

# Forward thinking supply chains continued >>>

**SAPICS**  
THE PROFESSIONAL BODY FOR  
SUPPLY CHAIN MANAGEMENT

IN ASSOCIATION WITH  
**saaff**

**20 September 2023**

## **SAPICS Spring Conference**

Indaba Hotel, Fourways, Johannesburg, South Africa

### **Future Proofing Your Warehouse**

Martin Bailey

Industrial Logistic Systems

**ILS**  
INDUSTRIAL LOGISTIC SYSTEMS

## What we will discuss today:

- Background to the future warehouse
- Inside the eCommerce & small items picking
- Automation
- AGV vs AMR
- Environmental Trends
- Manual assisted systems
- Other interesting “stuff”



# Age Of Faith

(Dark ages)

200 AD – 1700 AD







**Age of Reason** (sometimes)  
**Age of Enlightenment** (sometimes)  
1700 AD – 2000 AD





2000AD + Age of Digital Intelligence (sometimes)



# Trends That Will Drive the Warehouse of the Future



## WAREHOUSE MANAGEMENT

Location	Item	Pieces
SG01	0005	05
SG02	0089	07
SG03	0195	09
SG04	0250	10
SG05	995	12

- OVERVIEW
- VEHICLE STATUS
- CUSTOMER
- SUPPLIER
- TRANSPORTATION
- SETTING



ORDER PICK TIME 00:30:00

ORDER PICK TIME 04:55:00



- 20%
- 15%
- 8%



25%

CONTROL

LOW



## Trends That Will Drive Your Warehouse

- AI
- More data
- Changing customer base
- Flatter world
- I want it now
- Faster
- More SKU
- Labour
- ESG
- New range of manufacturing



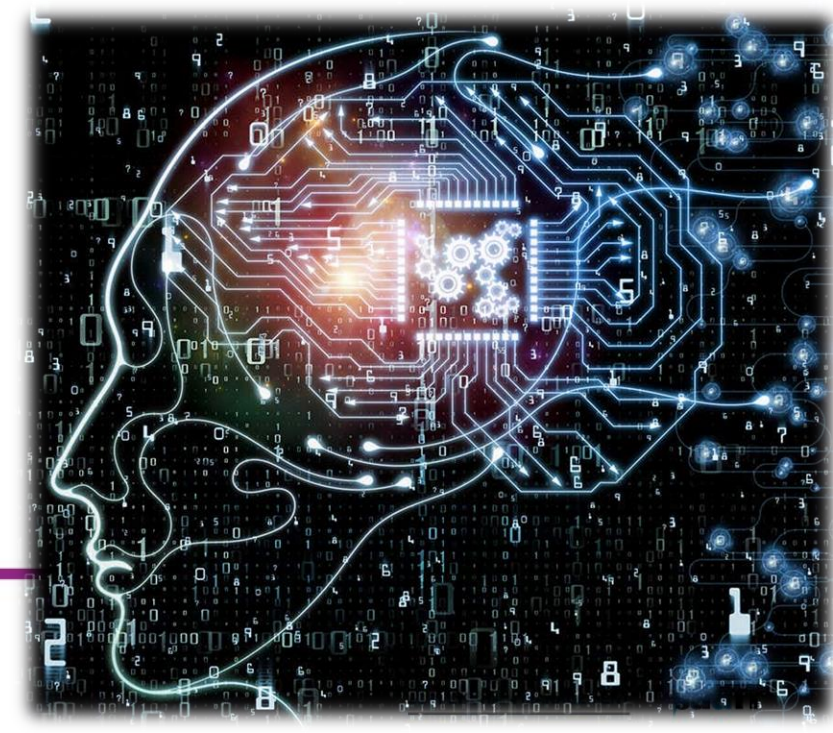
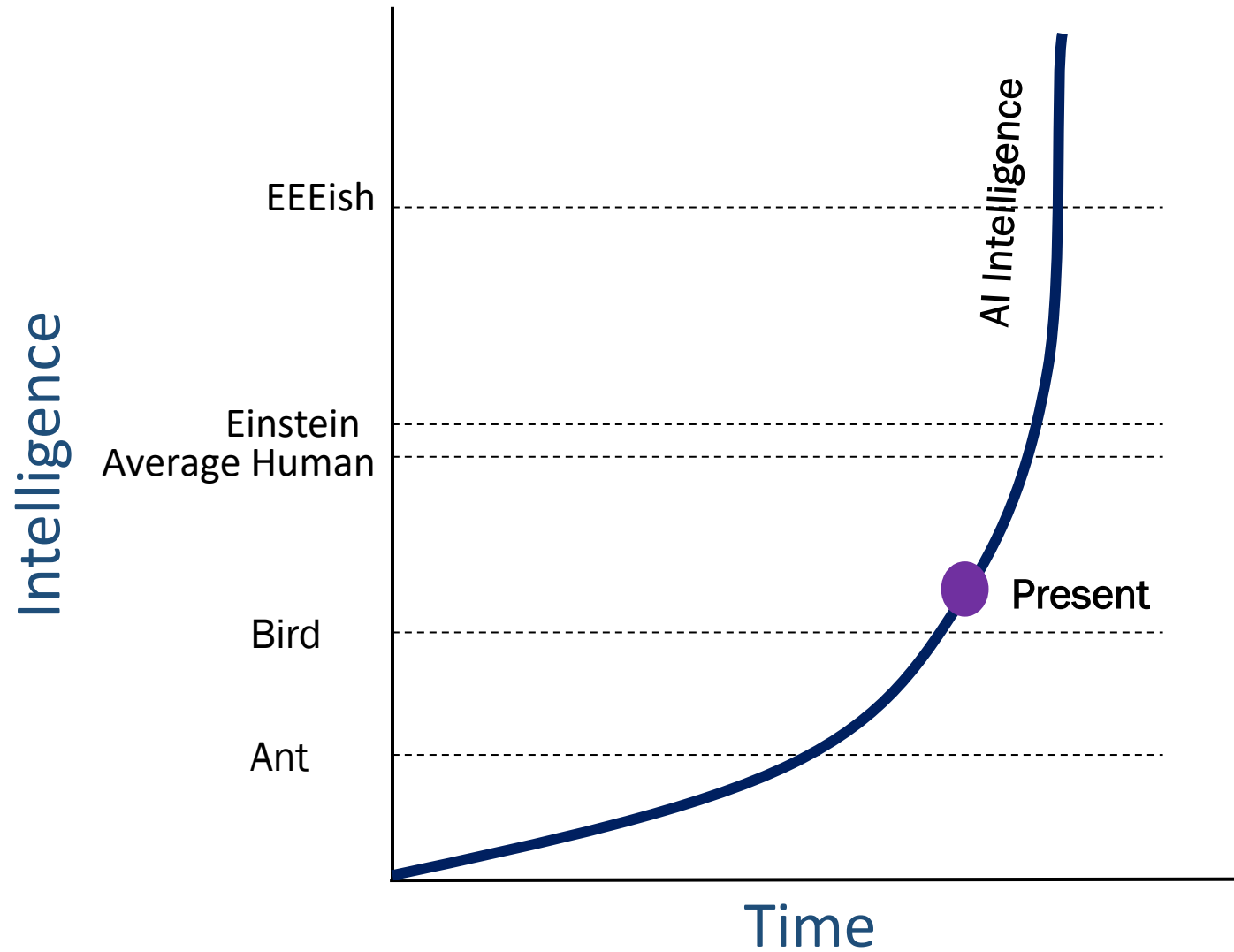




