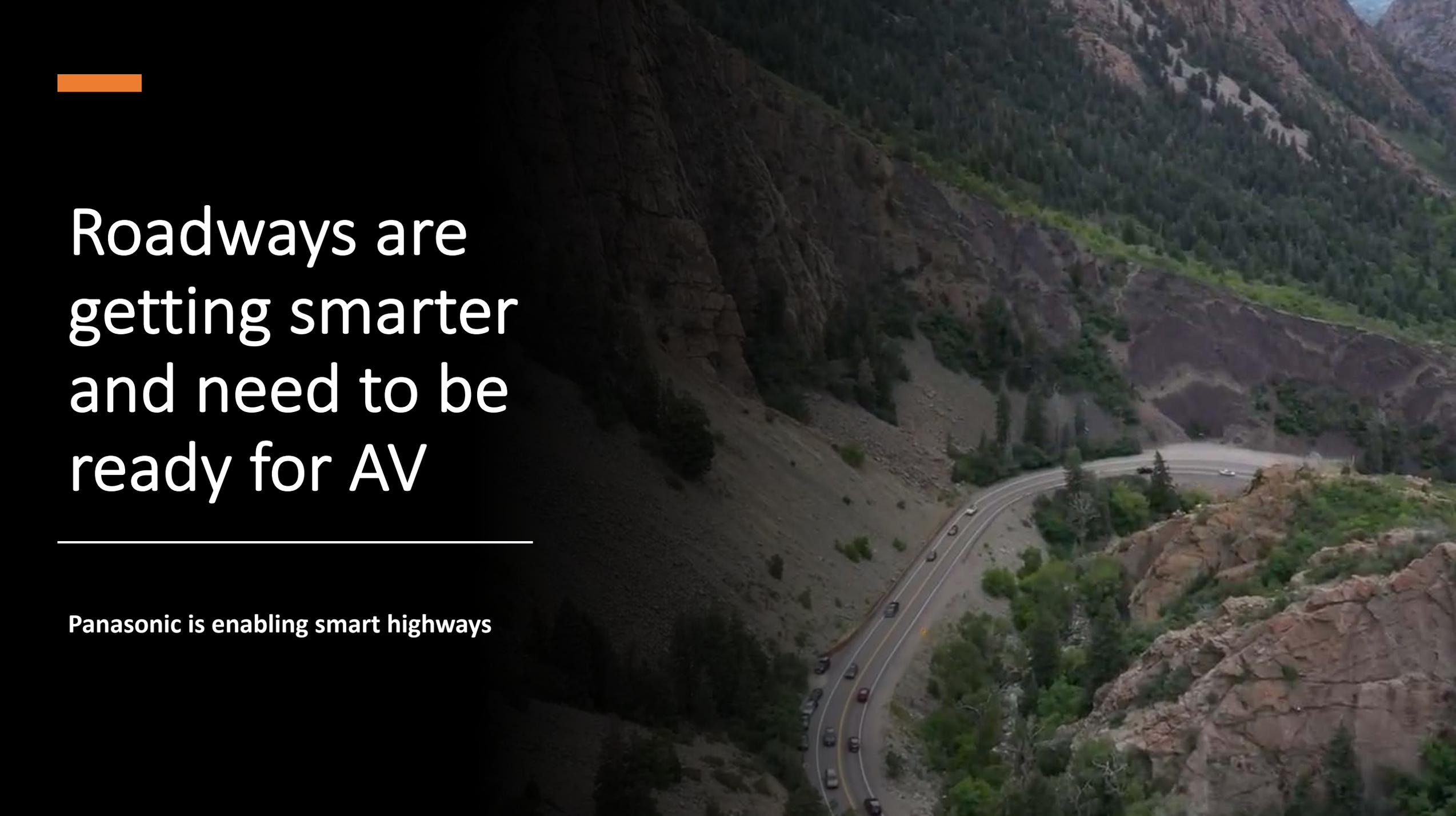


IoT enables
self-organizing
systems



Sensors
gradually
permeate our
lives

Toyota Woven City was designed for
sensors

An aerial photograph of a winding asphalt road through a mountain valley. The road curves through a landscape of rocky slopes and green vegetation. A road sign is visible on the left side of the road. The sky is clear and blue.

