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Automation and the Future of Property Management

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#IREMforward

Agenda

- What is Automation?
- 3 Waves of Robotics
- Affect on Commercial Real Estate
- Impact of Automation – Is this Time Different?

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What is Automation?

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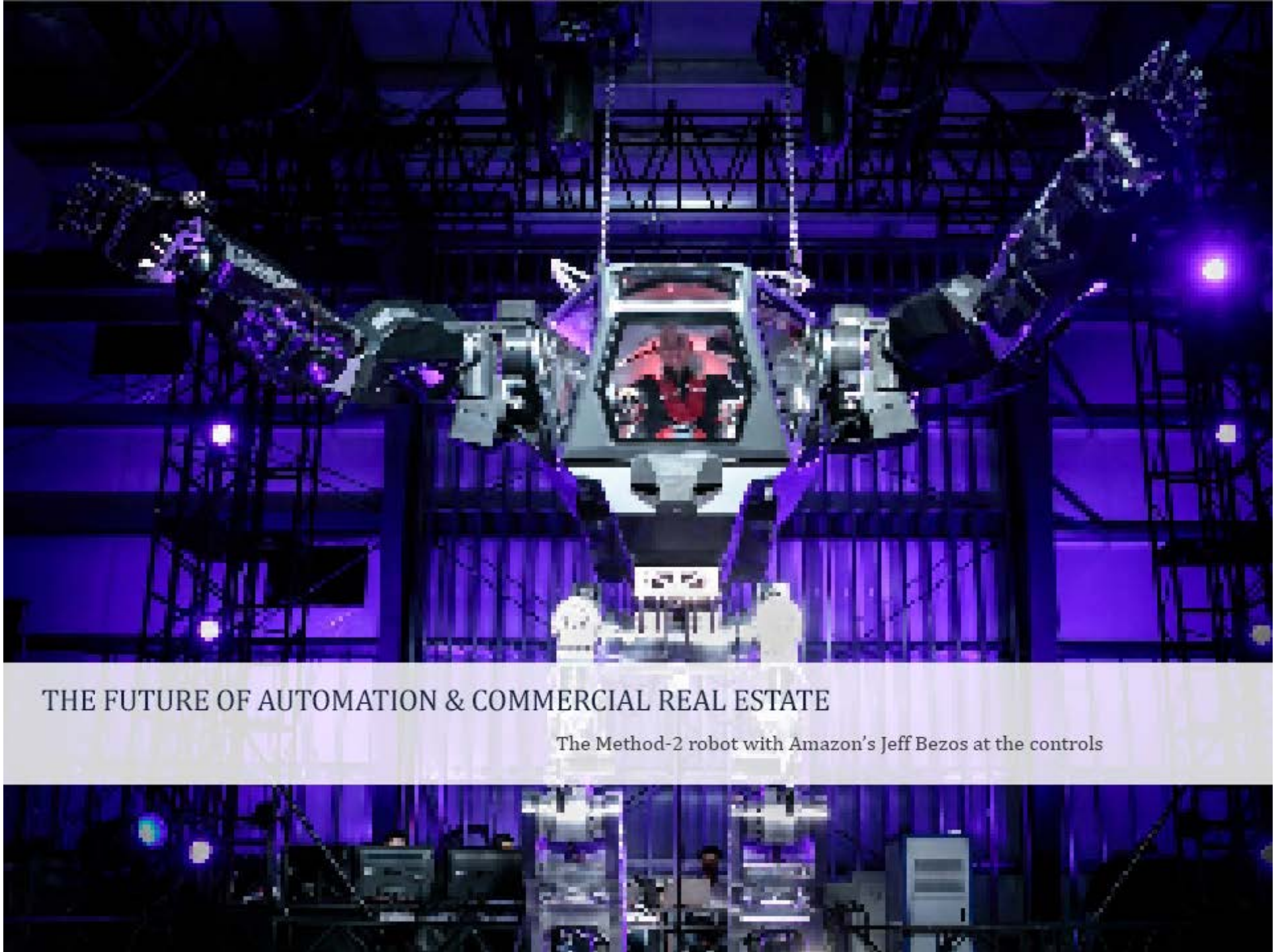