ARTIFICIAL  
INTELLIGENCE

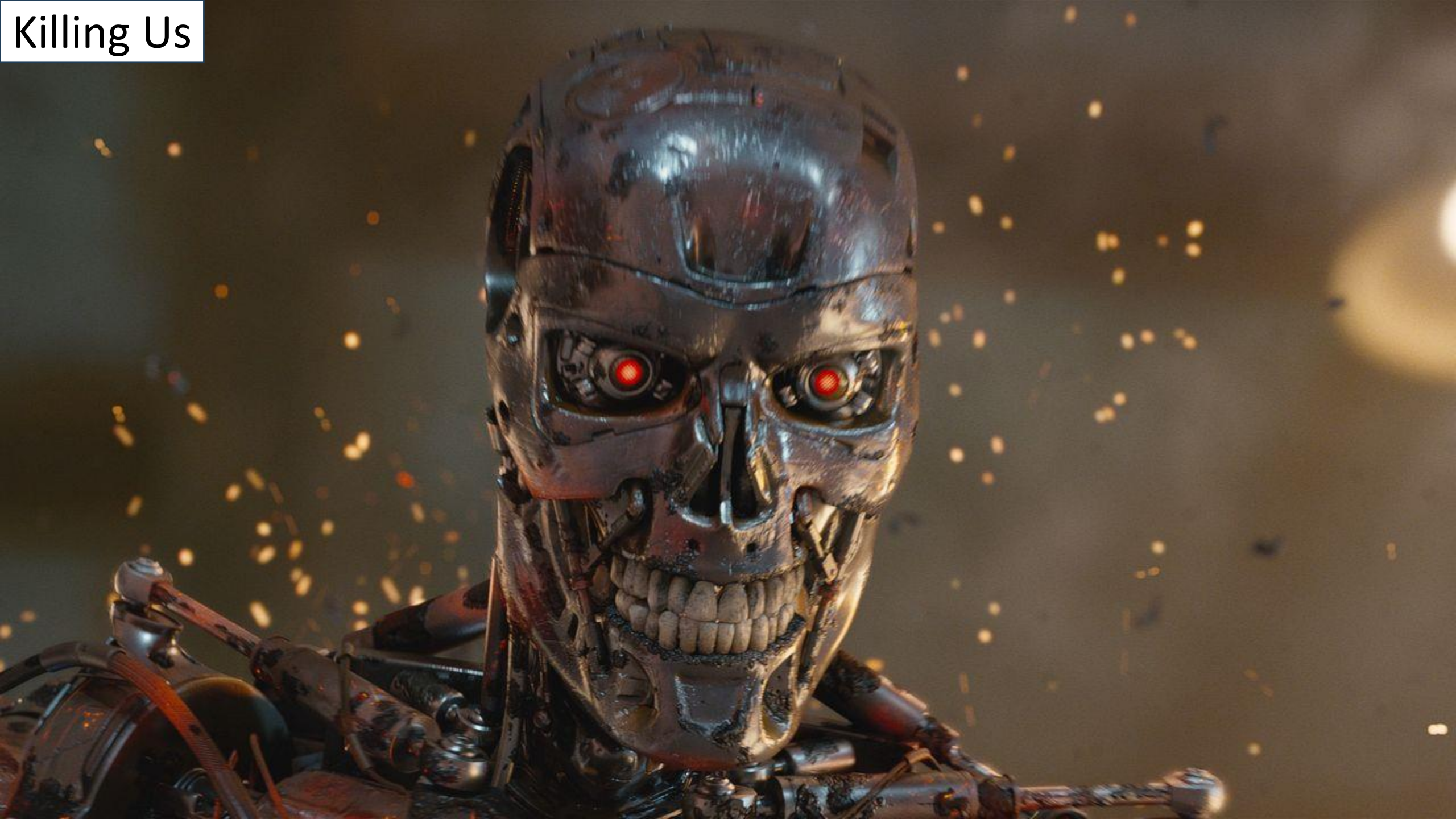


# Growth of AI

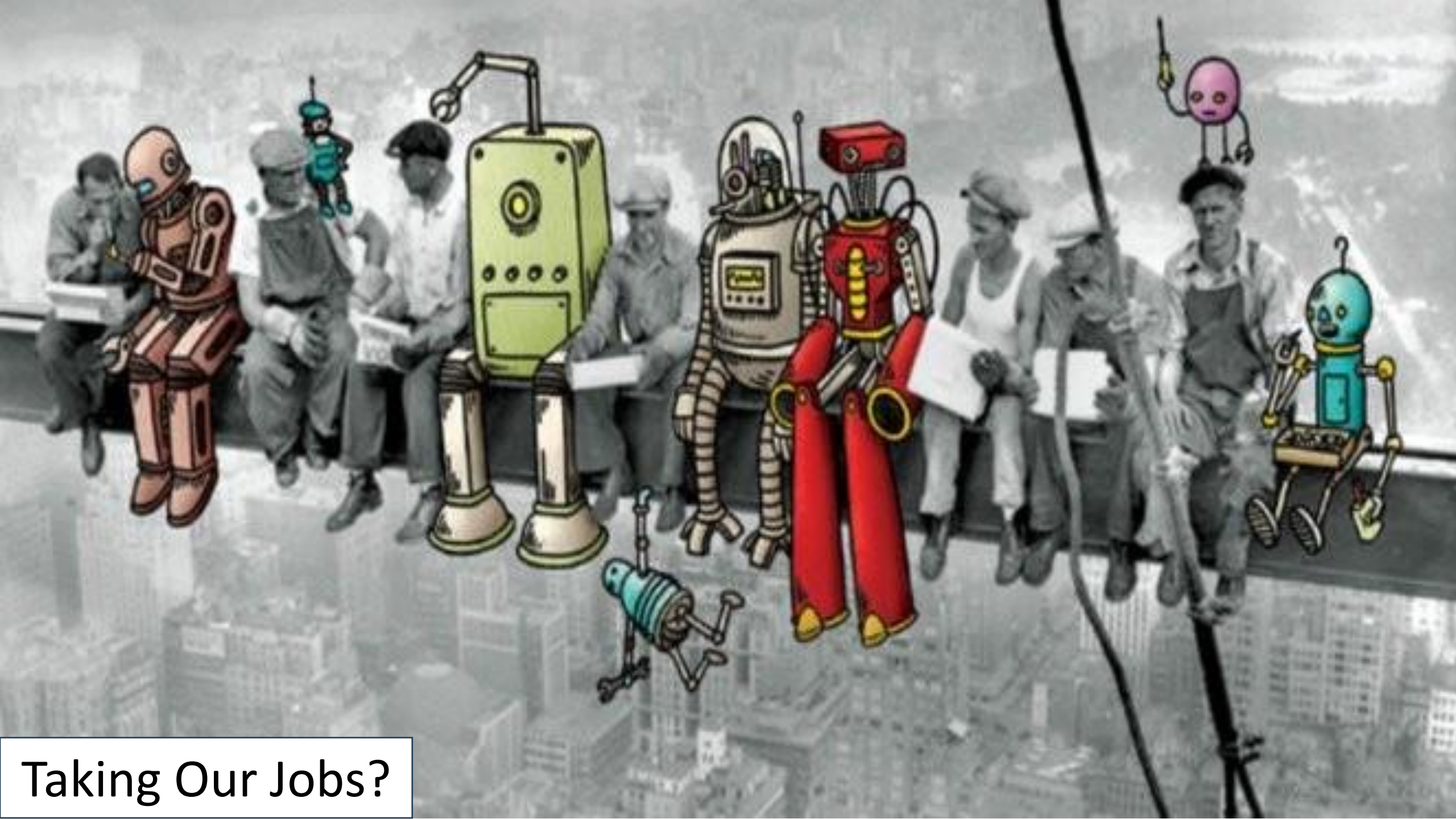




Killing Us







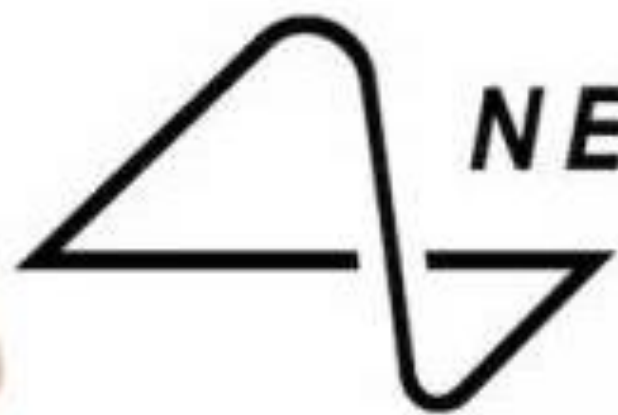
Taking Our Jobs?





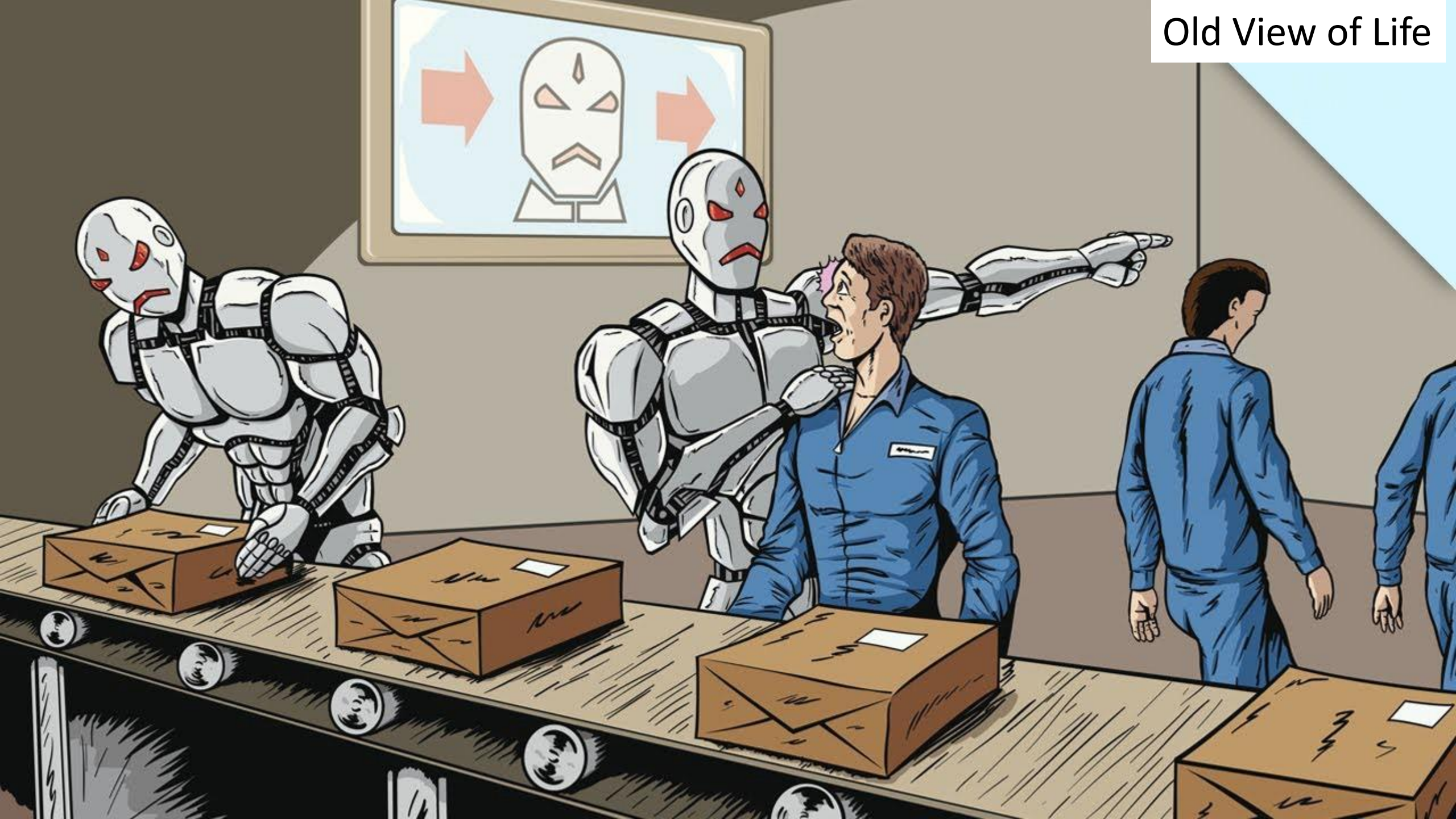
BCCL





**NEURALINK**

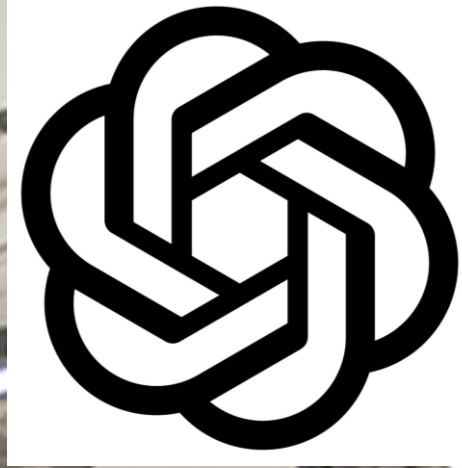














# Not Everyone





# Data – Data – Data

- More data
- Smarter data
- Big data (useable data)
- Blockchain
- Perfect place for AI – on a large scale





# Changing Customer Base





# Flatter World





**I WANT  
IT  
NOW!**





amazon Prime  
amazon.com/sameday  
FREE SAME-DAY DELIVERY

amazon Prime  
amazon.com/sameday  
FREE SAME-DAY DELIVERY

amazon Prime  
amazon.com/sameday  
FREE SAME-DAY DELIVERY

amazon Prime  
amazon.com/sameday  
FREE SAME-DAY DELIVERY

amazon Prime  
amazon.com/sameday

NO PATIENCE  
REQUIRED

FREE SAME-DAY DELIVERY





Faster



# I Want It Now & Faster!

- More channels to customers
- More decentralisation
- More / less automation
- More labour
- Less efficient transport
- Better management systems
- Higher stock levels
- Faster everything



**I WANT  
IT ALL  
AND  
I WANT  
IT NOW**





I want variety?



# More SKU Equals

- More space
- Poor space utilization
- More pick slots
- More people
- Poor truck utilization
- More checking
- More difficult inventory control
- More difficult packing

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# Paradox Of choice





# Is This The Biggest Influence





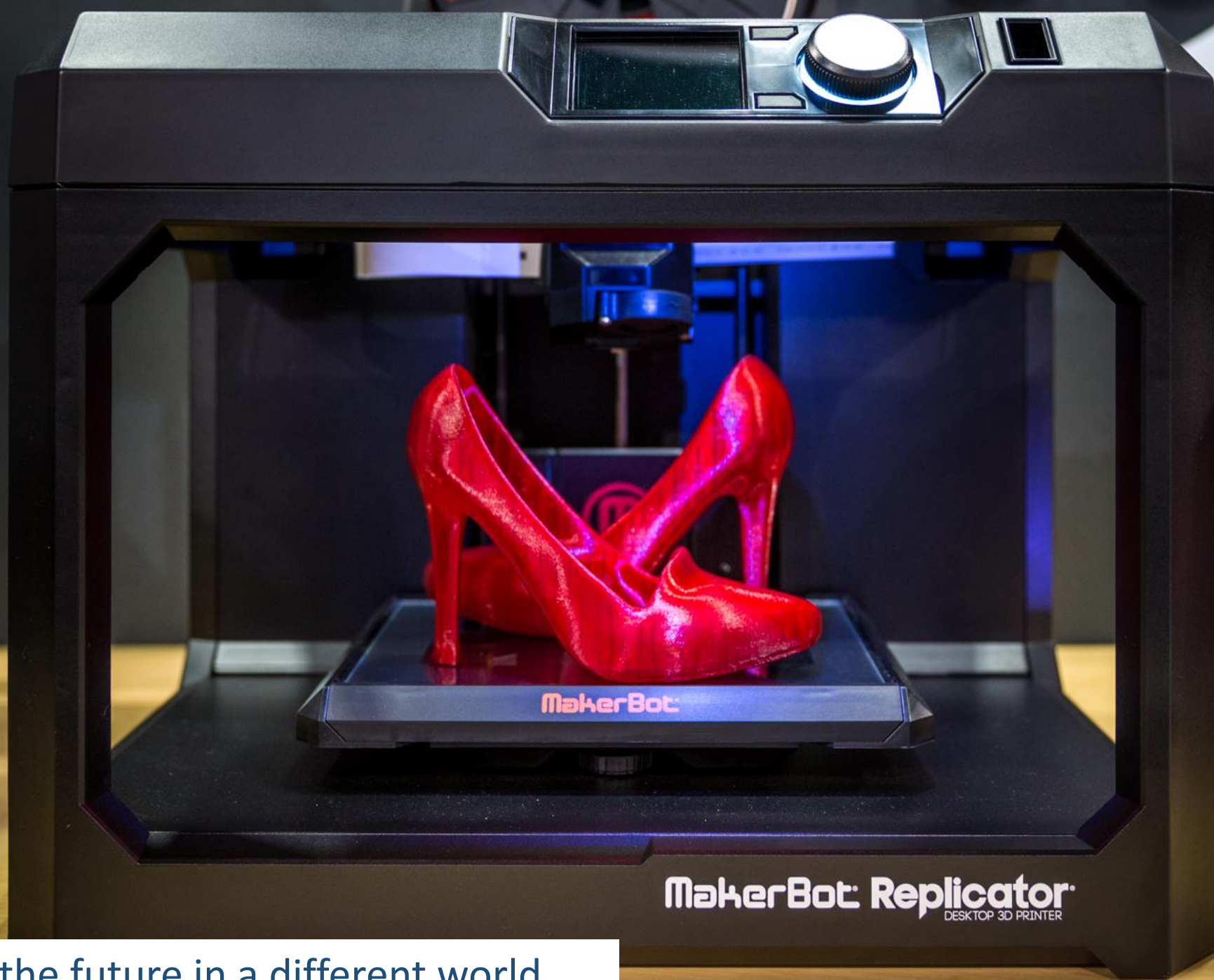
# ESG principles



Tesla was given an ESG score of 37 out of 100, while Philip Morris was scored an 84

