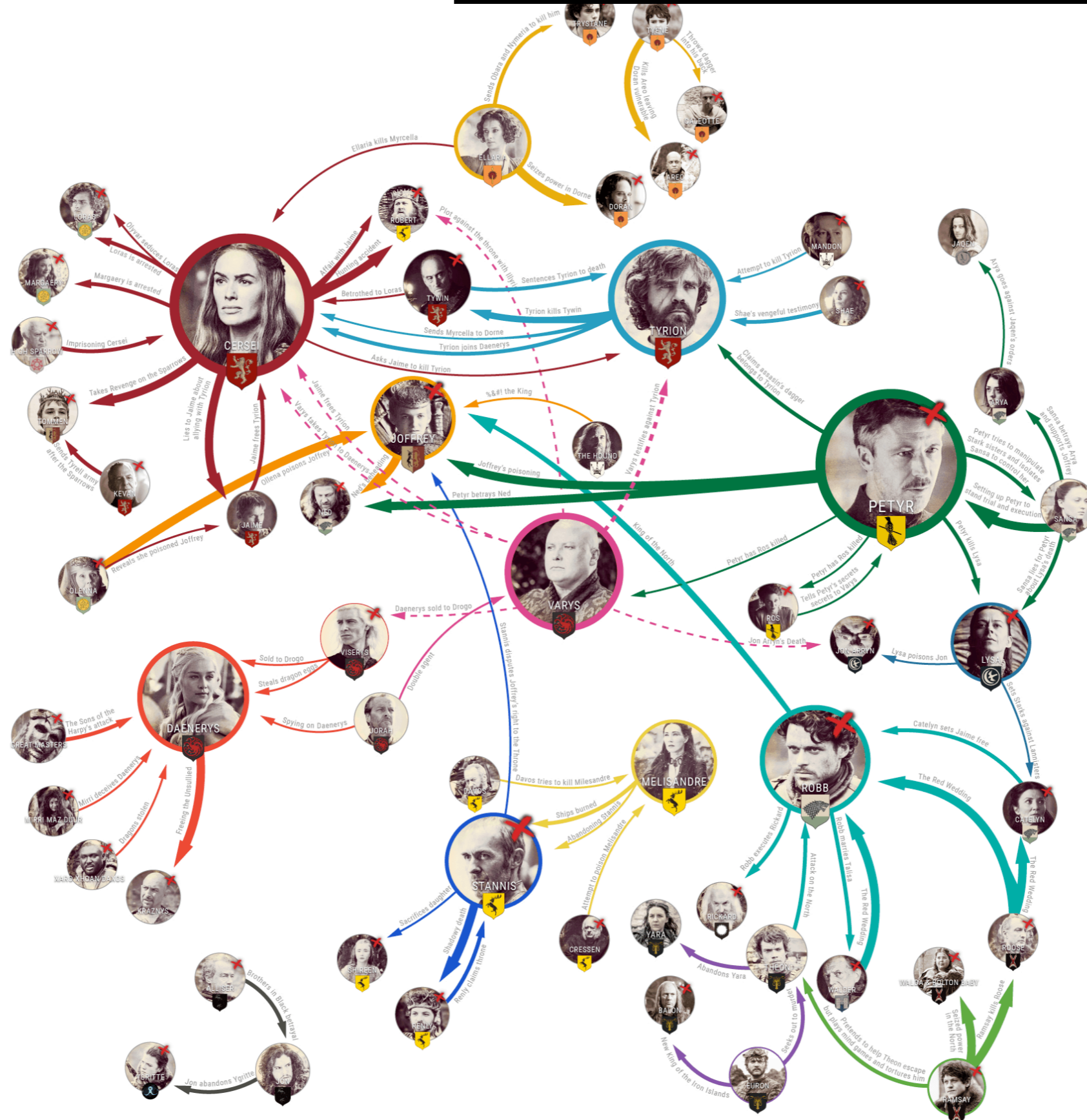


# Workplace Automation & Labor:

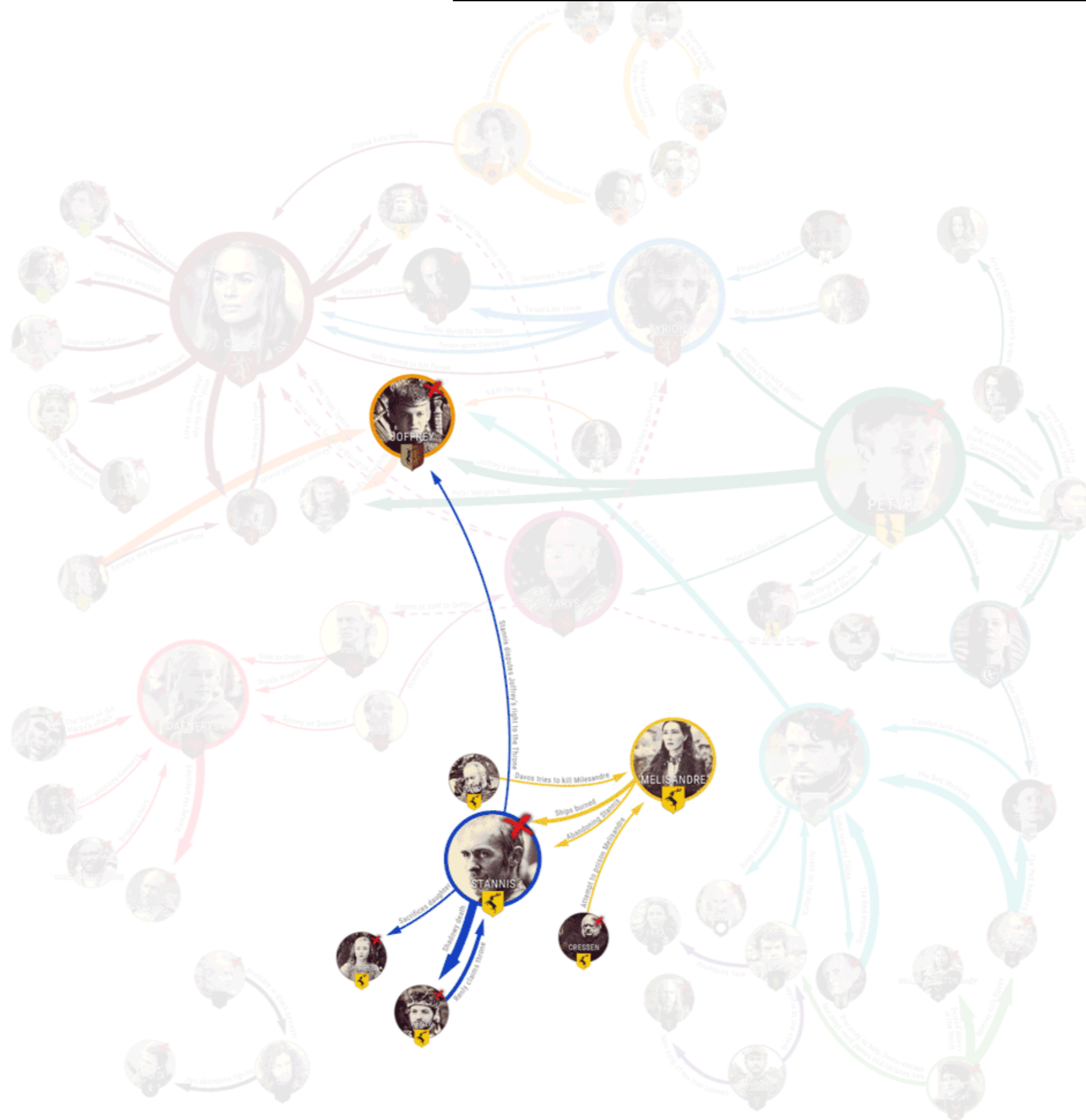
## The **Role** of **Robots** and **Researchers**