THE FUTURE OF AUTOMATION & COMMERCIAL REAL ESTATE

The Method-2 robot with Amazon's Jeff Bezos at the controls

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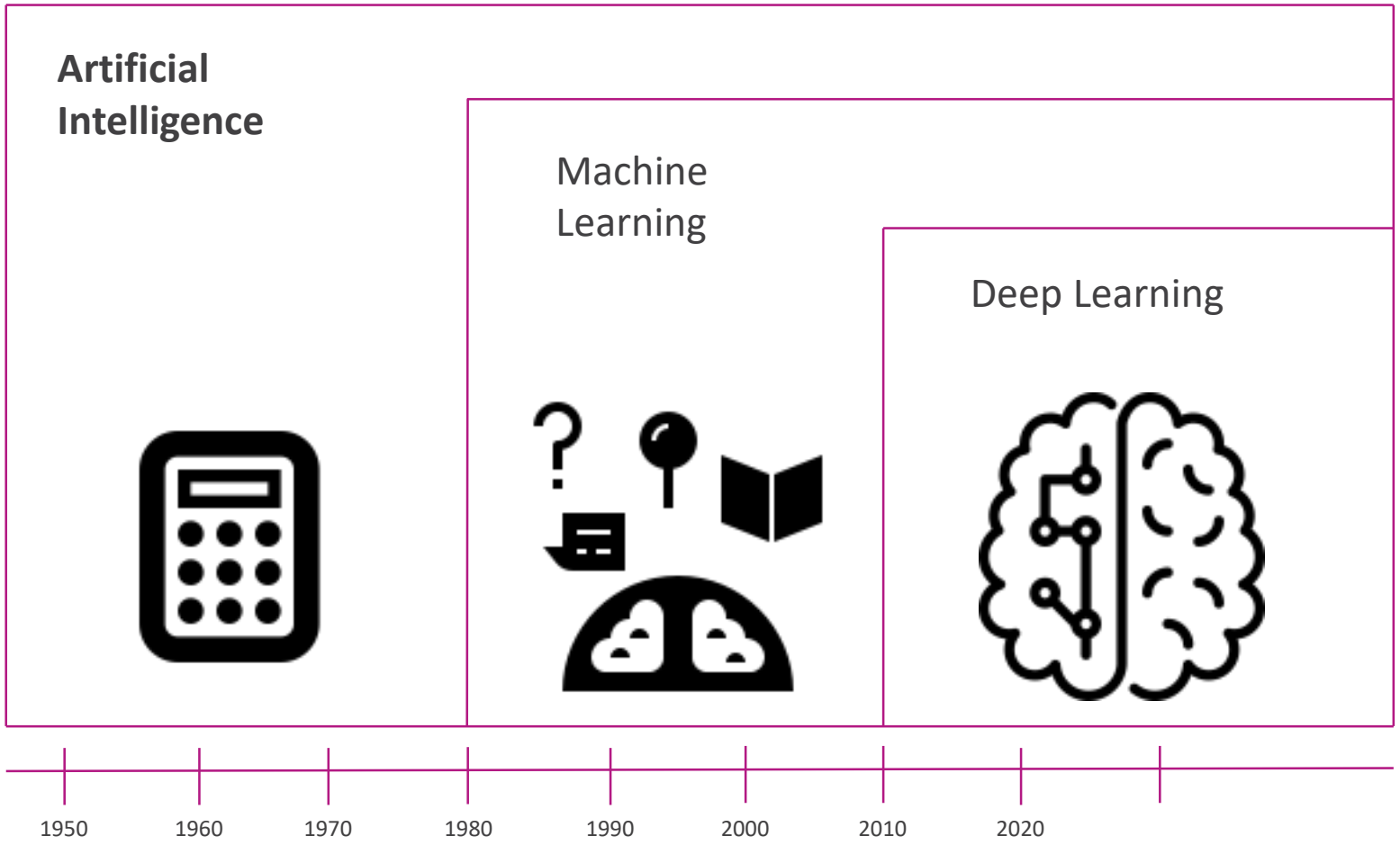
What Is Automation?

Robotics	Machine Learning	Artificial Intelligence

Images courtesy of iStock

The Evolution of Automation



Since the 1950's, smaller subsets of artificial intelligence – first machine learning, then deep learning – have created ever larger disruptions.

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Machine Learning

Quiz

3…… 9
4…….16
7…….49
9……??