## Need Finance?



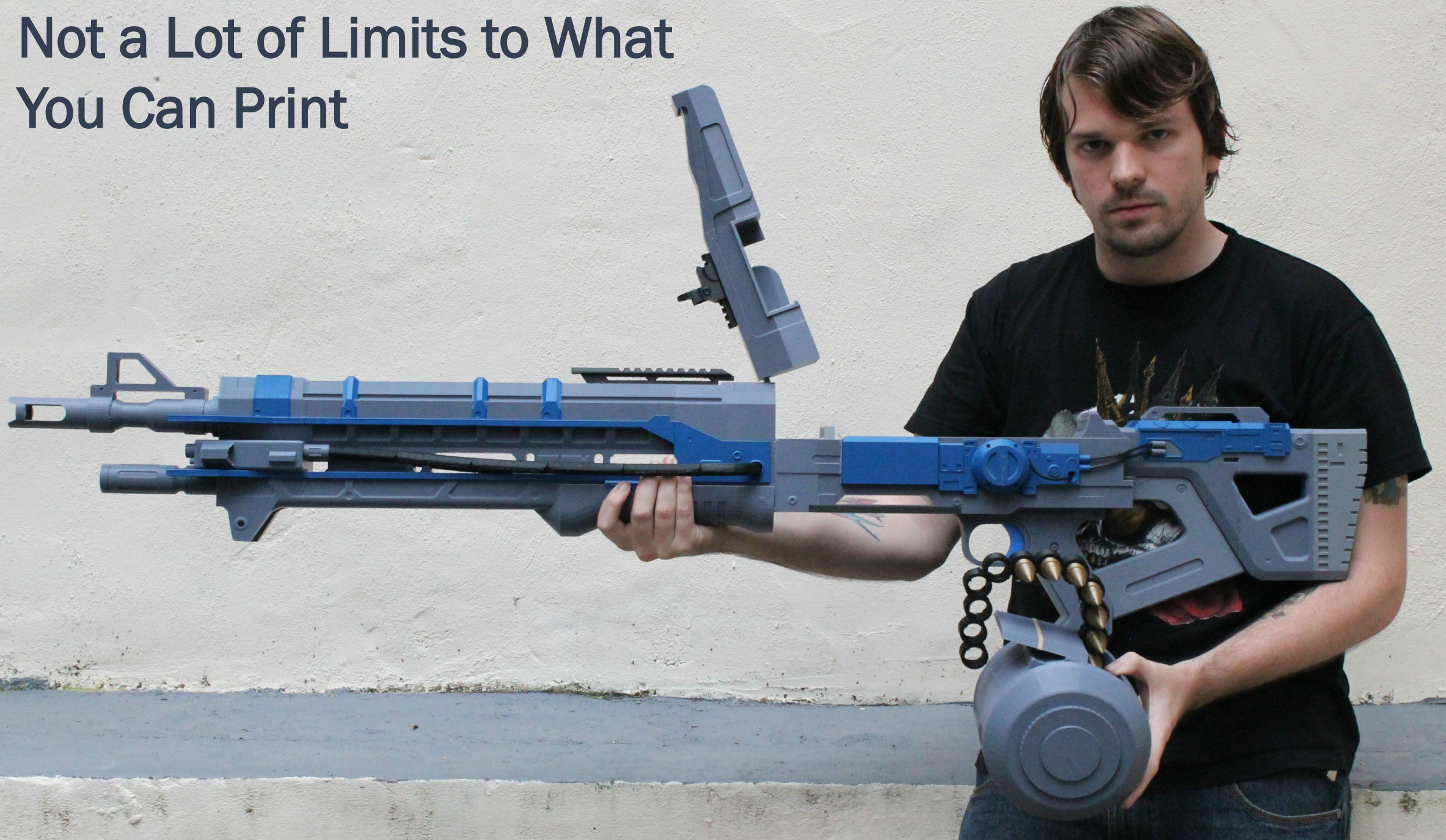


**MakerBot Replicator**  
DESKTOP 3D PRINTER

Warehouse of the future in a different world



Not a Lot of Limits to What  
You Can Print





No Limits?





**Anyhow, Welcome To  
Your Warehouse of  
the Future?**





**B**

BACK

**2**

TO

**R**

REALITY



# For The Supply Chain The past & now

Still 80% of  
Operations

**Dysfunctional**  
Supply Chain  
in silos

**Functional  
excellence**  
(get components  
working well)

**Integrate &  
optimise**  
Supply Chain  
components across  
enterprise

**Better Collaboration**  
across supply chain  
& better use of data

**On Demand**  
Supply Chain with  
increased **variety**



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# Traditional Silo Based Supply Chains





# Ideal World



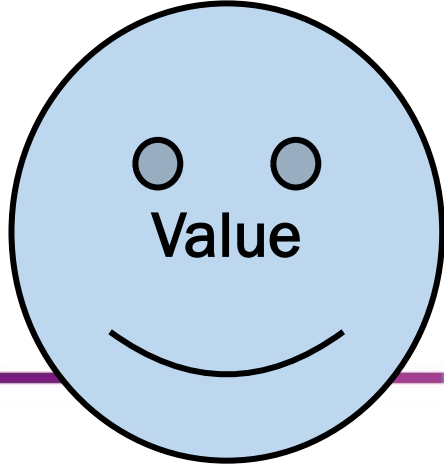
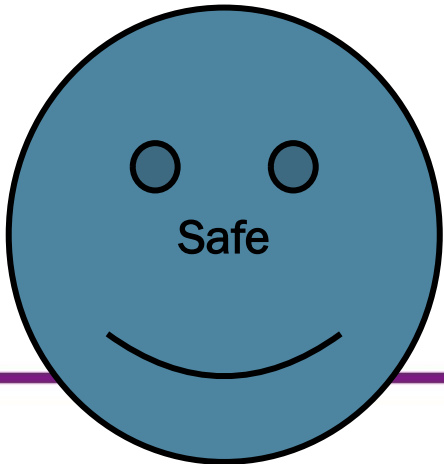
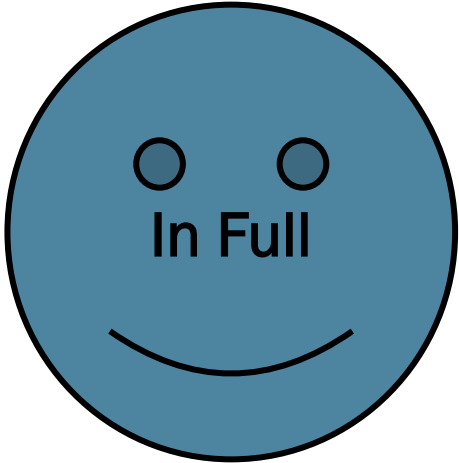


# Just Lipstick





# Still About the Customer





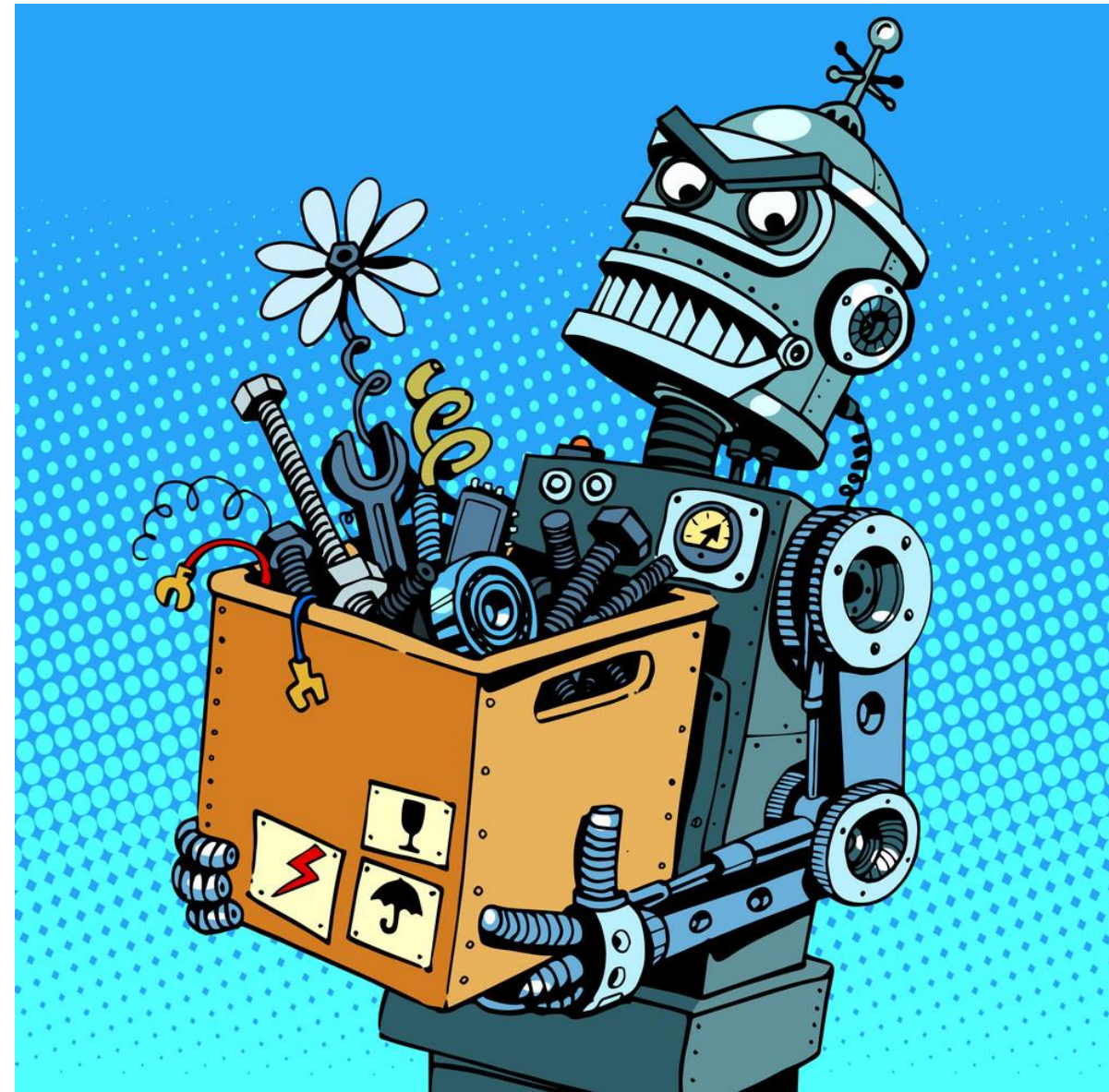


Let's go inside  
your  
warehouse



# Let's Discuss the Future Of:

- Less than full case operations
- Courier & distribution options
- Pallet options
- Automation
- Environmental stuff
- etc





# Ecommerce Changed Warehouses

- Lots picking
- 1 or 2
- Want it now
- **Want to return it**





# Challenges

## Customers want:

- Delivered now
- Big range
- Low price
- Simplicity

## But – complexities:

- Lots inbound suppliers
- Store difficult
- Lots customers
- Pick difficult
- Pack difficult
- Interface difficult
- Lots returns
- Lots redundant stock
- Rely on 3<sup>rd</sup> parties for buy outs
- Complex systems – all processes





**12 million SKU  
+ 350m SKU in marketplace**







# Ecommerce Warehouse

- More Doors
- More Doors
- More Doors

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A delivery person wearing a blue polo shirt is holding a large, plain cardboard box. The person is standing in front of the open back of a white delivery van. The background shows a paved area and some greenery. The text "Delivering 1 at a time is costly" is overlaid on the front of the cardboard box in a dark blue, sans-serif font.