Hee Rin Lee, Ph.D.  
Assistant Professor  
Media & Information  
Michigan State University

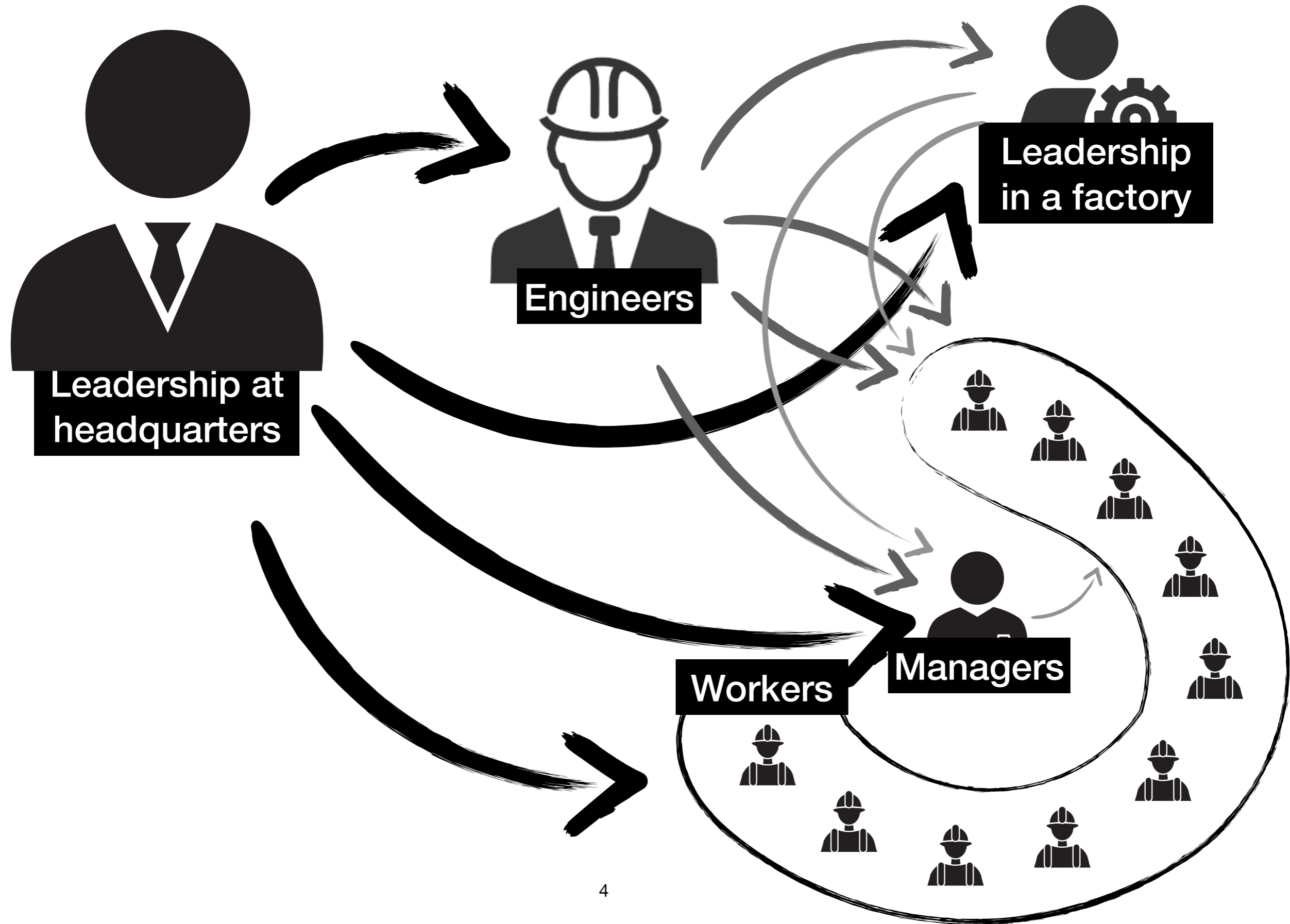
# Power dynamics in Game of Thrones



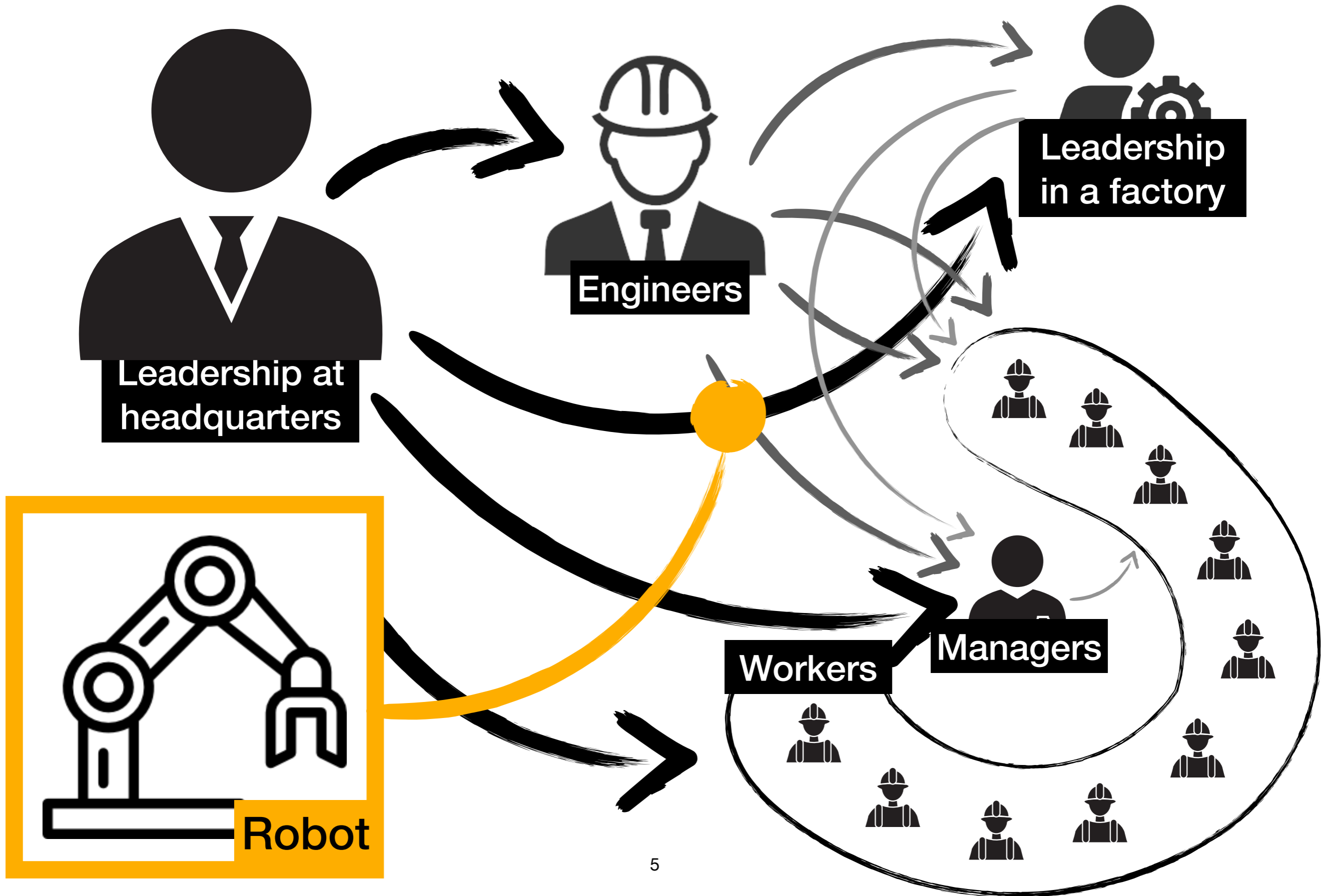
# Power dynamics in Game of Thrones



# Power dynamics in Workplace Automation



# Power dynamics in Workplace Automation



Section 1

# Robots **Challenging Power Dynamics** in HRI Research

Section 2

# Robots and Power Dynamics in **Manufacturing Plants**

Section 1

# Robots **Challenging Power Dynamics** in HRI Research

# Role of 'humans' in HRI research

Type 1: Humans as **generalizable** human (59%)