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



A person is holding a smartphone, displaying a 3D AR model of a mechanical part with two green spheres. The background is a blurred indoor setting, possibly a museum or exhibition space, with other people and structures visible. The text is overlaid on the left side of the image.

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 architectural lines and data patterns. A microphone is visible in the foreground. The overall scene is a digital news broadcast.

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

Xinhua uses virtual news anchors

An aerial, high-angle photograph 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-colored car on the left side of the road and a light-colored car on the right side. The text is overlaid in white, sans-serif font.

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



Traceability requires immutable ledgers, but ...

UNT, BAI and Truckl have proposed
tracking COVID test kits on-chain



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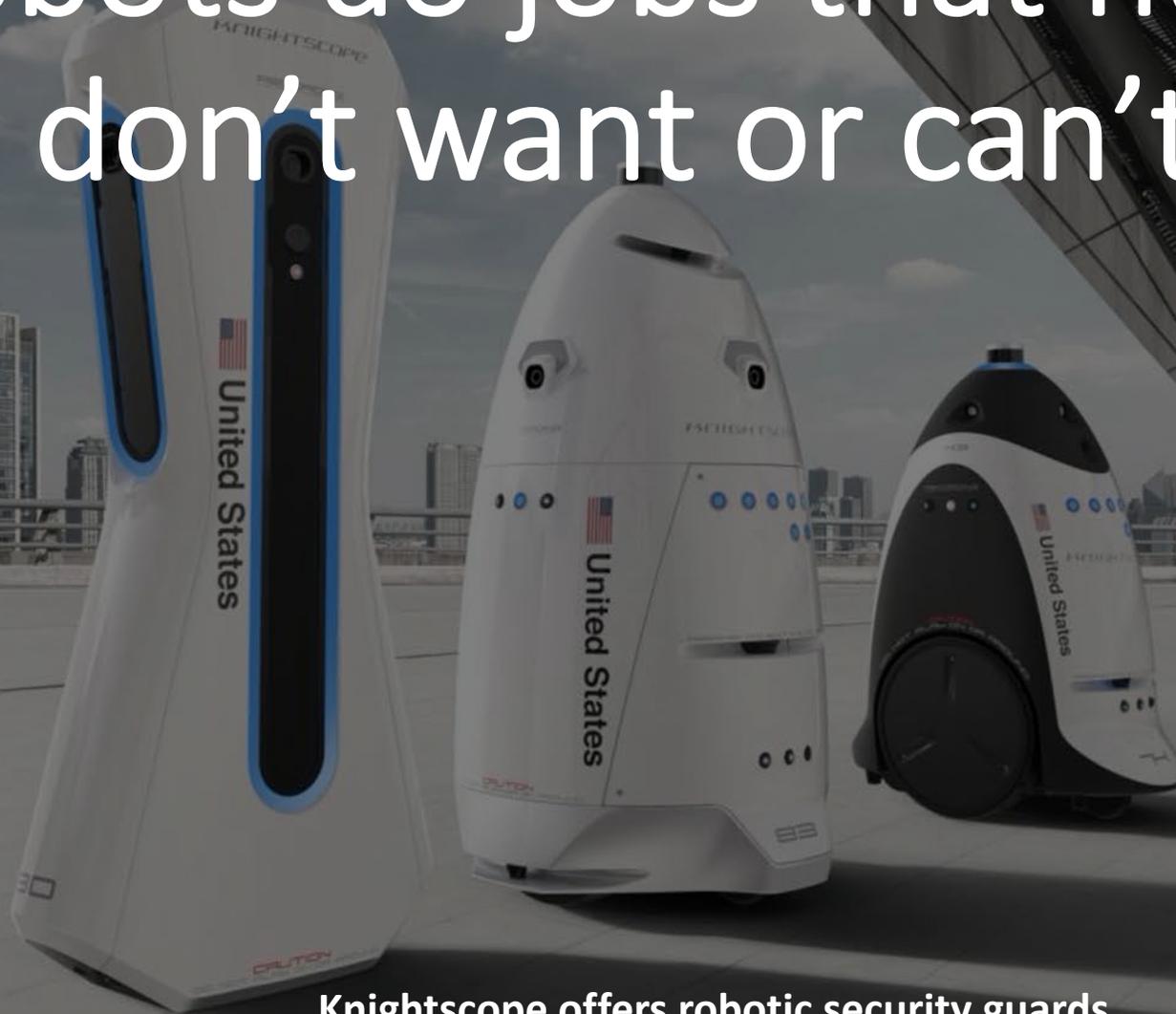