Delivering 1 at a  
time is costly







# What Will We Do With Shopping Centres?







**Is Automation  
the Big Driver**



# Ecommerce = Lots SKU

- Easy access
- Fast access
- Horrible peaks

**OUT OF  
DATE**



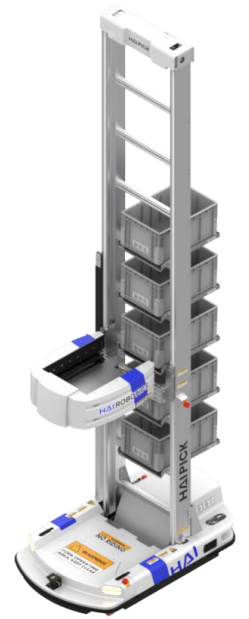


# Example

- [Xtep RoboShuttle System Case Study – YouTube](#)
- <https://www.youtube.com/watch?v=dwAj2EHKoaM&t=14s>



# AMR's – The Future?







# Smalls

Lots of automation options

Miniload / Autostore / Multi-shuttle

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# Options





# Goods to Person

Autostore - <https://www.youtube.com/watch?v=iyVDMp2bL9c>

Miniload - <https://www.youtube.com/watch?v=xkCJOygGj4M>

Multi shuttle - <https://www.youtube.com/watch?v=DAKZTtqCg2E>

Multi shuttle - [https://www.youtube.com/watch?v=RLW\\_ZSR3m2A](https://www.youtube.com/watch?v=RLW_ZSR3m2A)

Kiva - <https://www.youtube.com/watch?v=UtBa9yVZBJM>

Rack climbing robots - <https://www.youtube.com/watch?v=R6Aiw2jVqSU>

Kardex VBM - <https://www.youtube.com/watch?v=4NZYkO8GVzc&t=19s>



# Better Smalls

For most Ecommerce players –  
simple manual processes





# Simpler

- Is it about a better trolley
- Better scanning
- Better training
- More flexibility







Is it Largely About Helping Humans?

Example:

- Voice
- Glasses
- Robots



Ideal For Ecommerce





# Couriers & Sorting





# Still Place For Traditional Automation?

<https://www.youtube.com/watch?v=8vllq9mIL58>

[https://www.youtube.com/watch?v=J8j\\_E0NganU&t=10s](https://www.youtube.com/watch?v=J8j_E0NganU&t=10s)



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[https://www.youtube.com/watch?v=J8j\\_E0NganU&t=53s](https://www.youtube.com/watch?v=J8j_E0NganU&t=53s)













# Pouch Sort – In Tech





# Packing 101



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# Packing – really hard to automate





# Packing – really hard to automate





As many people  
packing as  
picking!





Not ideal for environment





Better





So How did this happen?



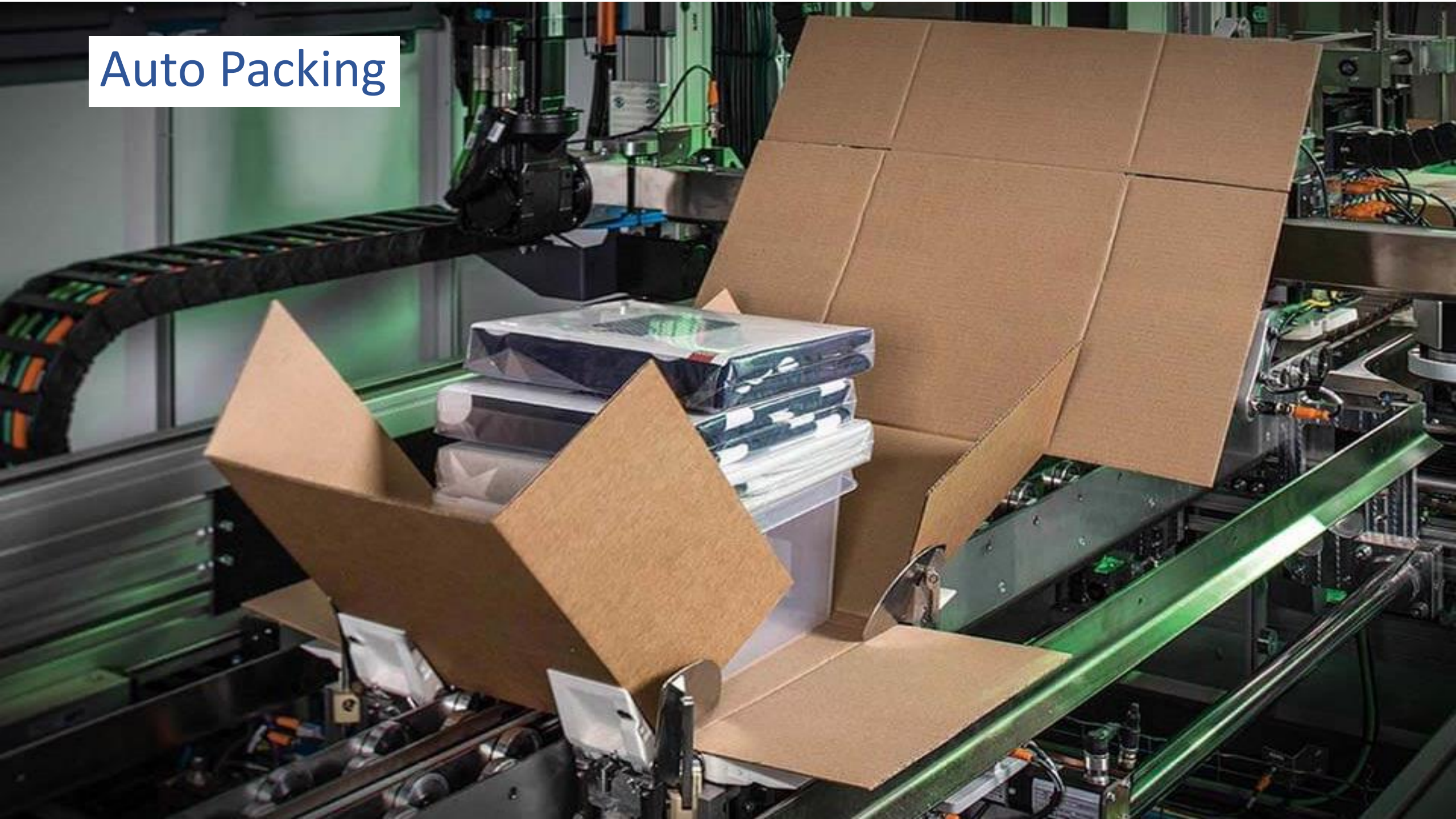


# Box Sizer





# Auto Packing





# Auto Bag Ideal with Pick wall



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# Returnable Packaging?



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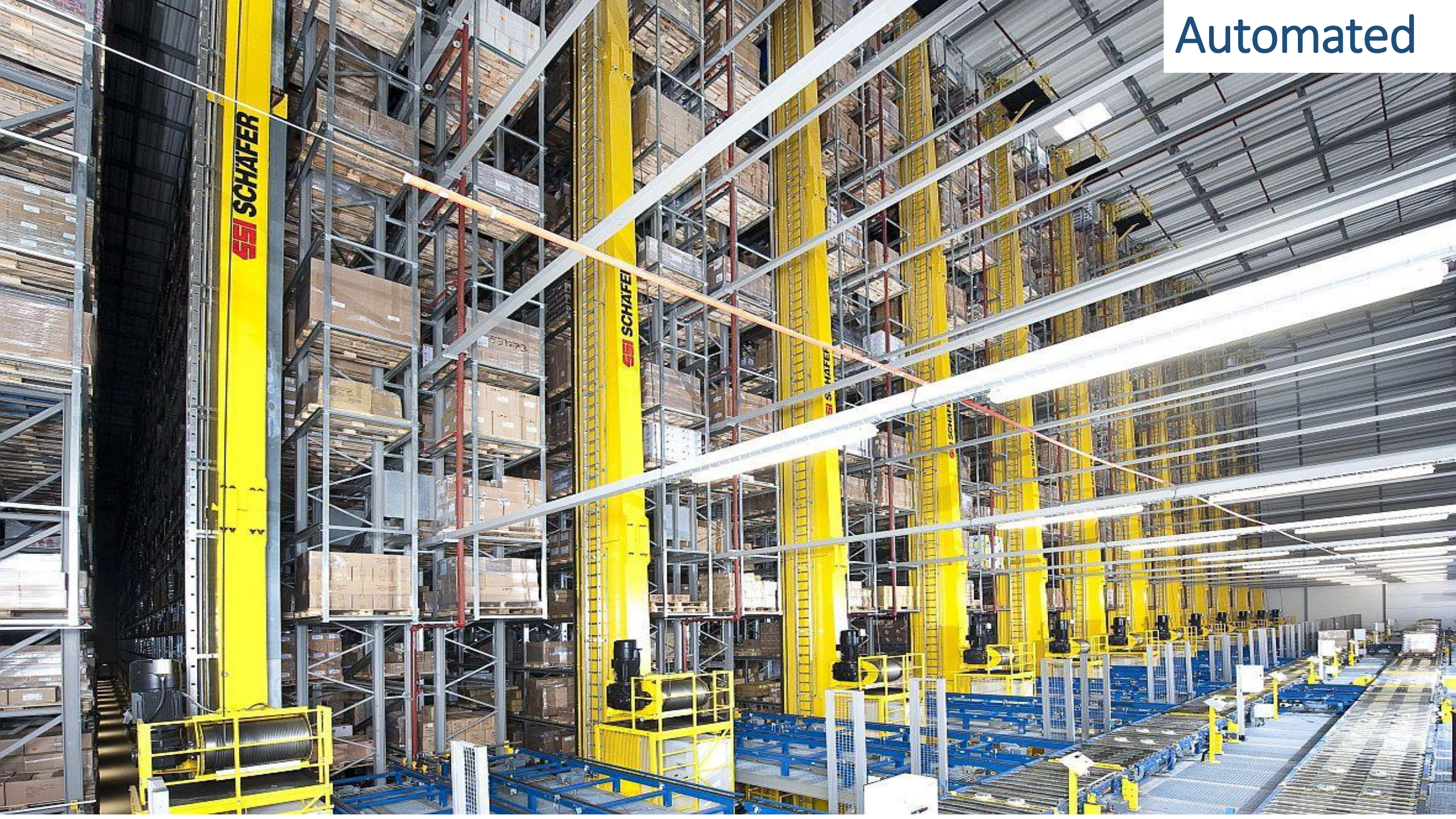
# Pallets 101