Type 2: Humans as **Users** in a Context (36%)

Type 3: Humans as **Social Actors** (5%)

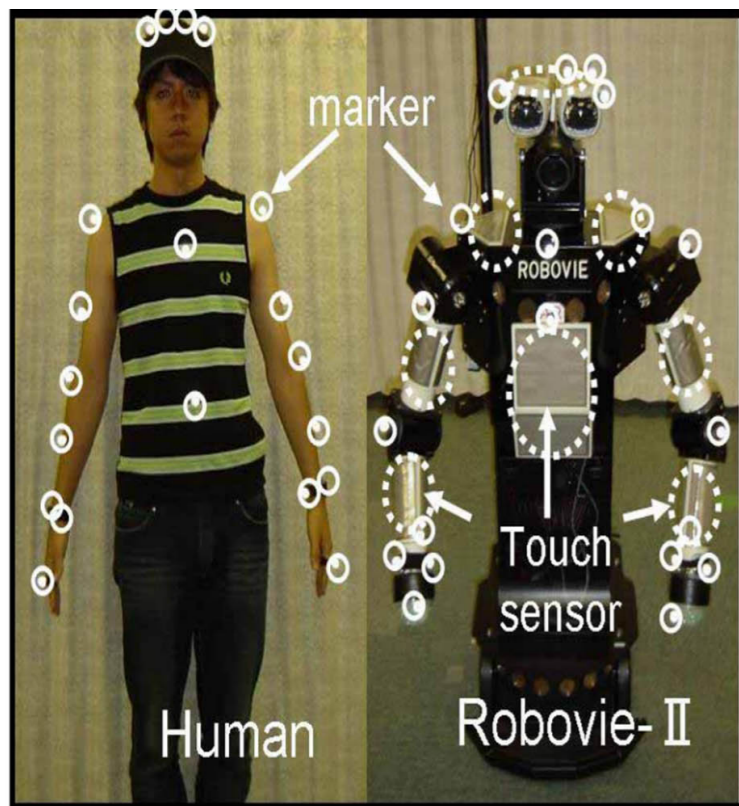


Fig. 2 Human and Robot

Yamaoka et al. (2006)



Figure 1. The INRIA Grenoble Smart Home

Barraquand et al. (2008)