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Robots do jobs that humans
don't want or can't do

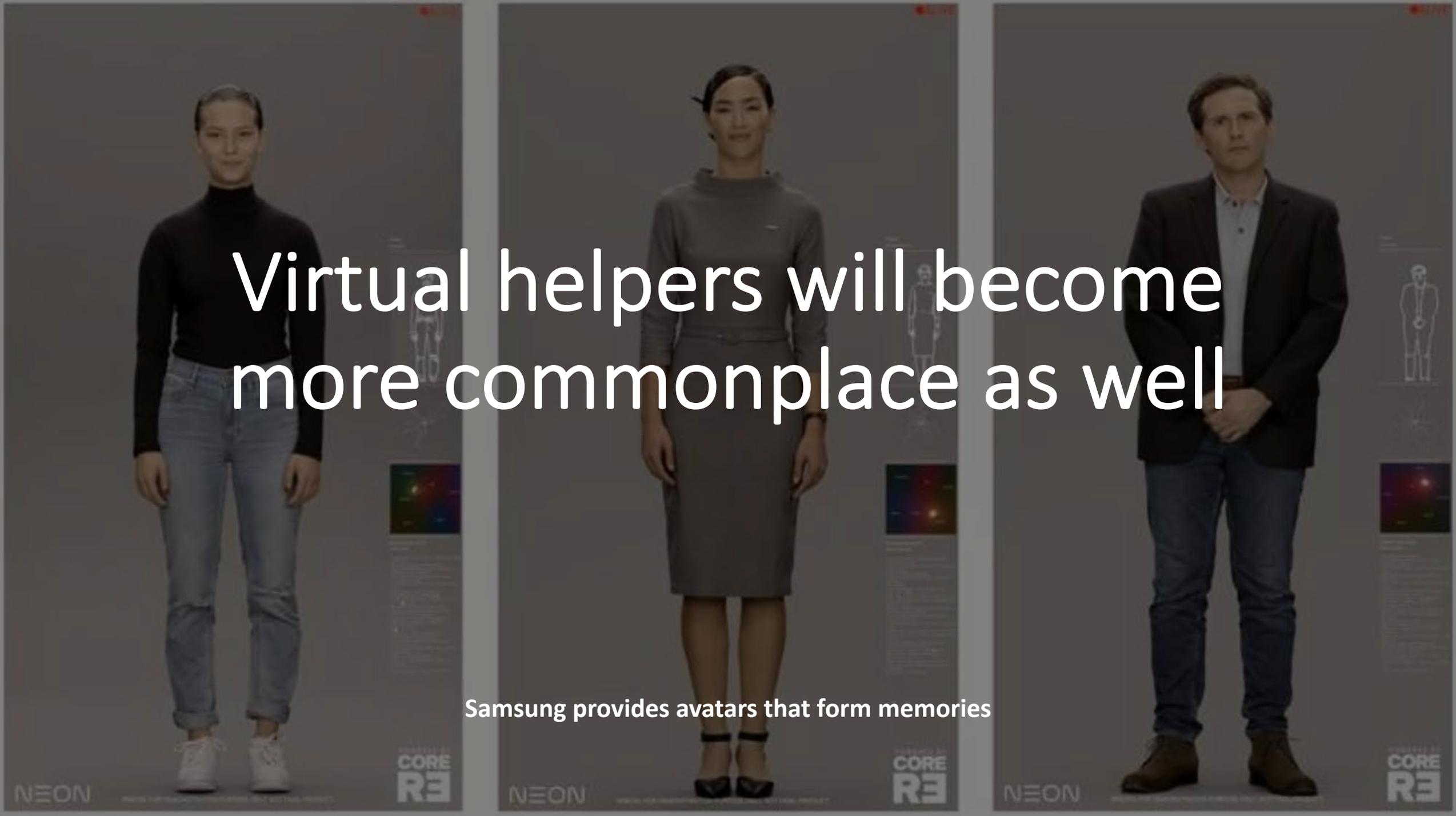


Knightscope offers robotic security guards

A Pepper robot stands in a public space, possibly a restaurant or cafe. To its left is a counter with a hand sanitizer dispenser labeled '消毒用' (Disinfection use) and several white containers with Japanese text. To its right is a white robotic vacuum cleaner. The robot has a tablet on its chest displaying a menu or interface. The background shows a stone wall and a window with blinds.

Sometimes they are actually
better suited than we are

Pepper greeting robot used for social distancing

The image features three virtual avatars standing side-by-side. The avatar on the left is a woman with her hair pulled back, wearing a black turtleneck and light blue jeans. The middle avatar is a woman with dark hair, wearing a grey turtleneck and a grey skirt. The avatar on the right is a man with short dark hair, wearing a dark blazer over a light blue shirt and blue jeans. The background is dark grey with faint white technical diagrams of human figures and some illegible text. At the bottom of each panel, there is a logo for 'NEON' and 'CORE RE'.