Automated



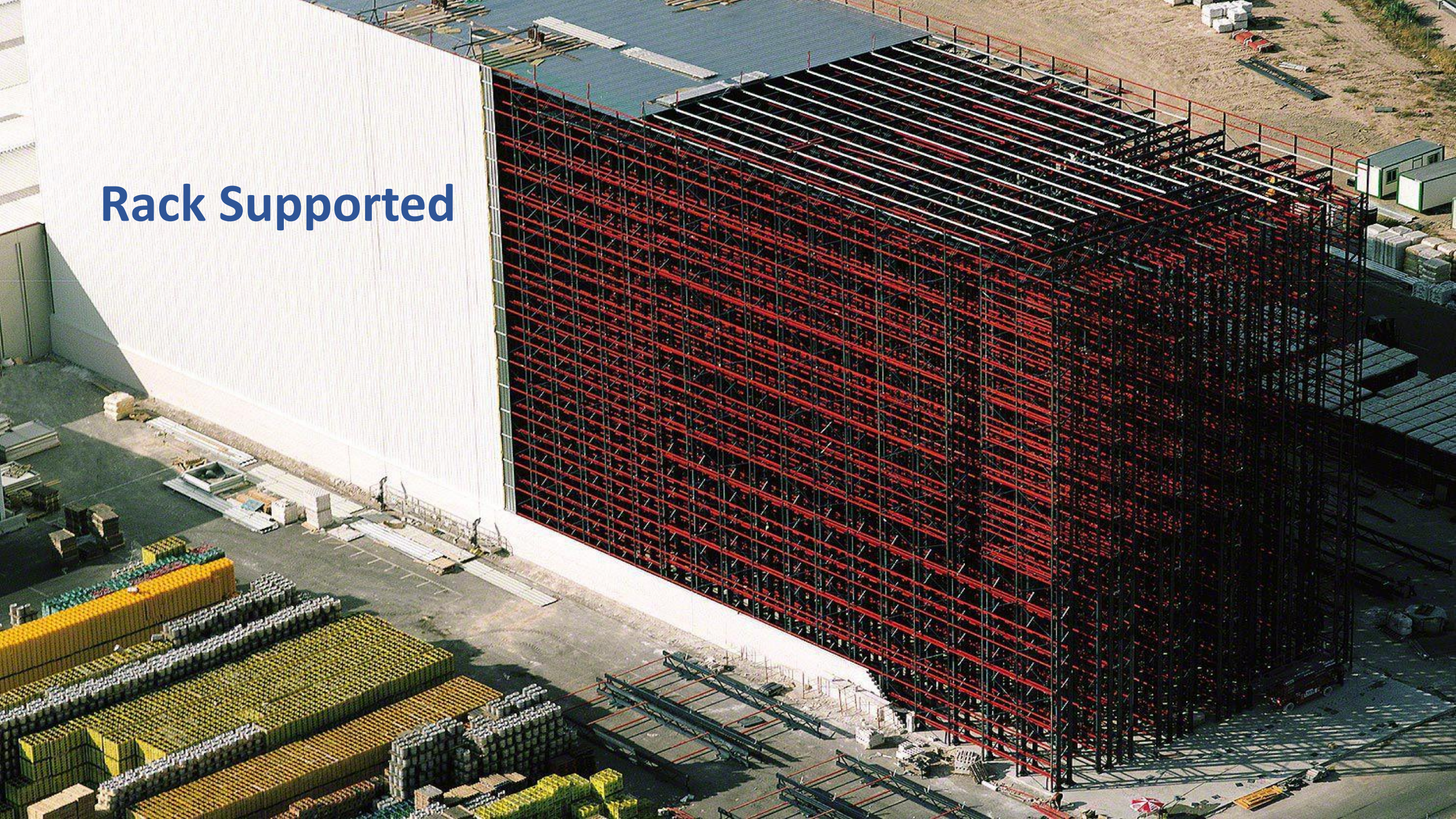


Double deep



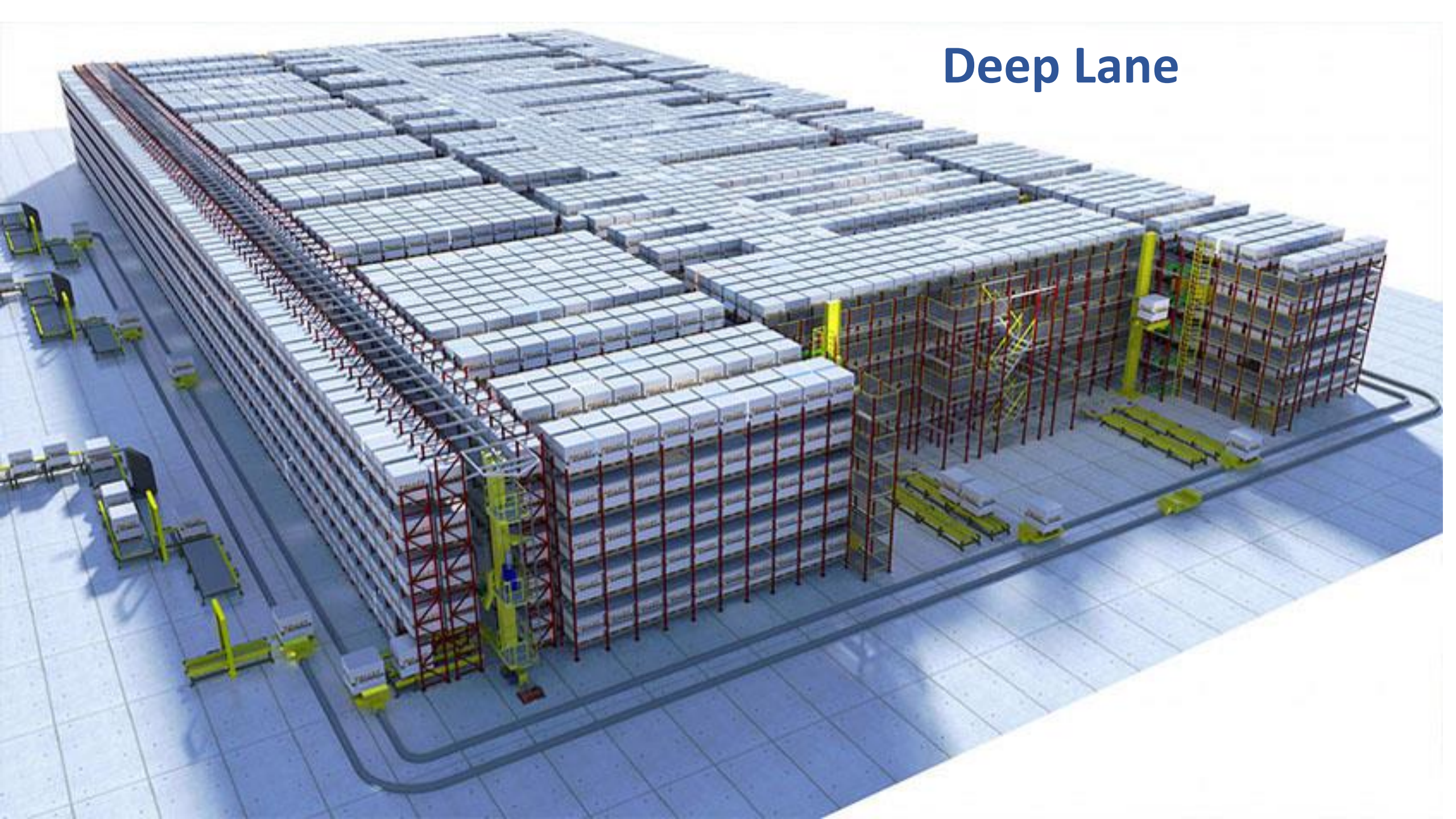


# Rack Supported





# Deep Lane



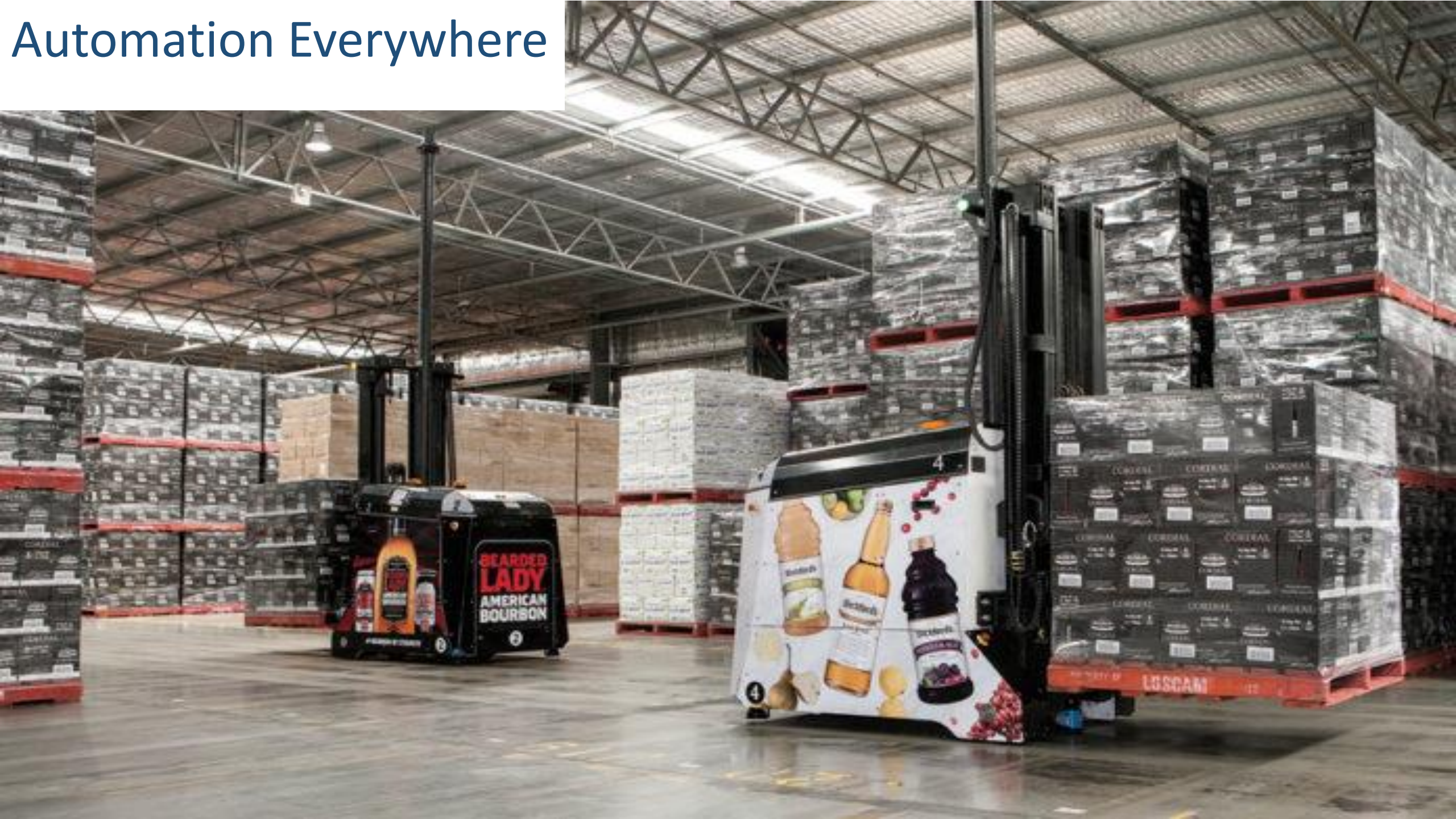


# Automation Everywhere?





# Automation Everywhere







AGV

2 2

AGV

AGV

SYSTEMS

6  
AGV



# AGV 101





# VNA 101











BEACON

VBL

384

805

MSC

691

TYVALS

855

769



854

837

514

852



Back to  
Helping  
Humans  
Glasses