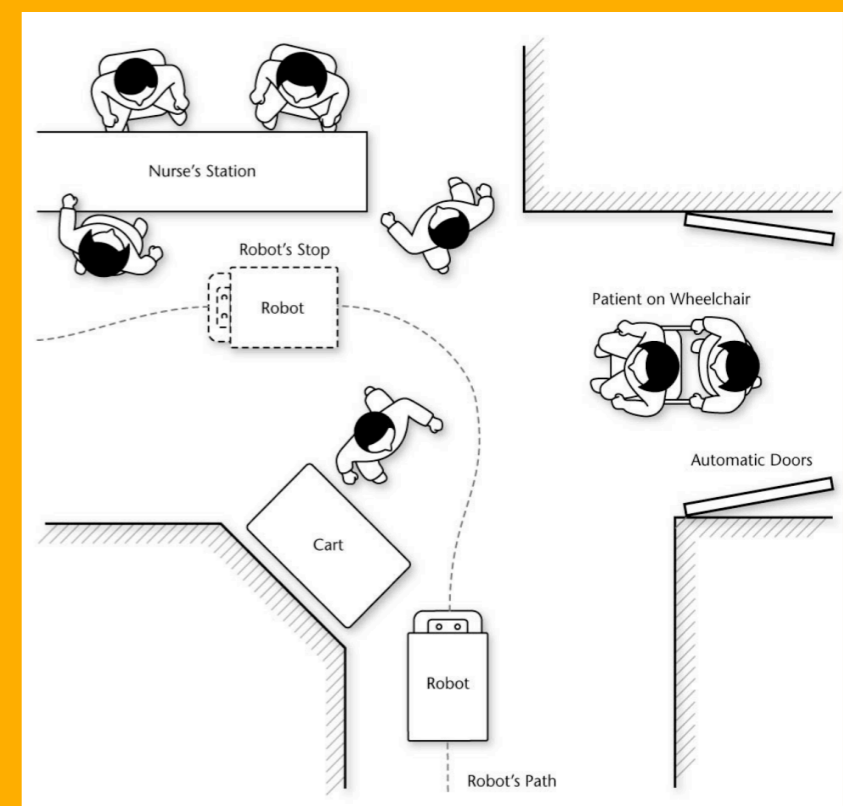


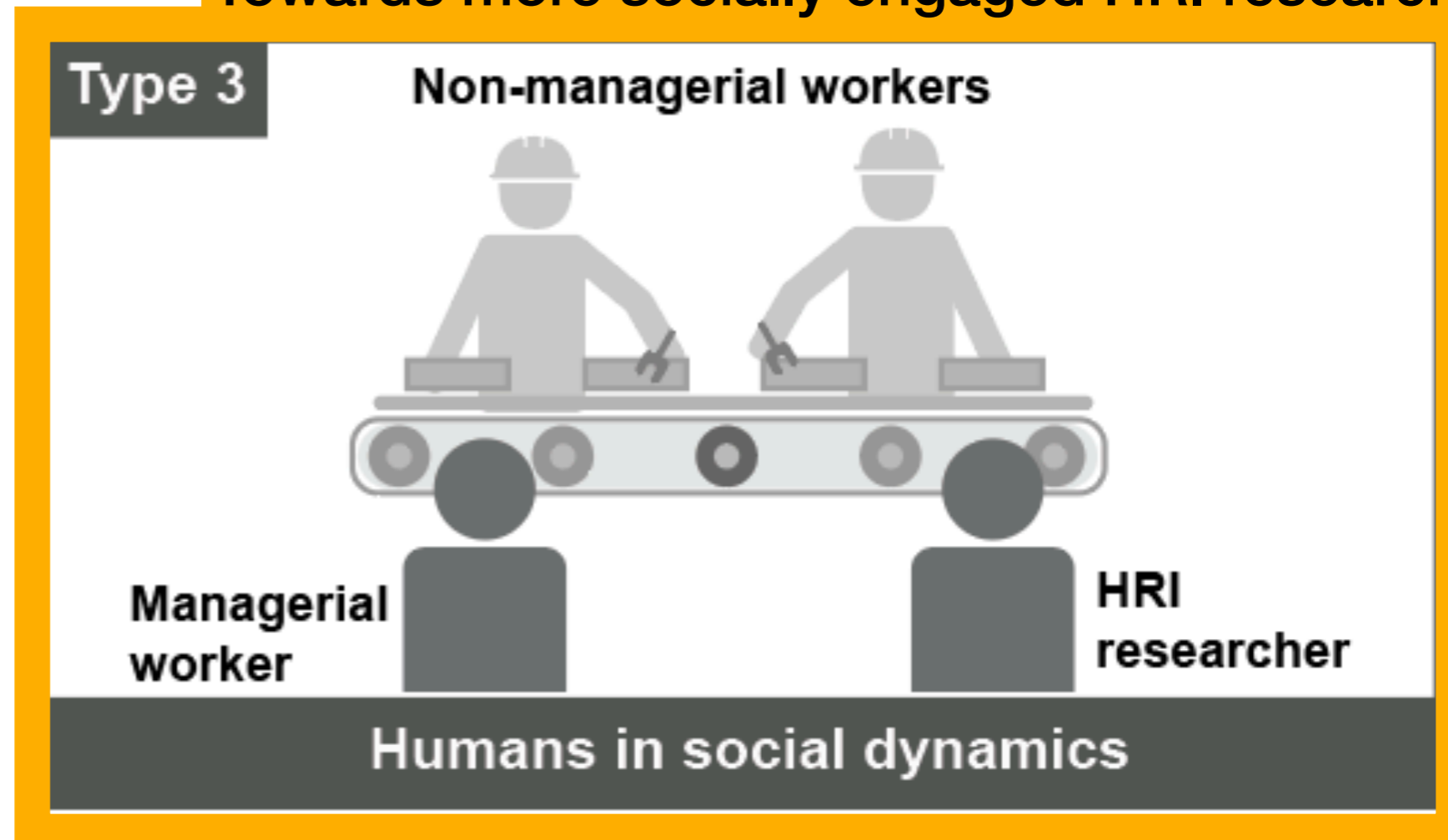
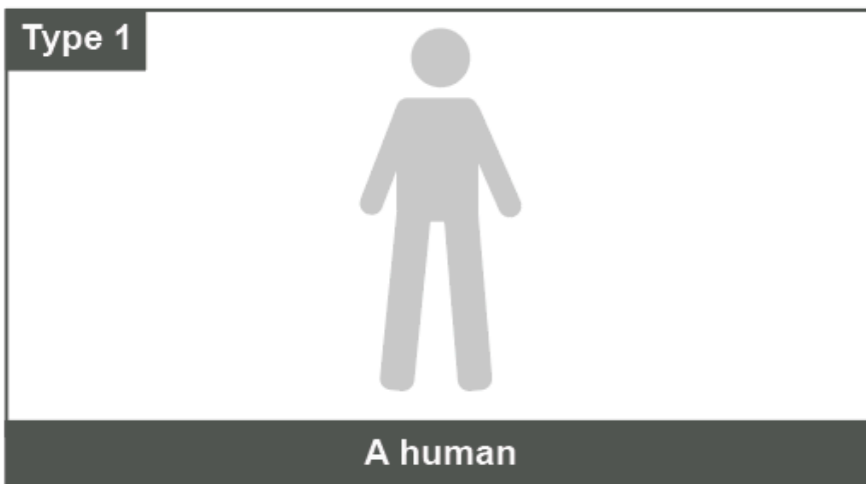
Figure 1. An abstract illustration of the hospital environment as the delivery robot navigates through units.

Mutlu & Forlizzi (2008)