Virtual helpers will become
more commonplace as well

Samsung provides avatars that form memories

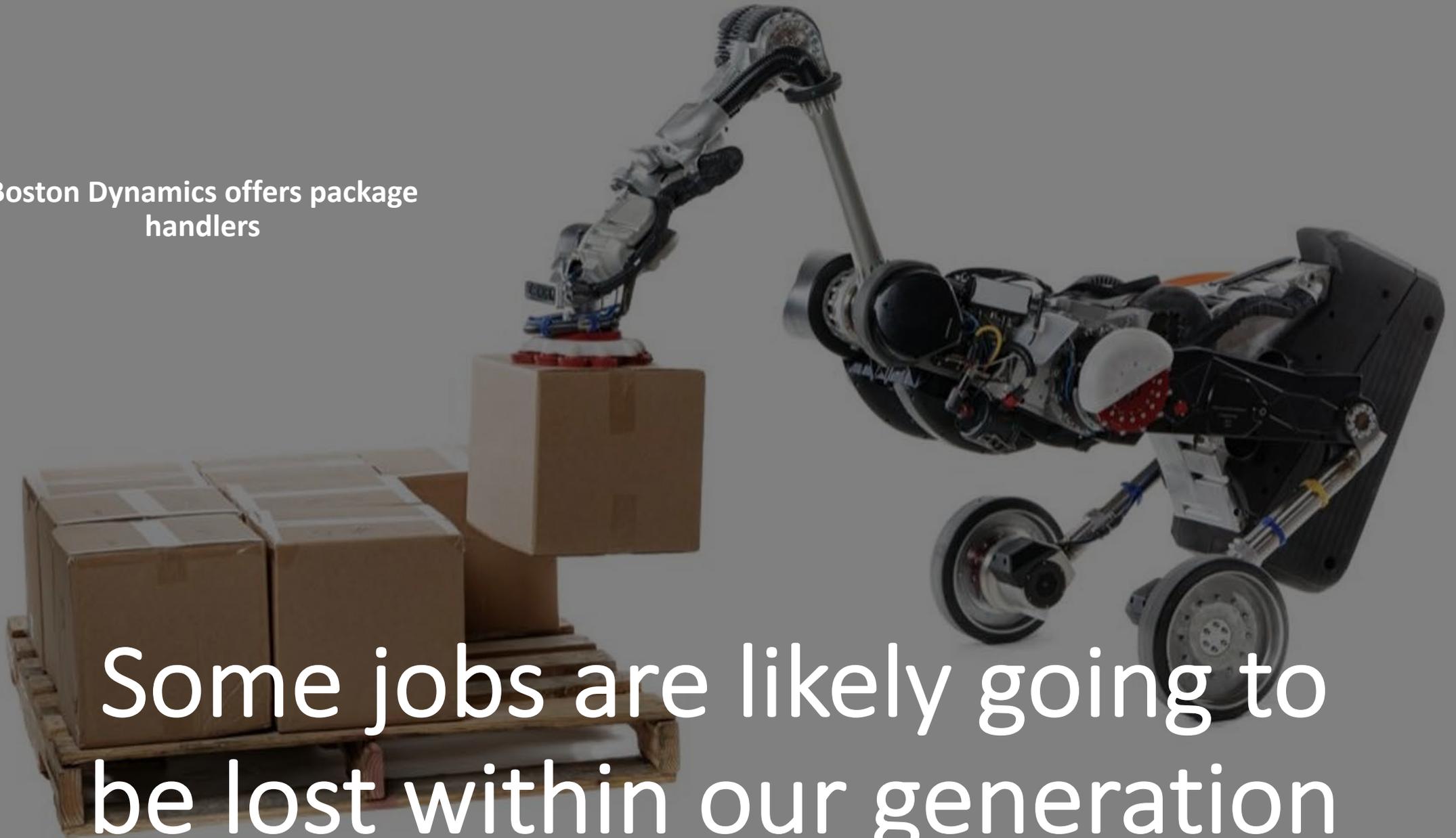


Avatars help in situations where humans would be overwhelmed

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



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

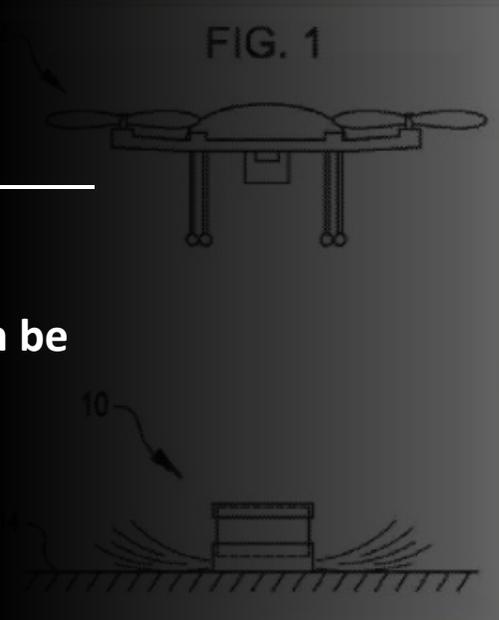
...

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 standing in a dark environment, holding a long, thin rod or tool. They are positioned next to a complex piece of machinery, which is a Mars rover. The rover is covered in gold-colored thermal insulation and has several large, treaded wheels. The scene is lit from the side, creating strong highlights and deep shadows. The overall atmosphere is technical and futuristic.