From Loc: CD050AC

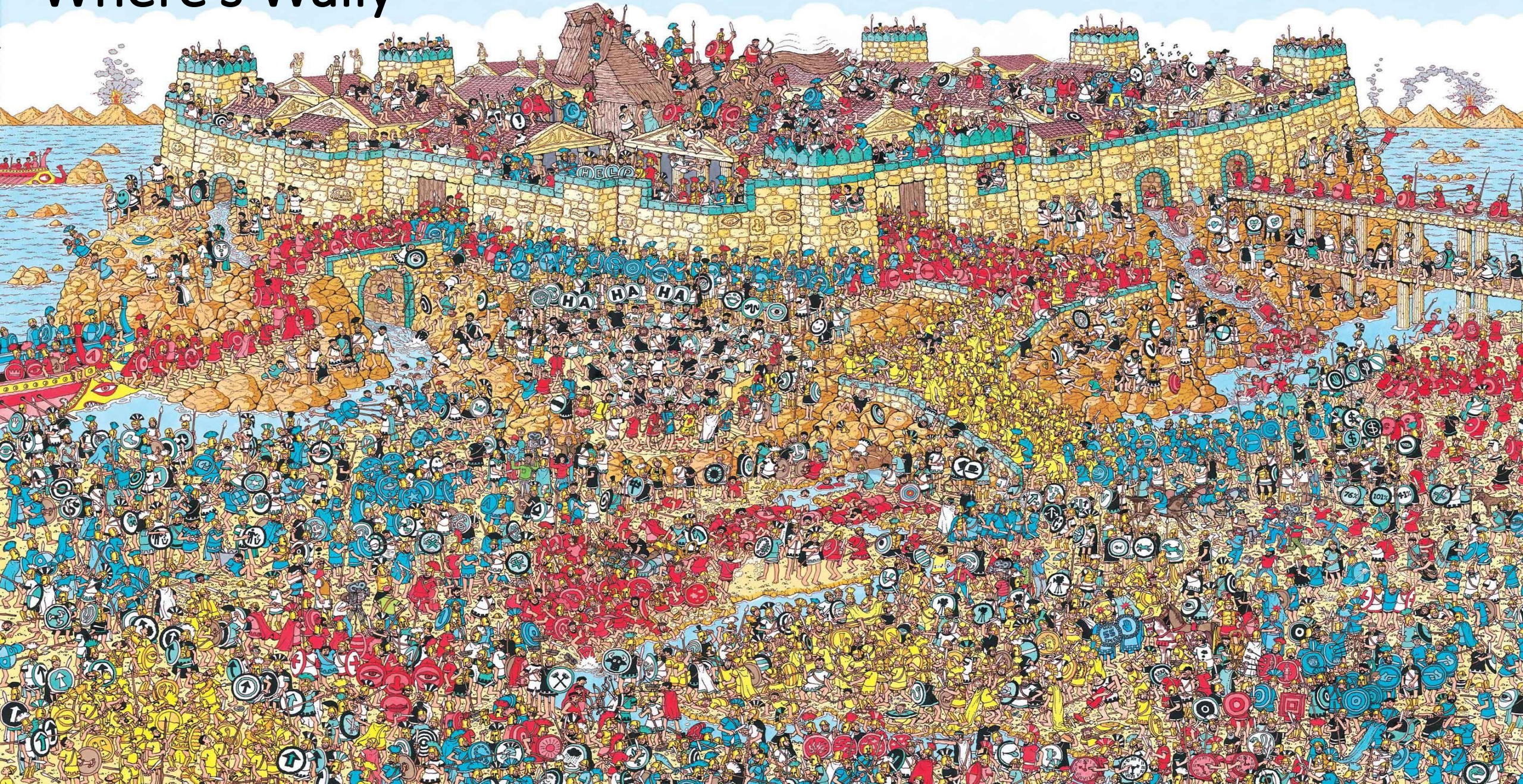
Pick Qty: 4

Part: 8264

Augmented  
reality



# Where's Wally



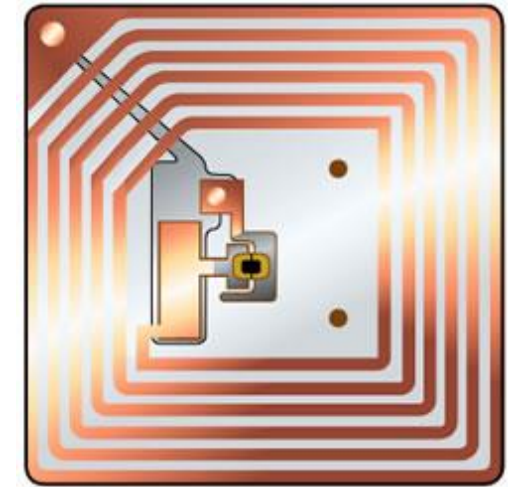




The Dream Is a Magic wand That Tells Us Where Everything is Hiding



# Checking & Verification – Where Are We Going?





**Just To Find Stuff?**

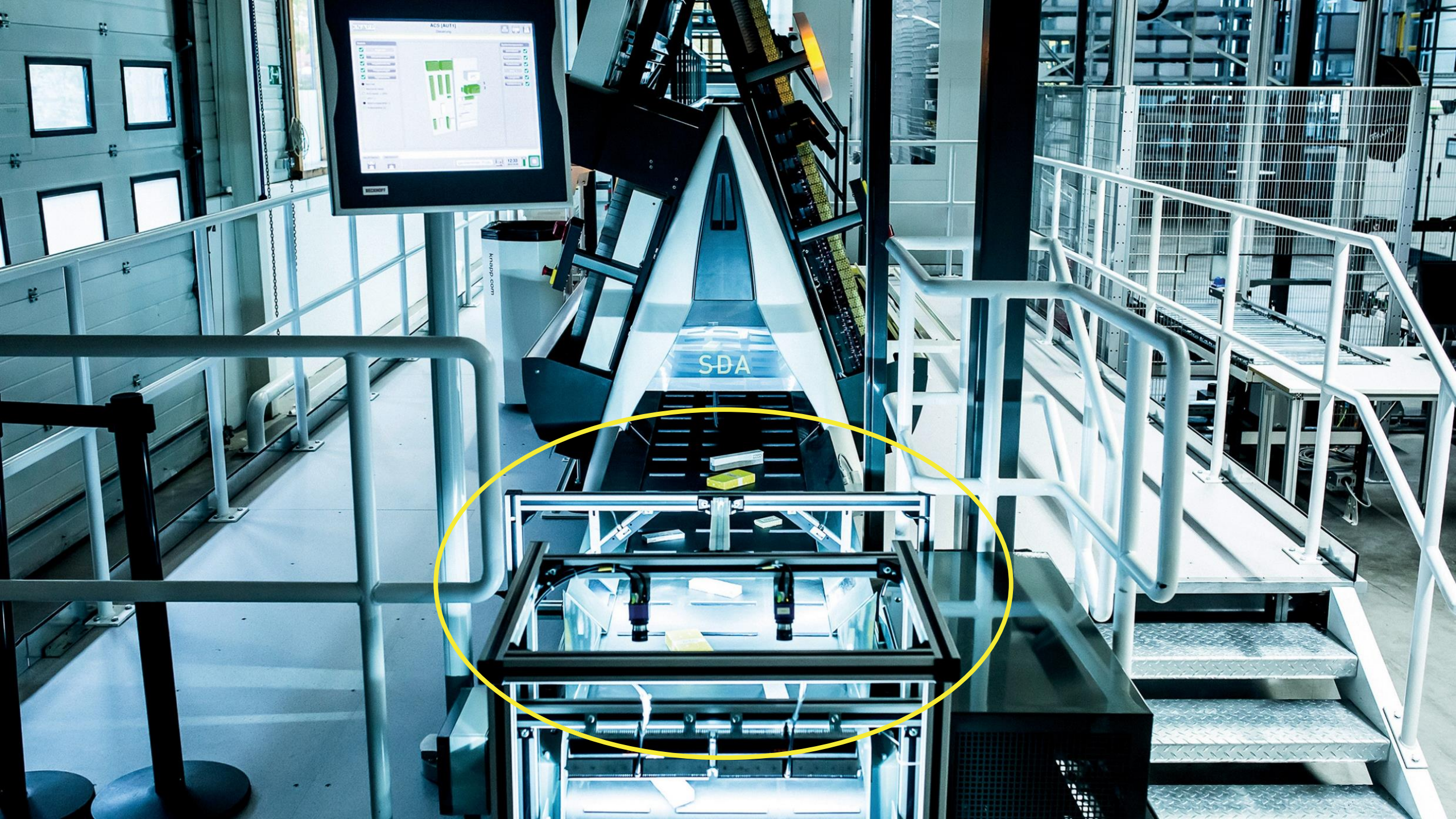




# Auto Checking

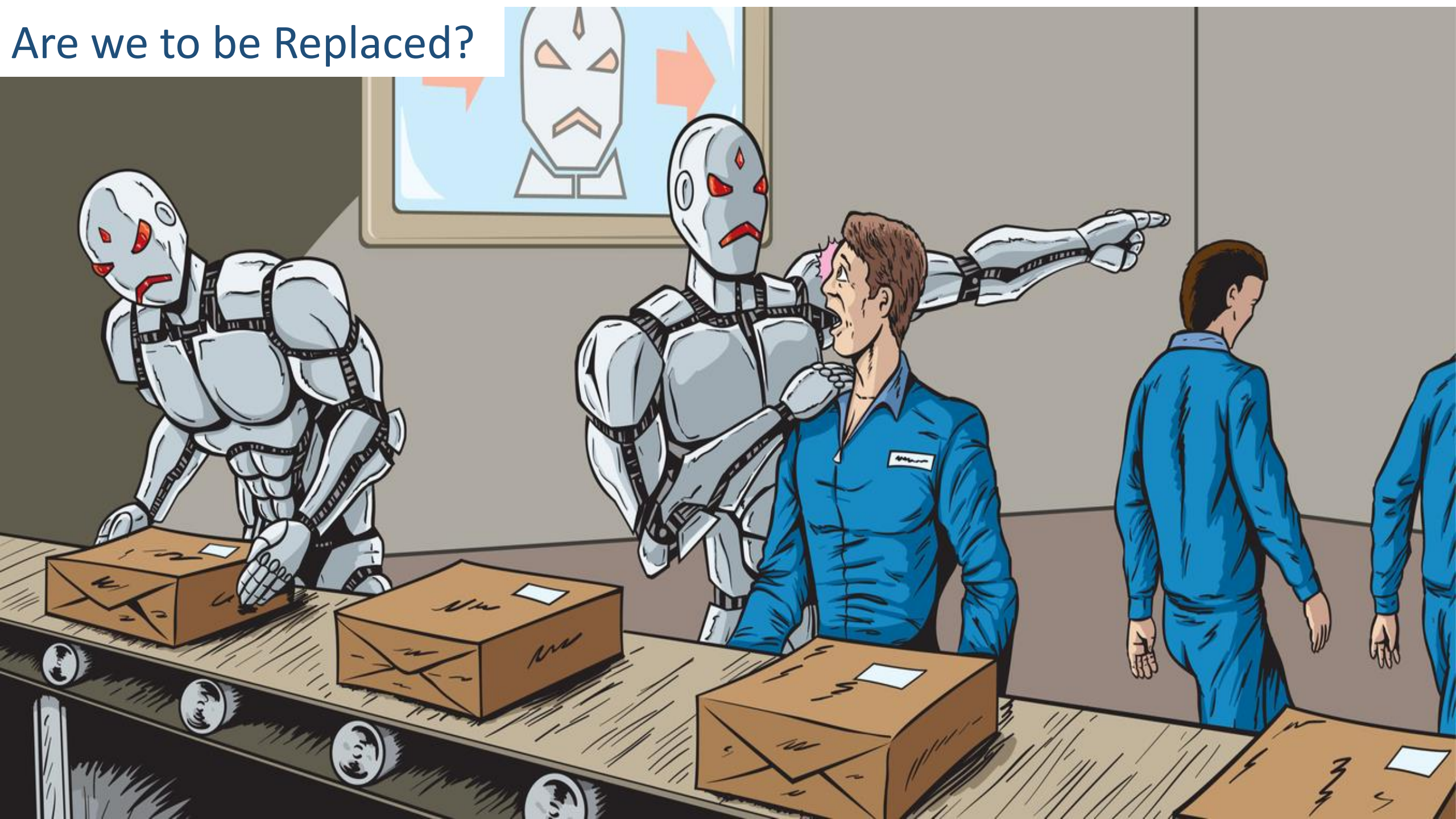








Are we to be Replaced?