# Opportunity through HRI Research on Power Dynamics

Towards more socially engaged HRI research



Section 2

# Robots and Power Dynamics in a **Manufacturing Plant**

Capitalism



Capitalists

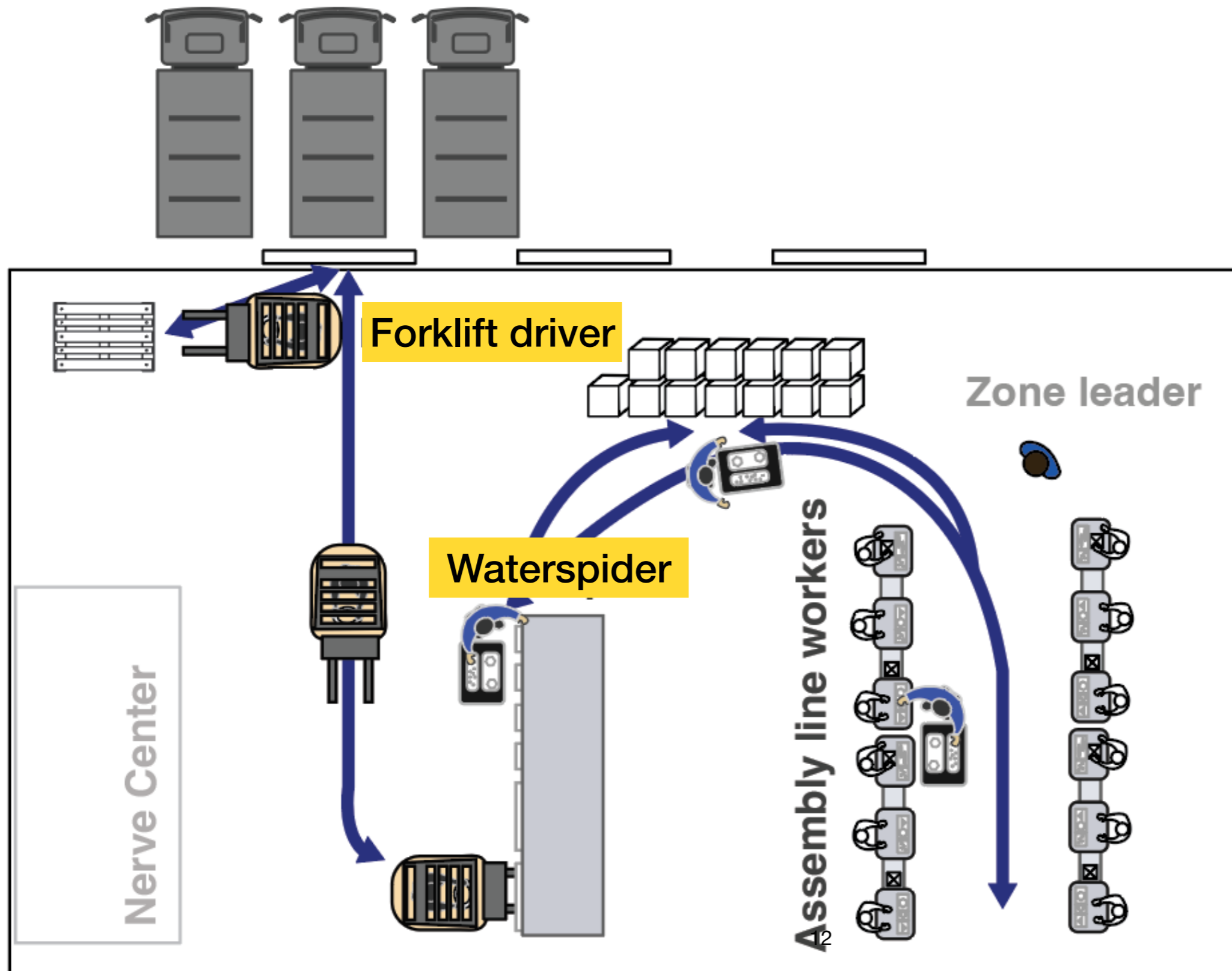
Workers



**"struggles" between capitalists and laborers**  
(Marx, 1867)

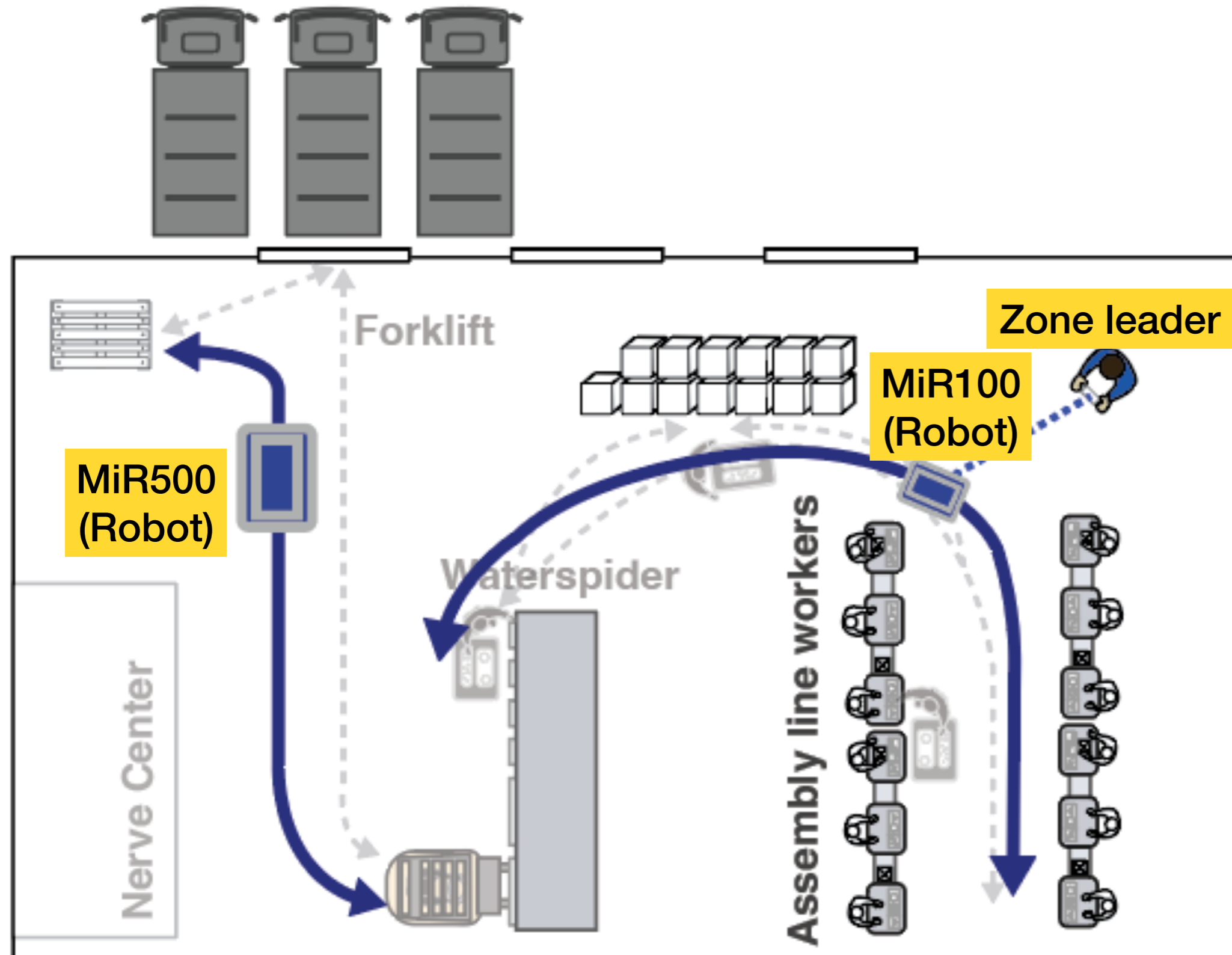
Field site:

# a manufacturing plant in the US



Field site:

# Automating material handling work



Forklift -> MiR500



Waterspider -> MiR100



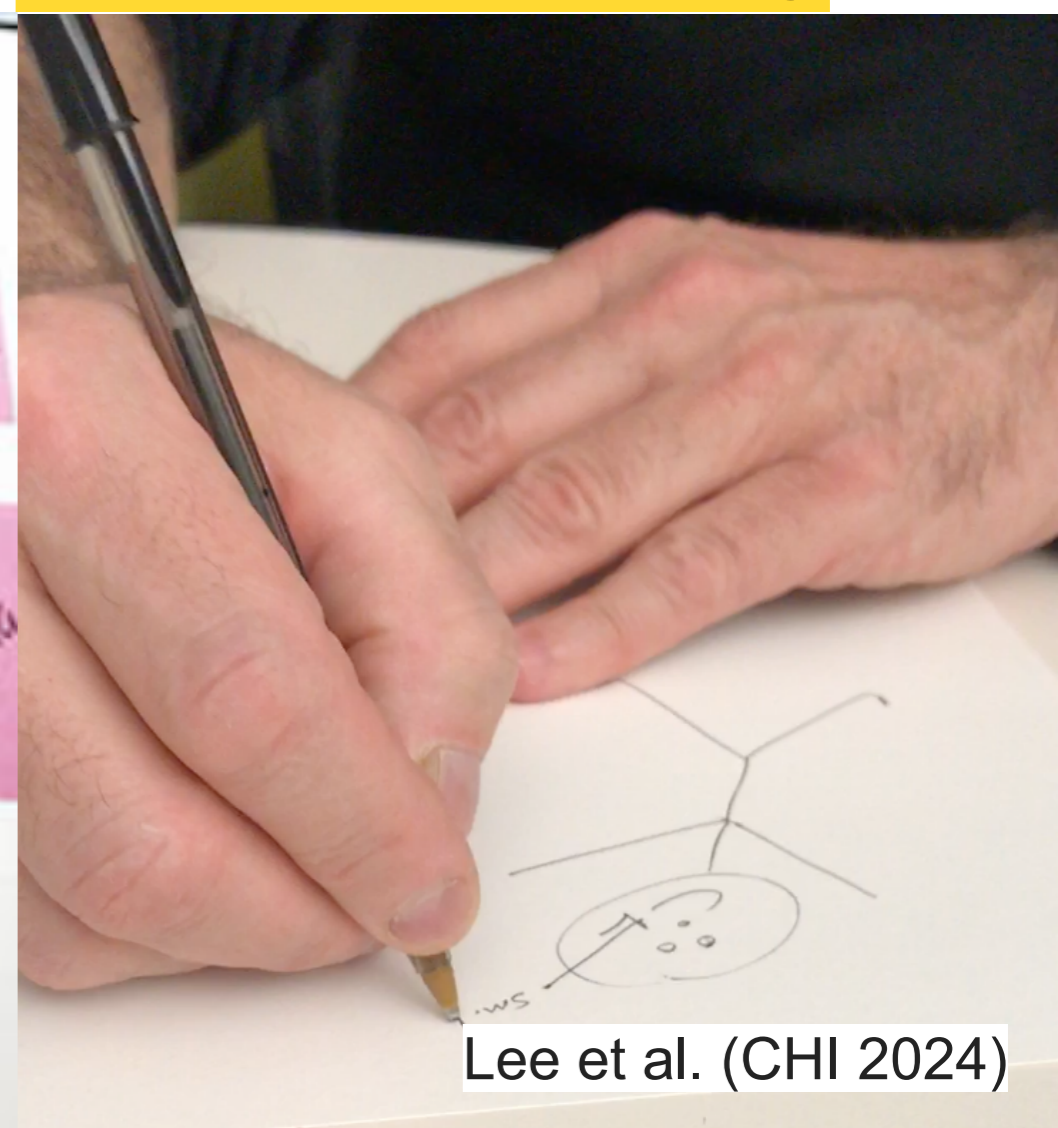
Lee et al. (CHI 2024)

# Positionality

Collaborative map making (Lee et al. 2017)