Did you guess
<u>81??</u>

Deep Learning

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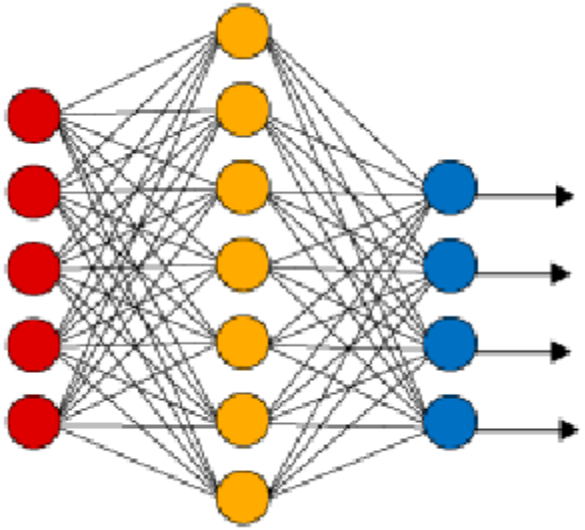
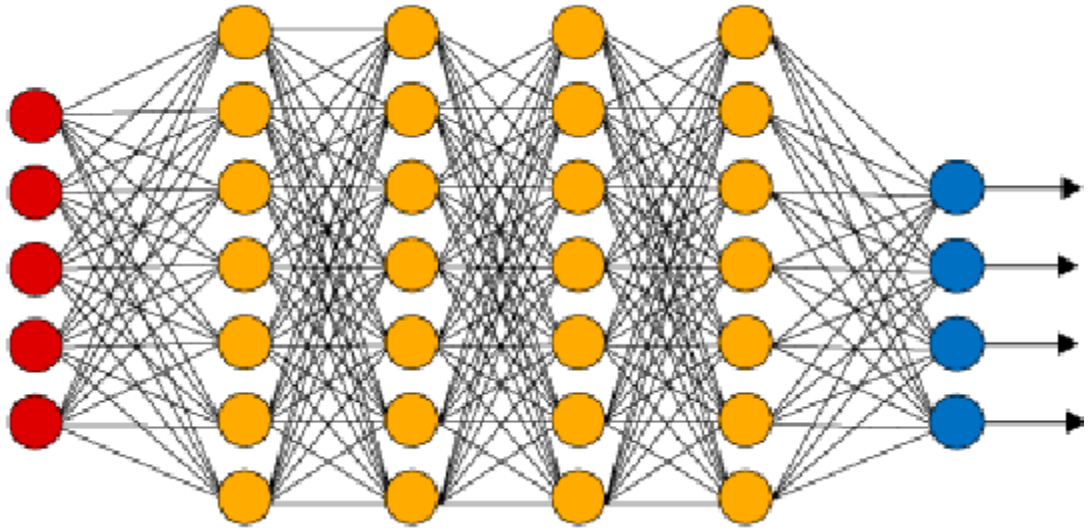
Simple Neural Network



Deep Learning Neural Network



Input Layer

Hidden Layer

Output Layer

Images courtesy of becominghuman.ai

3 Waves of Robotics

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1. Structured Manipulation

The Beginning …

The first Industrial Robots:

- Precision robots; cannot cope with uncertainty

The emergence of Artificial Intelligence

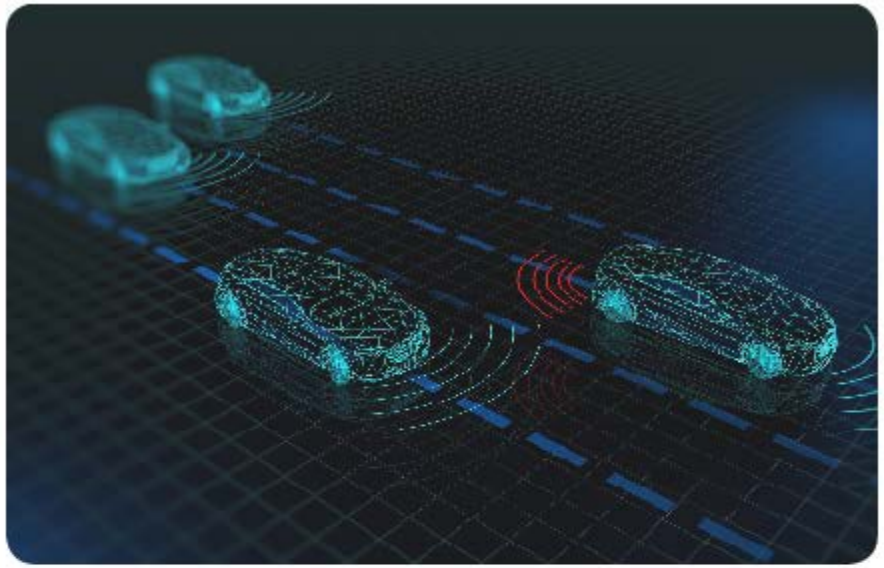
- Machines beating humans at chess or Jeopardy; games which could only be won by intelligent people, has created more possibilities