# Finding Someone You Trust to Build Your Automation

- Local
- International
- Support
- On time
- Up time





# Maintaining 101







Keeping It Working







Reverse is True?





# Maintenance Help – Early Days





Now



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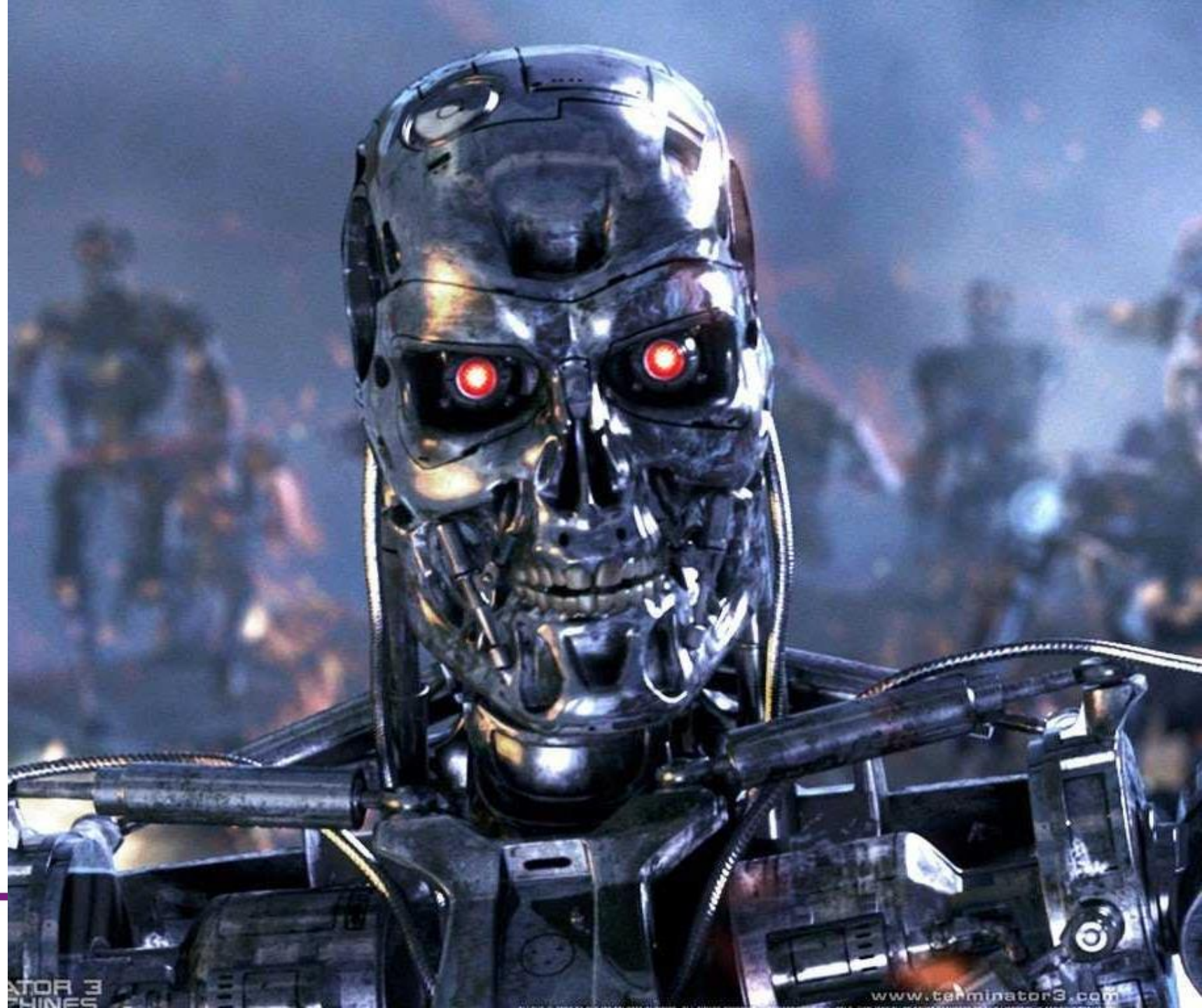


# Does Automation Create Unemployment?

- More automation =
- More competitive =
- More business =
- More growth =
- More jobs for:
  - Your company
  - Your country

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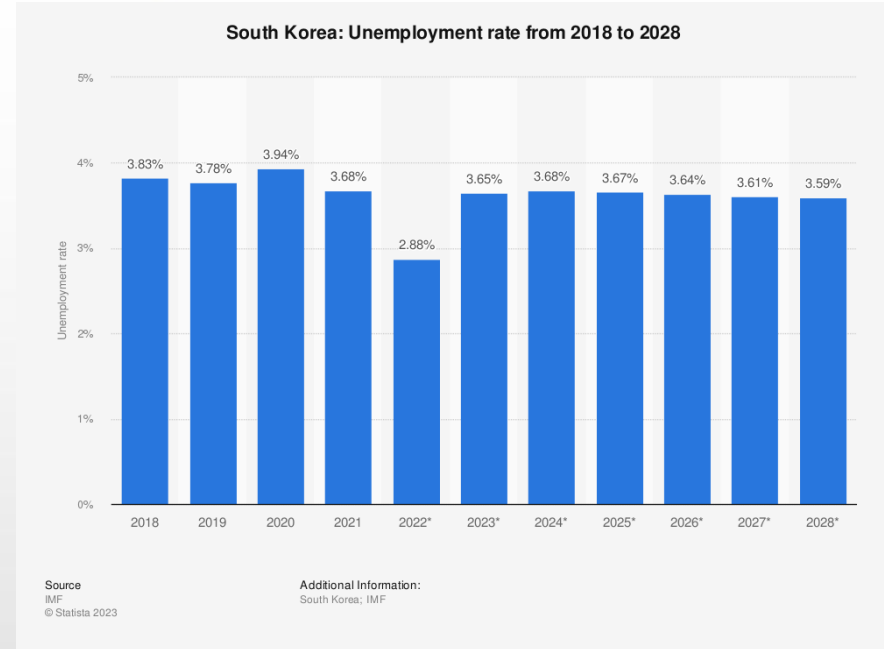
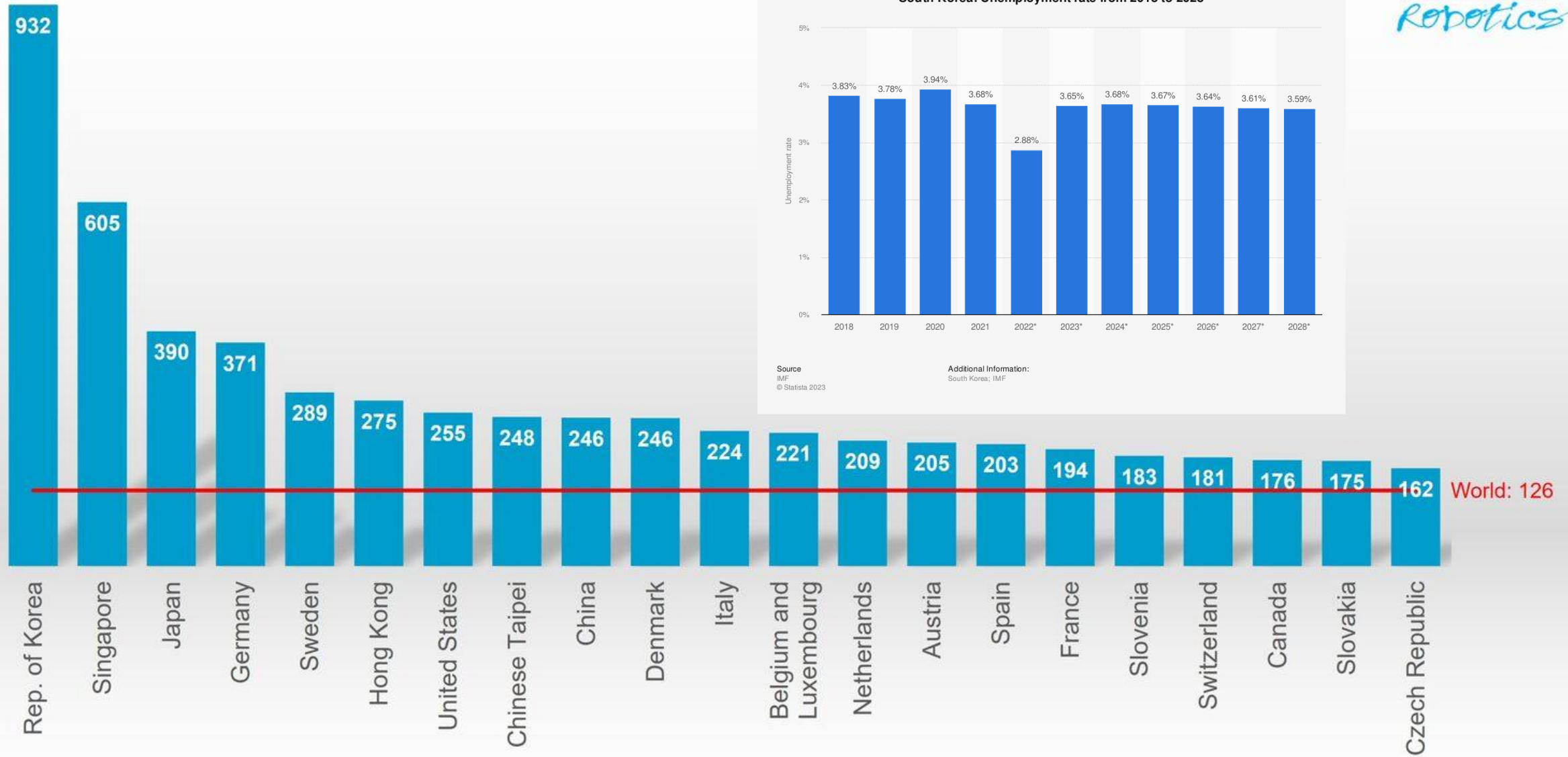
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# Robot density in the manufacturing industry 2020