Ideal robot drawing



# Participants



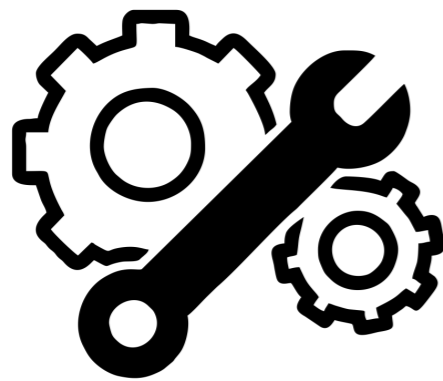
5 Material  
handlers



1 Assembly line  
workers



4 Mid/upper-level  
Managers



1 In-house  
Robotician



1 Sales  
engineer



1 Intern

# Conflicting views on

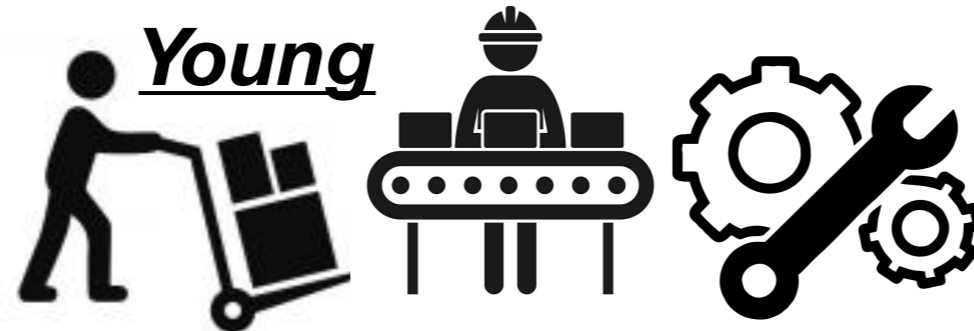
## 1) material handlers

Performs **wasteful actions**



Leadership & sales

Older workers have **narrow knowledge of robots**



Young material handlers,  
assembly line workers & roboticist

**Smart and skilled**

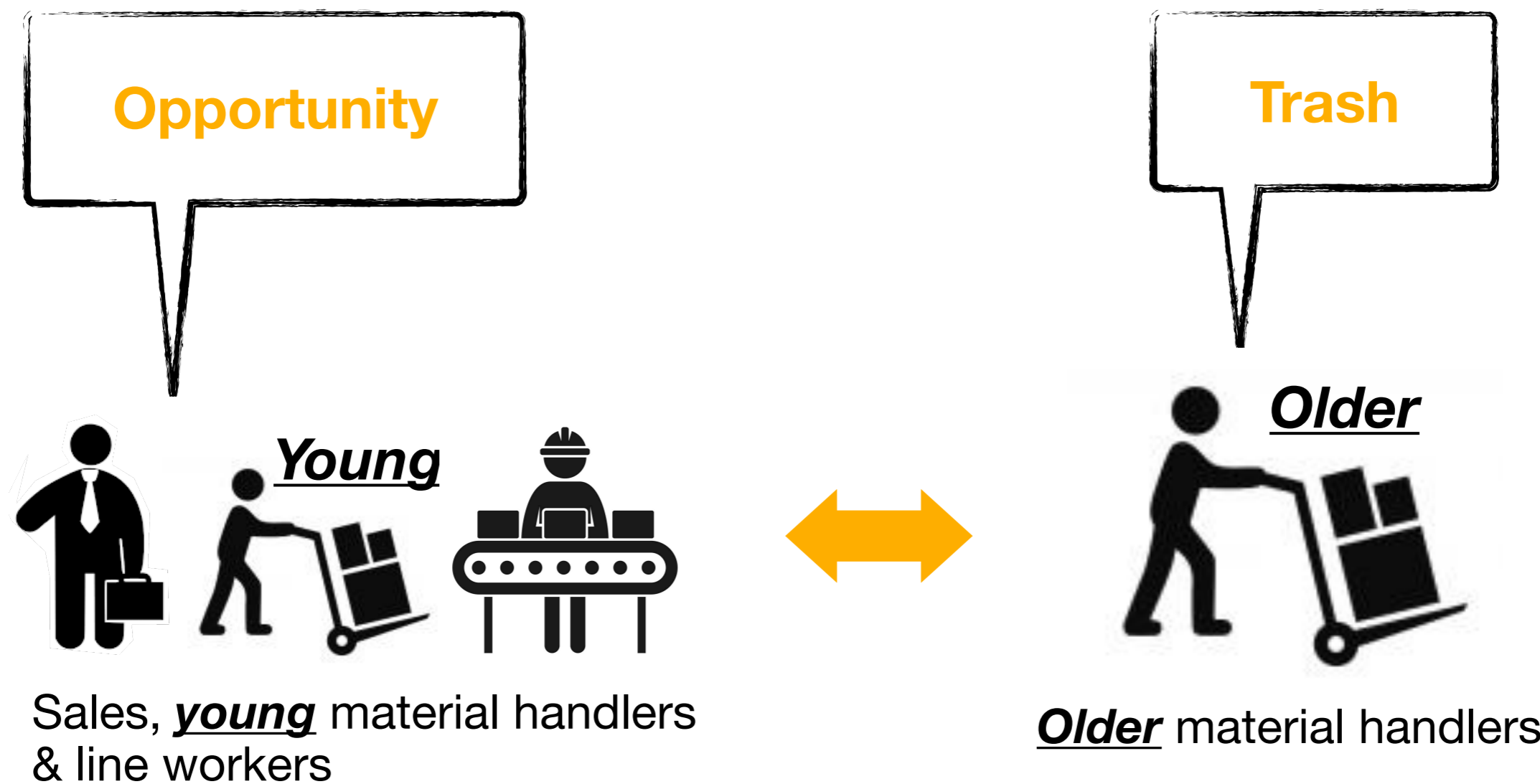


Older material handlers



# Conflicting views on

## 2) the newly adopted robots



# Conflicting views on

## 3) ideal robots

Fully autonomous & quick payback

Strengthening **worker autonomy**, preventing **deskilling**.

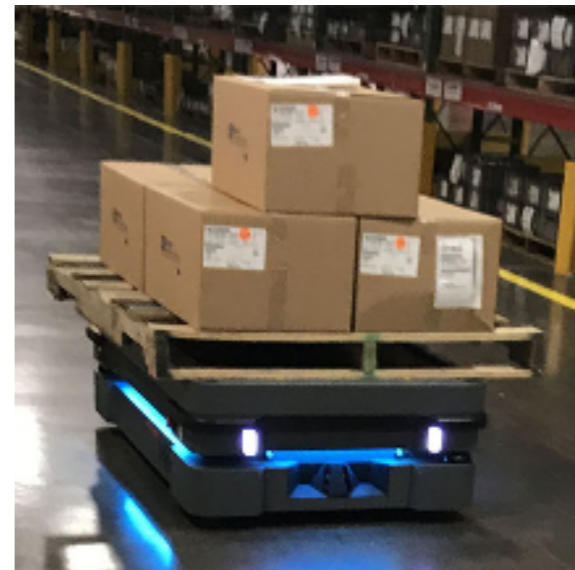


Sales, young material handlers & assembly line workers



Older material handlers

Why does **leadership prefer robots over forklift drivers** who can perform tasks **faster than the robots**?