- However it was the perceived less difficult tasks of humans (walking, seeing, making a drink) which have been far harder to automate.

2. Unstructured Mobility
Where We Are At Present …

Self driving cars - LIDAR

Domestic Robots
- vacuums that map their environment



Robots have had a break through with perception
BUT
don't have COGNITION

Can't think ahead in complex ways

Example - Robotic maid:
If you take it out of the box in the living room and ask it to go clean the kitchen, it does not know where the kitchen is

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3. Unstructured Manipulation

The Future …

- The ability to automate anything humans can do.

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How Is Automation Going To Affect Commercial Real Estate?

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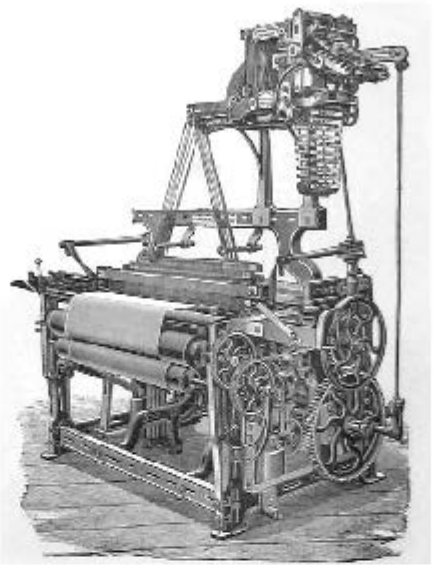
Not a New Phenomenon

- Industrial Revolution

The Weaving Loom
(the end of the
seamstress)



The Combine Harvester
(the end of farm laborers)