robots installed per 10,000 employees



Source: IMF © Statista 2023  
 Additional Information: South Korea; IMF



# Lots New Tech – Has Complexities

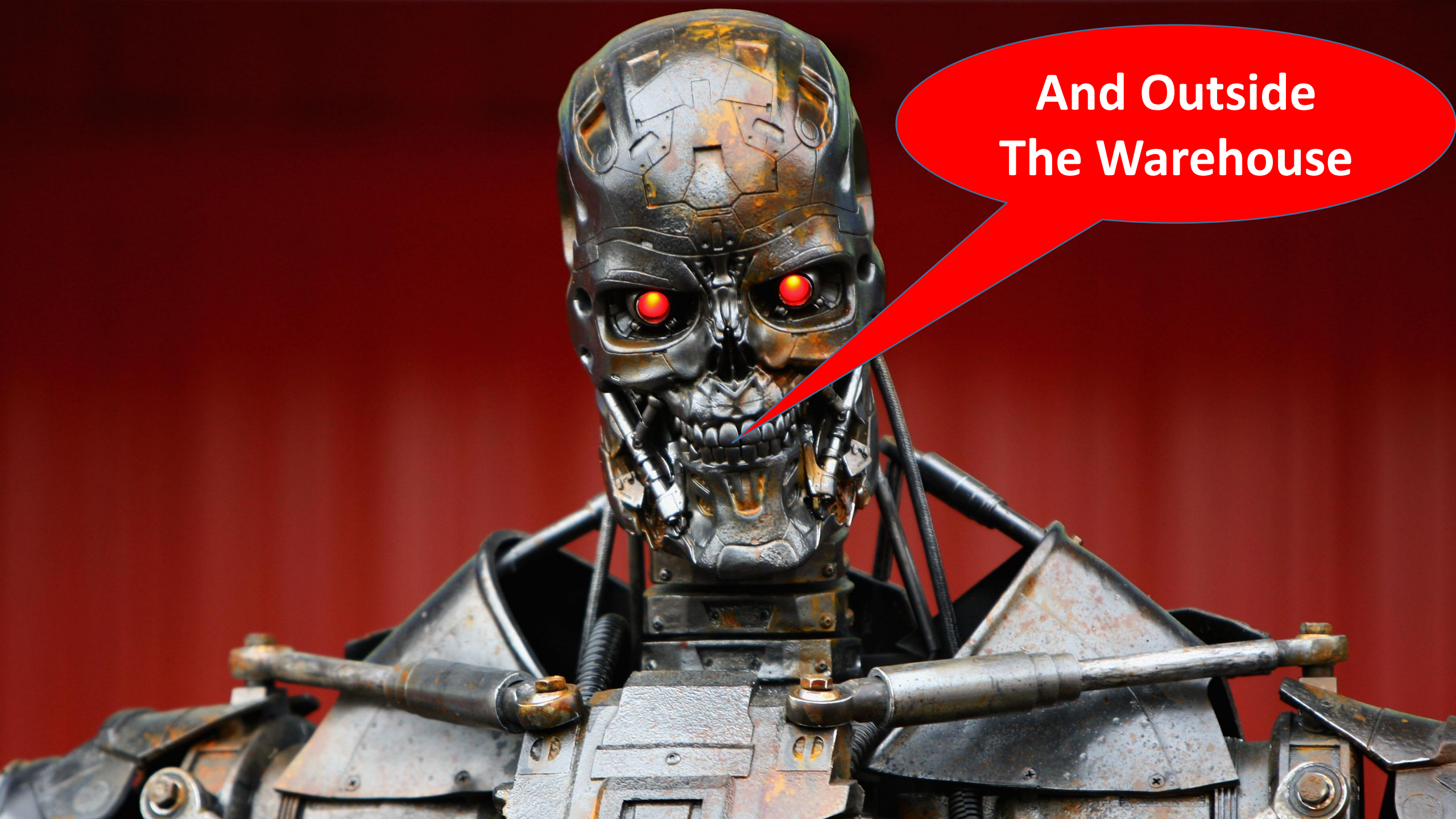




Better?  
Faster?  
Simpler?



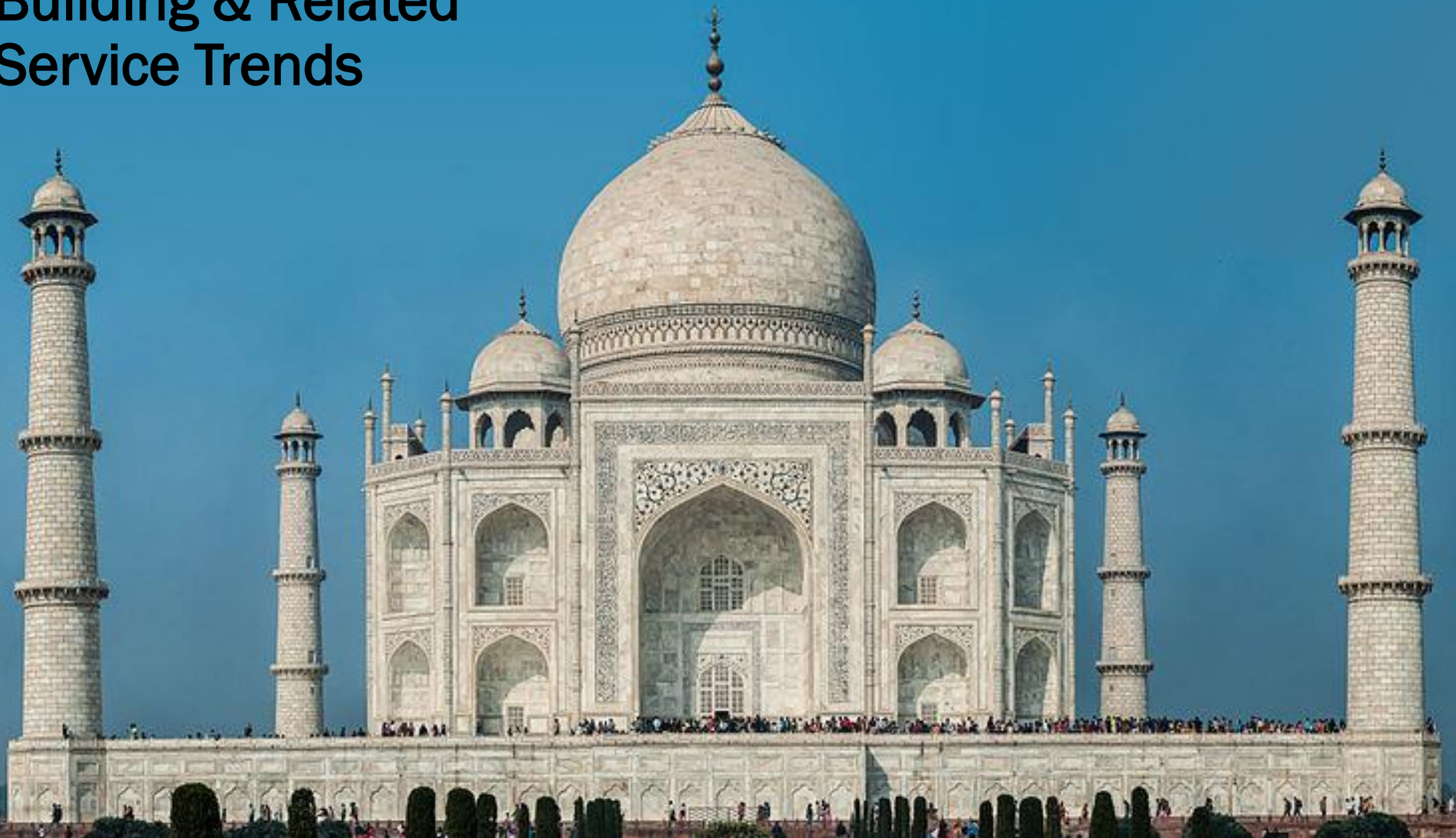




**And Outside  
The Warehouse**



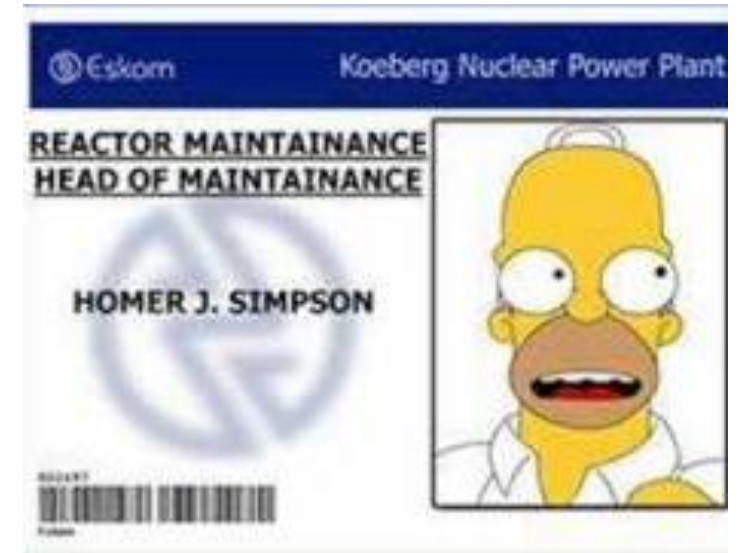
# Building & Related Service Trends





# Infrastructure Degradation & Your Warehouse

- Eskom
- Transnet
- Post office
- Roads
- Water
- Sewerage
- Fire
- Services
- Planning







**Nike (Belgium)**





Nice Place to Work



# Green Stuff





# Will All Our Warehouses Need to Look Like This?







Got  
Spare  
Land?





**And batteries**











And These





# Lighting





Roof, Rain Water Recovery, etc, etc





# ZERO WASTE

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A lush, dense tropical rainforest scene. The foreground and midground are filled with a variety of green plants, including large palm-like leaves and smaller, broad-leafed species. Several thick, dark tree trunks are visible, some leaning at angles. The background is a soft-focus wall of green, suggesting a deep forest. The overall lighting is bright and natural, highlighting the vibrant colors of the vegetation.

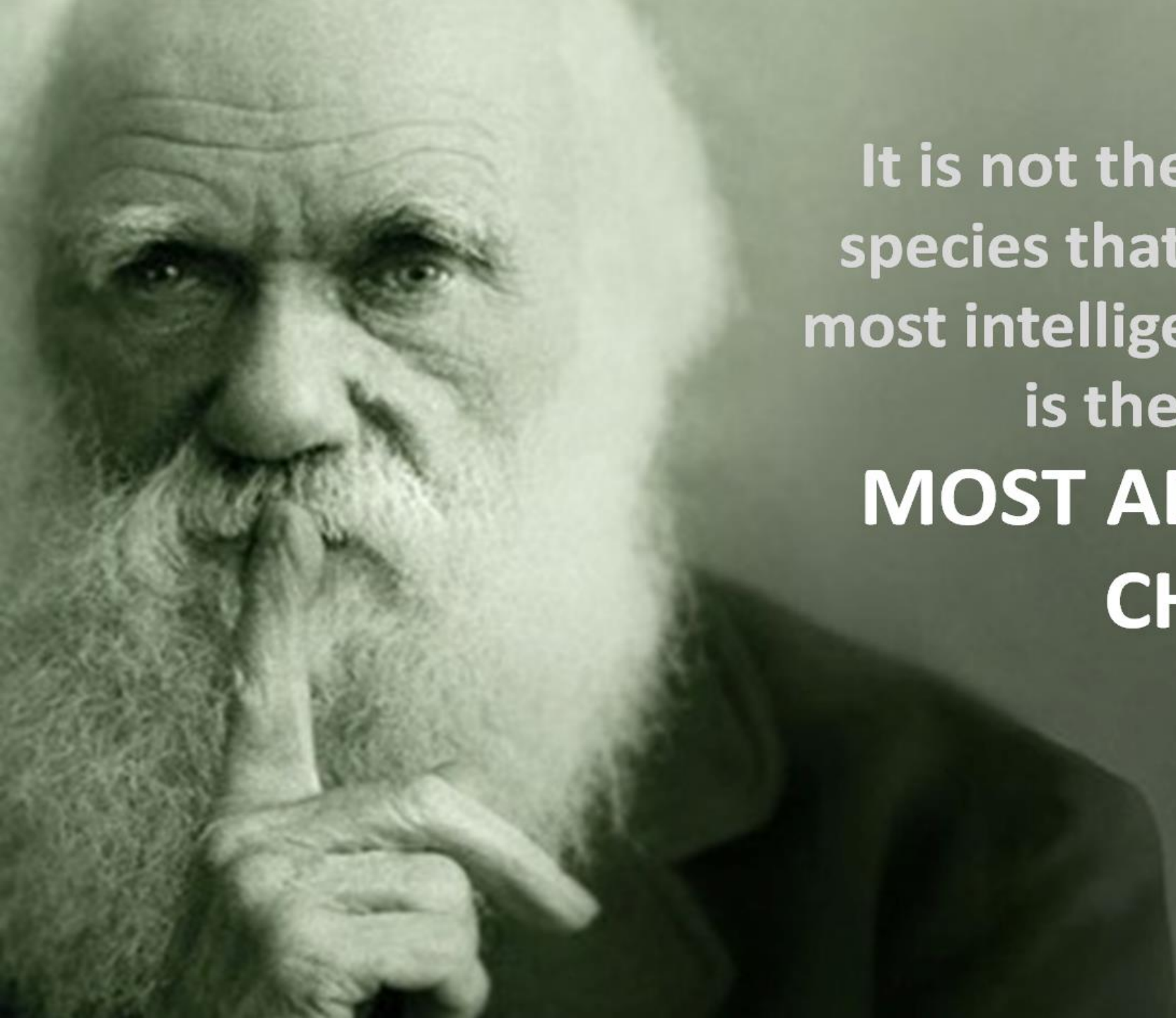
## Net Zero Carbon Offset Projects





Tomorrow?





It is not the strongest of the  
species that survives, nor the  
most intelligent that survives. It  
is the one that is  
**MOST ADAPTABLE TO  
CHANGE**



**Thank You &  
Welcome To Your  
New Warehouse**