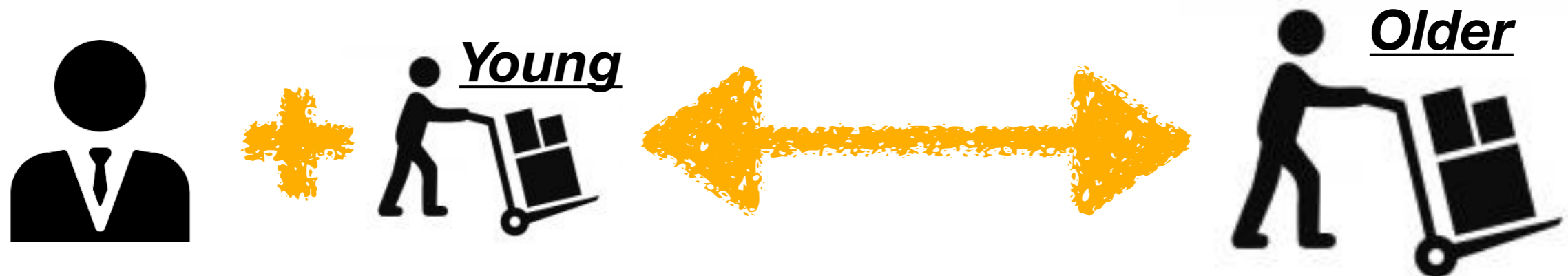
**Robots contribute more to capital accumulation**

**Marx's theory of productive and unproductive labor**

(Marx, 1966; Braverman 1998)

Lee et al. (CHI 2024)

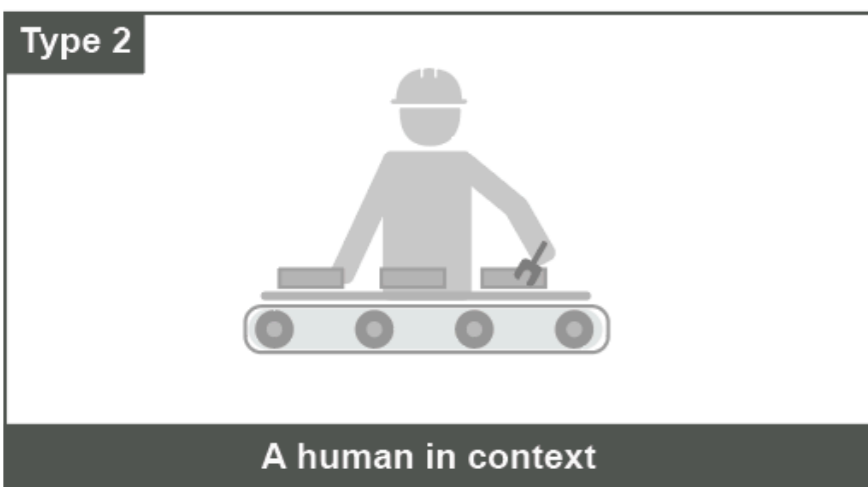
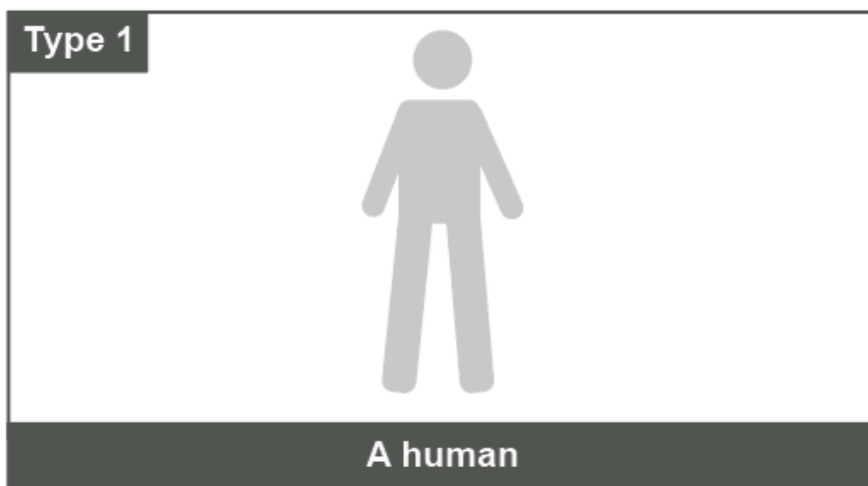
*Why do material handlers **have conflicting views** on their work, the newly adopted robots, and ideal robots?*



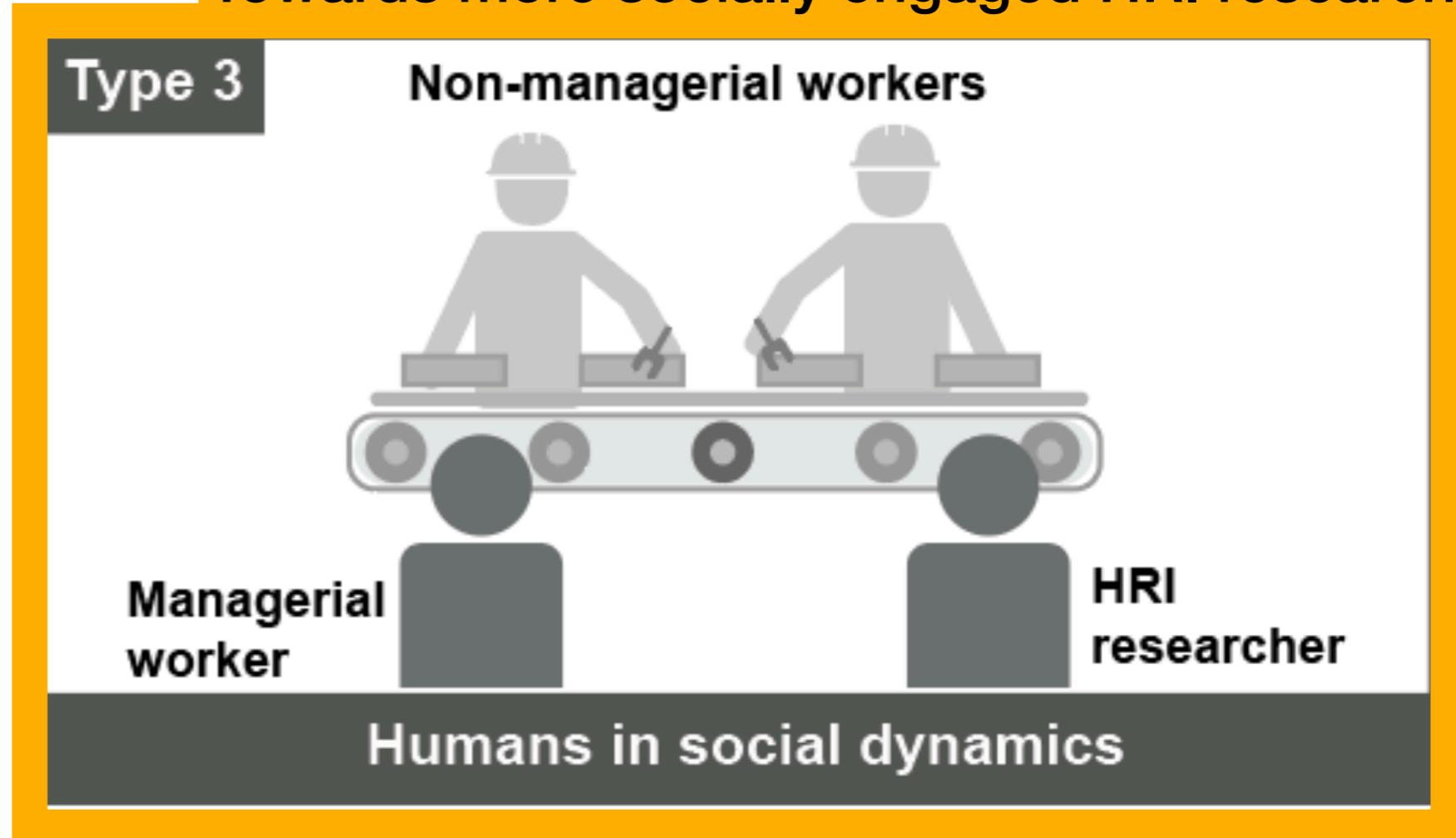
**Worker relations entangled with the restructuring of the economic systems** (Dollales 2023)

Lee et al. (CHI 2024)