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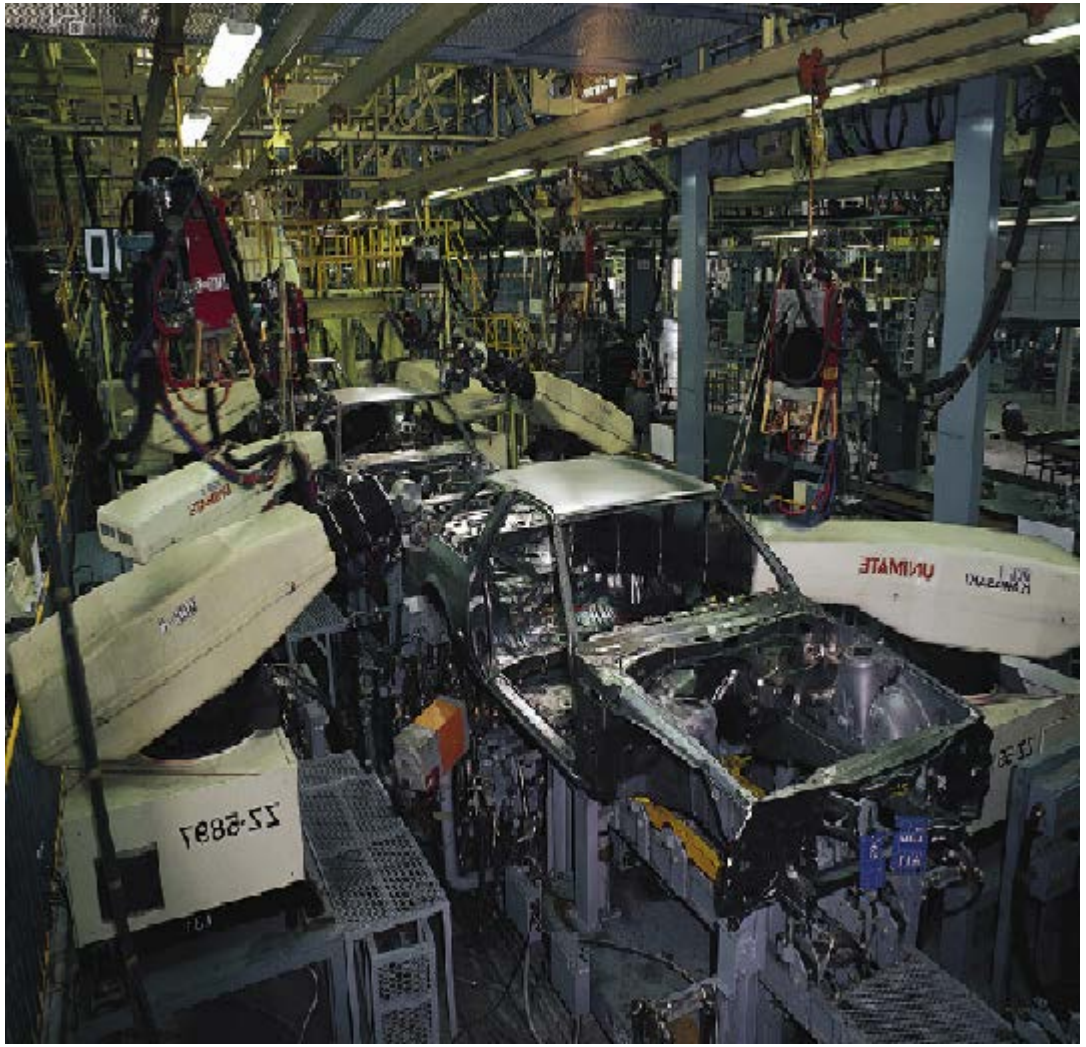
Not a New Phenomenon

- Computer Revolution



- The personal computer
- The robotic assembly line

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Automation In Real Estate

1. The WAY we use buildings
2. WHO is using these buildings
3. The CONSTRUCTION of buildings

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The Construction of a Building

- The Use of Robotic Bricklaying

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3D Printed Construction

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For now……

Images courtesy of Ekso Bionics

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The Way we use Buildings

The Emergence of Smart Buildings

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Using Data and Sensors to create Smart Building Systems

Lighting

Maintenance Management

24/7 Monitoring

Video Security

Fire Control

Energy Management

Elevators

HVAC Sensors

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Effect of Autonomous Vehicles - Repurposing of Parking Structures

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Who will be using these Buildings?

What jobs will be affected?

How long before the jobs are gone?

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AMAZON WAREHOUSE

Images courtesy of YouTube

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Employment Matrix

- Consumer products and Services

	Routine	Non-Routine
Manual	Manual Routine Assembly Line Workers	Manual Non-Routine Jobs in Health Care
Cognitive	Cognitive Routine Keeping Track of Inventory	Cognitive Non-Routine Creating a new Ad Campaign

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Impact of Automation

Is this Time Different?

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Arguments FOR and AGAINST Automation

"Expert commentators tend to overstate the extent of machine substitution for human labor and ignore the strong complementarities between automation and labor that increase productivity, raise earnings and augment demand for labor."

- David Autor – MIT Economist

- "Reverse Luddite Fallacy" Callum Chase
- Based on the old argument that Machines create more jobs than they displace.

Arguments FOR Automation

- Example: ATM – 1970's
- Employees at banks fell from 20 to 13 per branch (1988 through to 2004)
- Reduced the running costs allowing banks to open more branches
- Number of urban branches rose by 43% over the same period

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Arguments AGAINT Automation

- Oxford Martin School Report -September 2013
- Frey and Osborne
- Report assessed the likelihood of robots and other technologies replacing humans
- Concluded that of 702 categories examined, 47% susceptible to automation over the next 20 years

OXFORD MARTIN SCHOOL

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Today’s Employers

GOOGLE

- $600B Valuation
- Est: 1998
- 60,000 Employees

FACEBOOK

- $400B Valuation
- Est: 2004
- 13,000 Employees

WHATSAPP

- $22B Valuation
- Est: 2009
- 55 Emplyoees (at sale)