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



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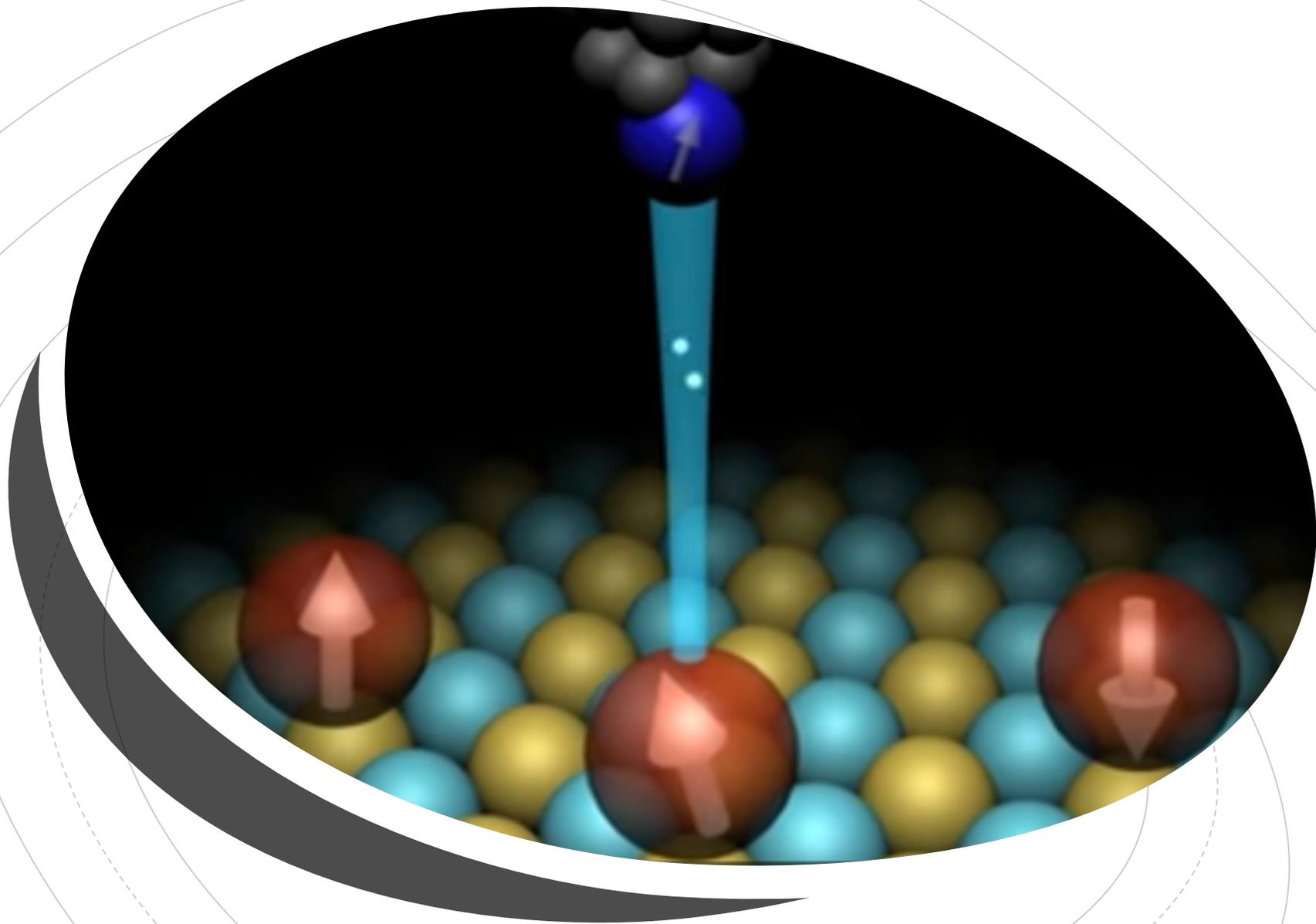
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- Everything Real-time
- Dazzling Possibilities
- New Friends
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Molecular
Storage