# Opportunity through HRI Research on Power Dynamics



Towards more socially engaged HRI research



# Restructuring of economic systems

**Capitalists**

**Collective voices  
of workers**



## Restructuring of economic systems

Capitalists

Collective voices  
of workers



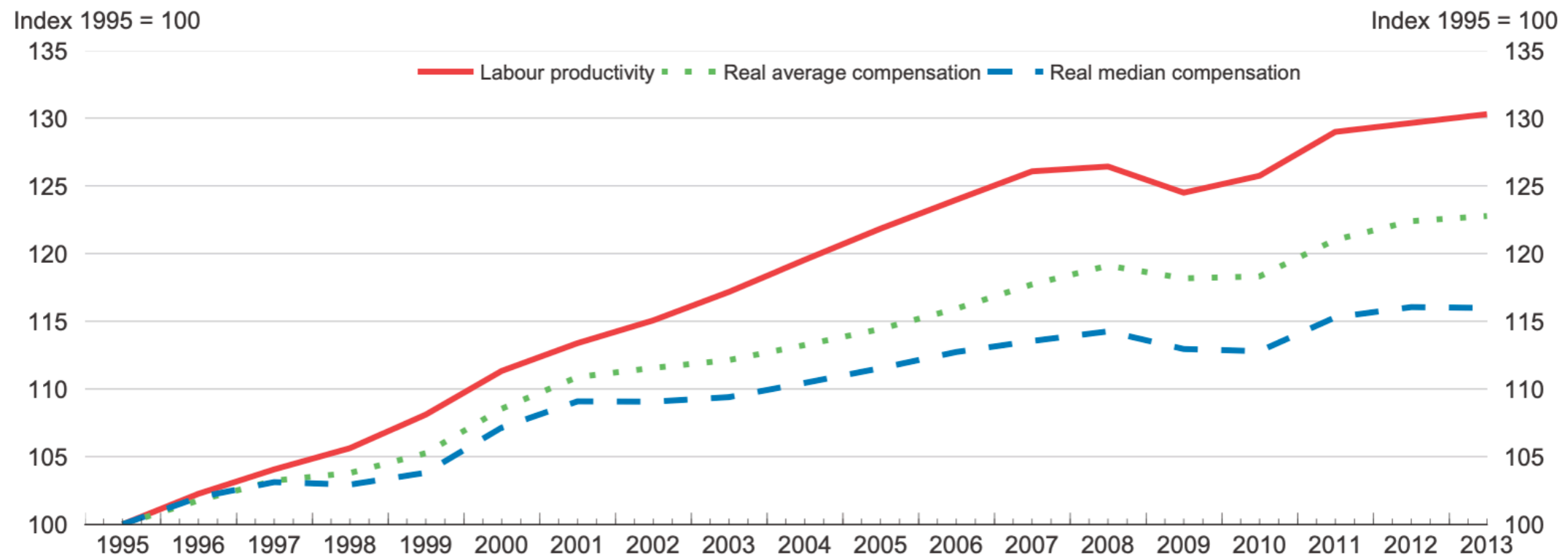
**Inclusive Collective Imaginaries**

(Ehn 1988, Doellgast 2022)

Lee et al. (CHI 2024)

# Decoupling of wages from productivity

Figure 2.2. **Real median wages have decoupled from labour productivity**  
Total economy excluding primary, housing and non-market industries

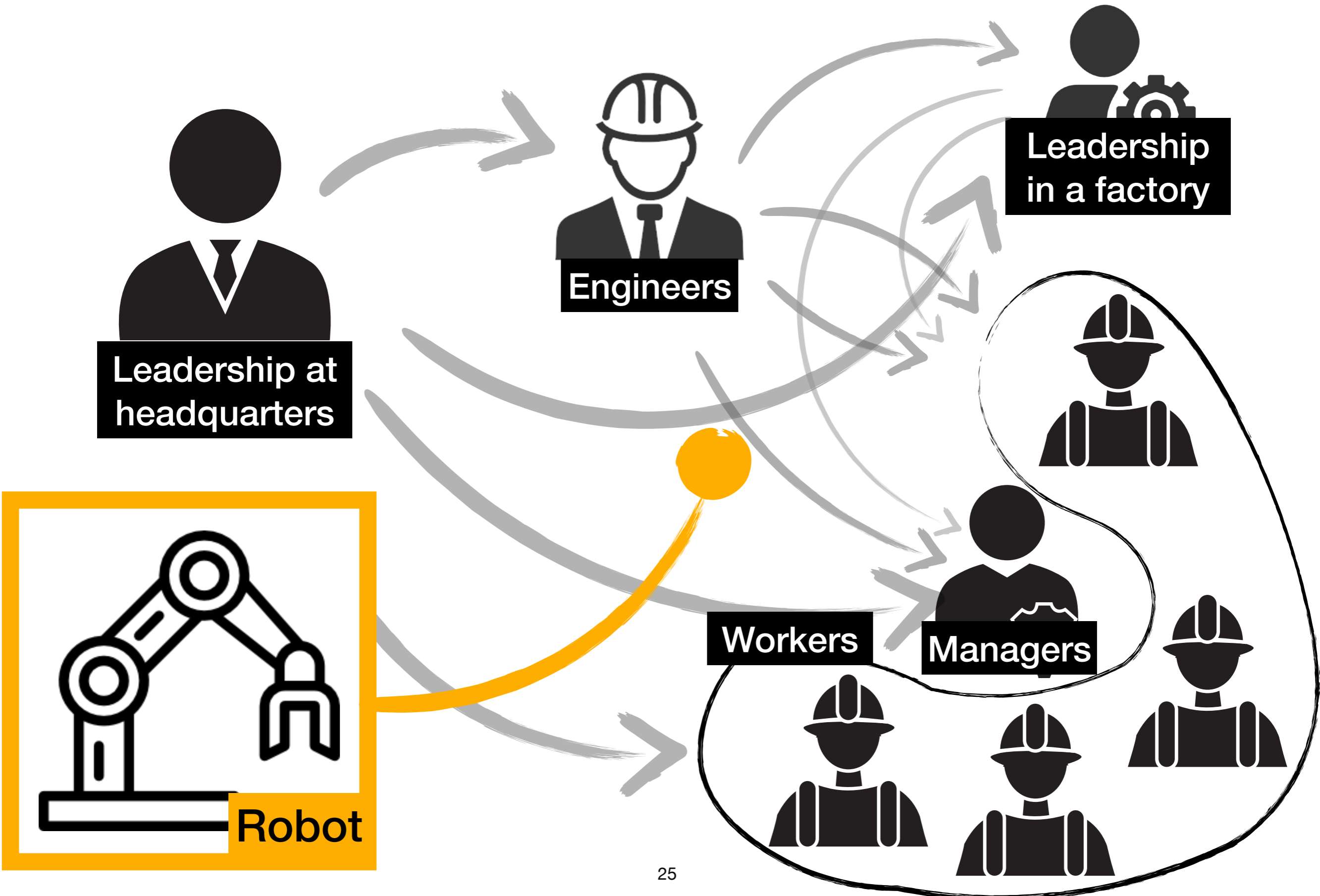


Note: Employment weighted average for Germany, Japan, Korea, the United States, and the United Kingdom; 1996-2012 for Australia, Spain; 1996-2012 for the Netherlands; 1998-2013 for Norway; 1998-2013 for the Slovak Republic. All series are deflated by the Consumer Price Index. Industries excluded are the following: (3) Real estate activities (L), (4) Public administration and social work activities (Q), (7) Activities of households as employers. Source: OECD National Accounts Database.

**Decoupling value of the US (-1.3) >**  
Canada (-0.7), Japan (-0.5), France (0.3),  
and United Kingdom (0.4)



# Power dynamics in Workplace Automation



Thank you!

Q & A

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