INSTAGRAM

- $1B Valuation
- Est: 2009
- 13 Employees (at sale)

GENERAL MOTORS

- Est: 1908
- 1978 - >800,000 employees

- Today - $49B Valuation
- 1/9th the valuation of Facebook
- 250,000 Employees (Post Watson)

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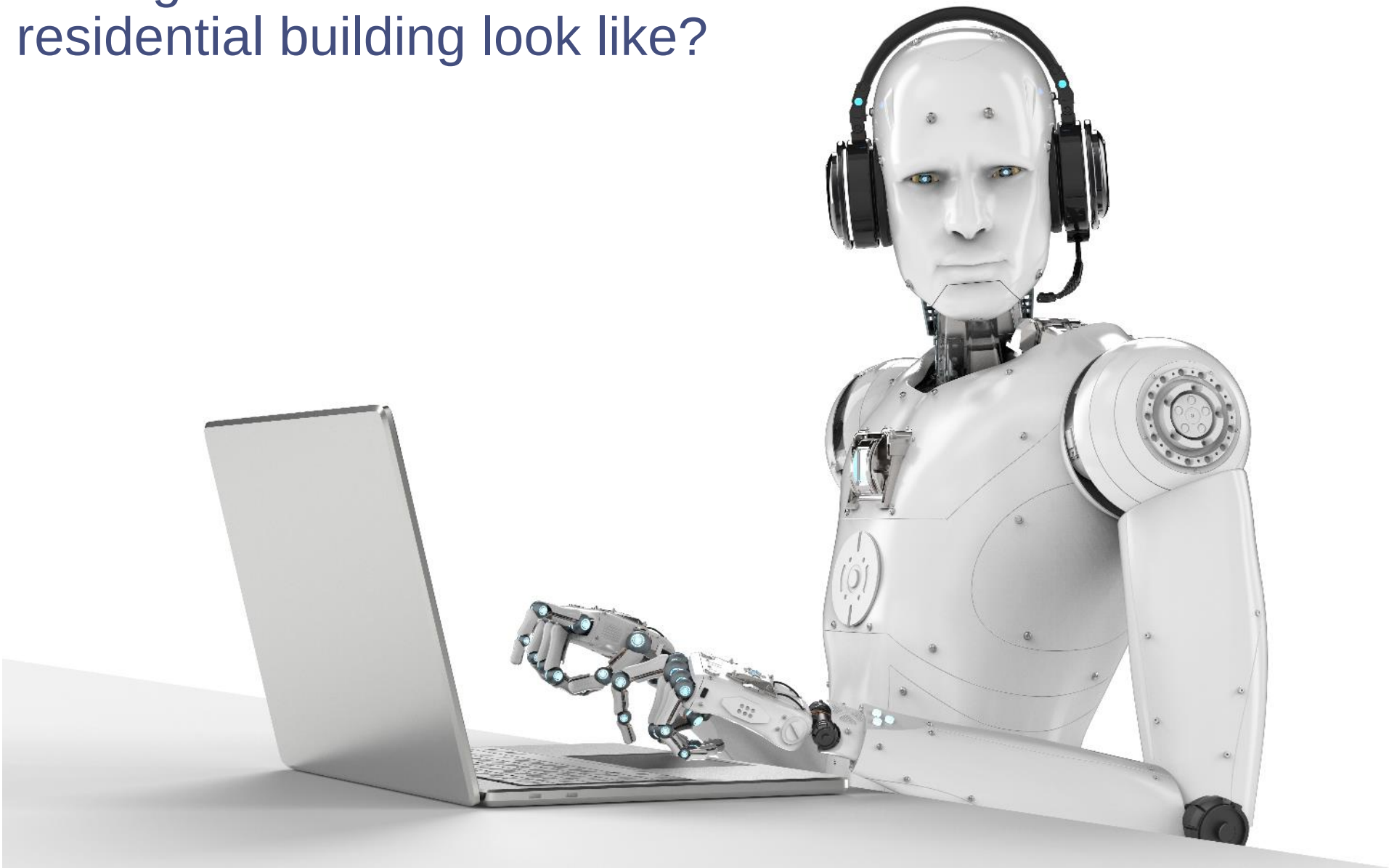
What does a future property manager for a commercial or residential building look like?



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Thank You

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