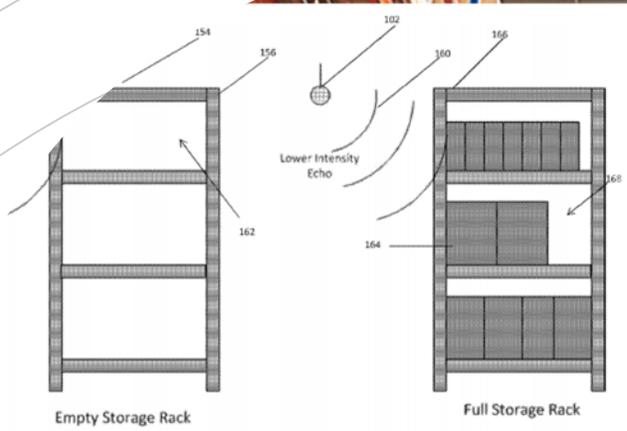


FIG. 1B



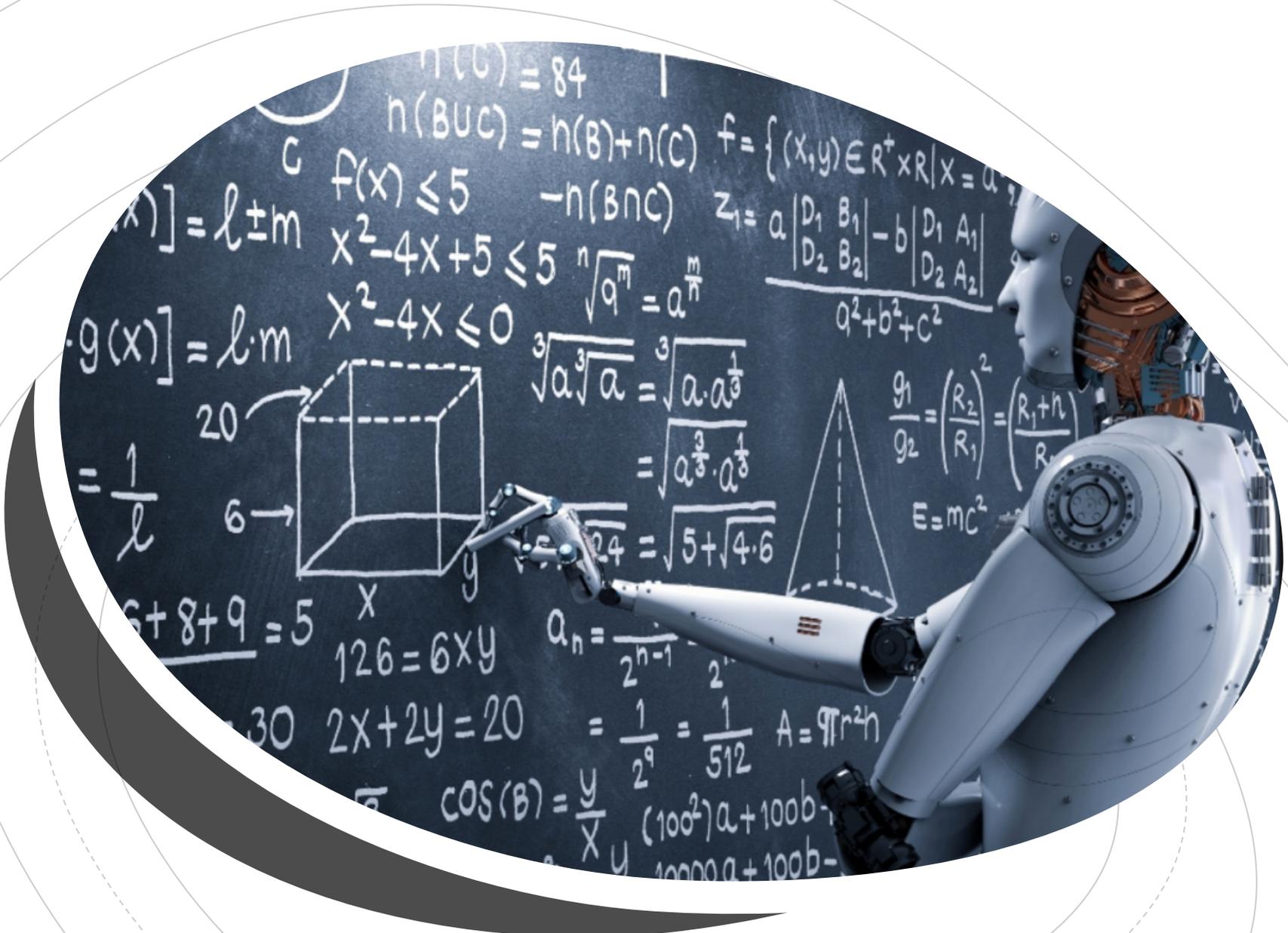
Inventory Sounds



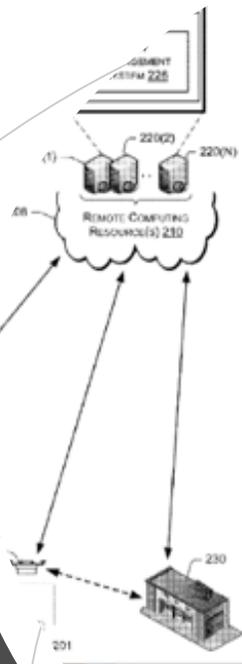
Quantum Computing



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.

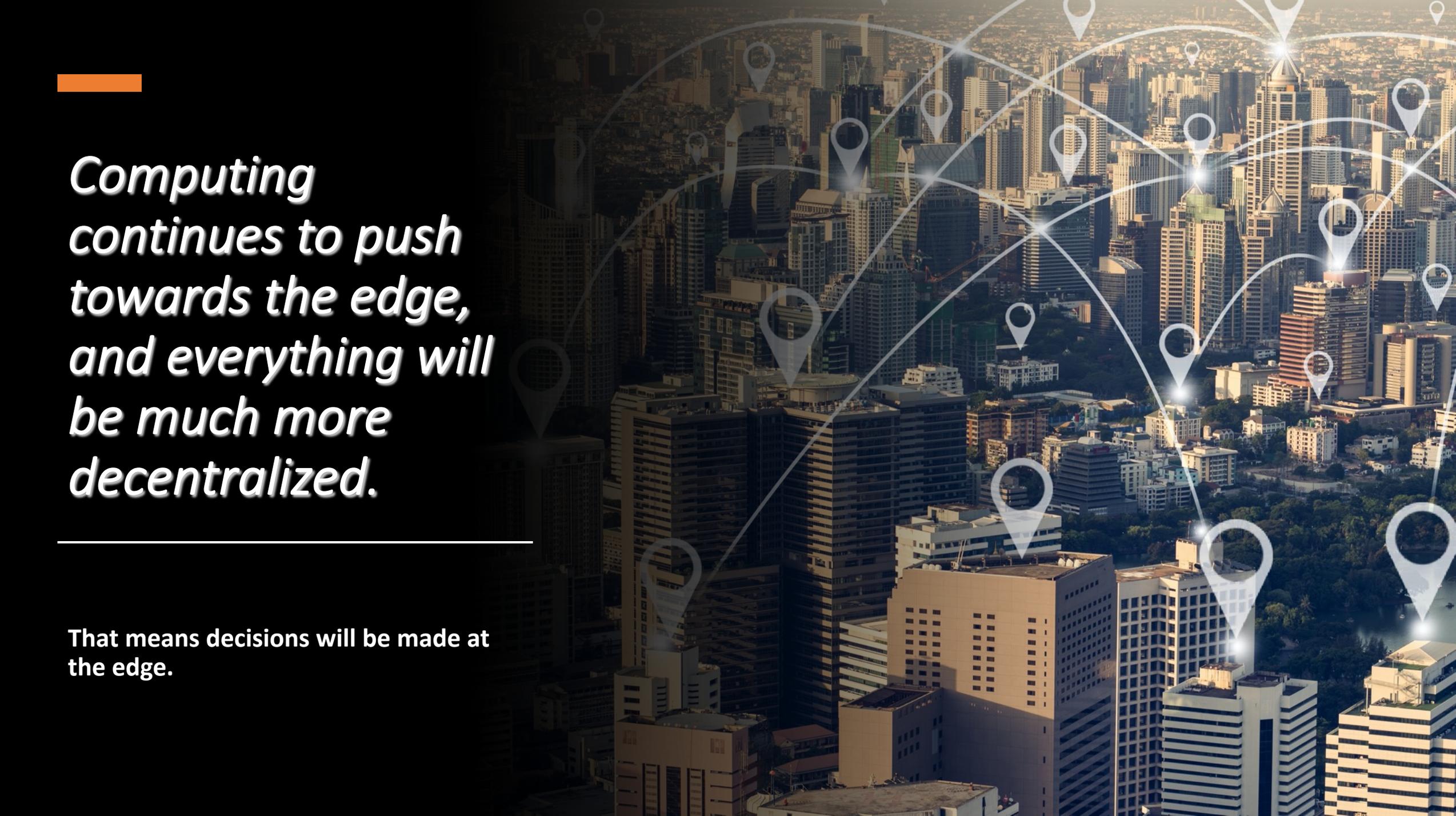
Optimization doesn't stop within your organization. It's just a matter of time.



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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