Group 7
Service use Robots in Singapore

Theme 2 (2): Relation between applications of robots and their performance

National Junior College

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Robots...

- Are Autonomous
- Have Artificial Intelligence
- Execute Tasks with Precision

スライド 2

1	change imge to flow w sentence Drunken Koala, 2017/11/30
4	are autonomous Wesley Leong, 2017/11/30
3	change has to have Wesley Leong, 2017/11/30
5	executes to execute Wesley Leong, 2017/11/30
1	change to 'execute' Wesley Leong, 2017/12/02
2	change 'executes' to 'execute' Wesley Leong, 2017/12/02

The Service Sector

Assist humans

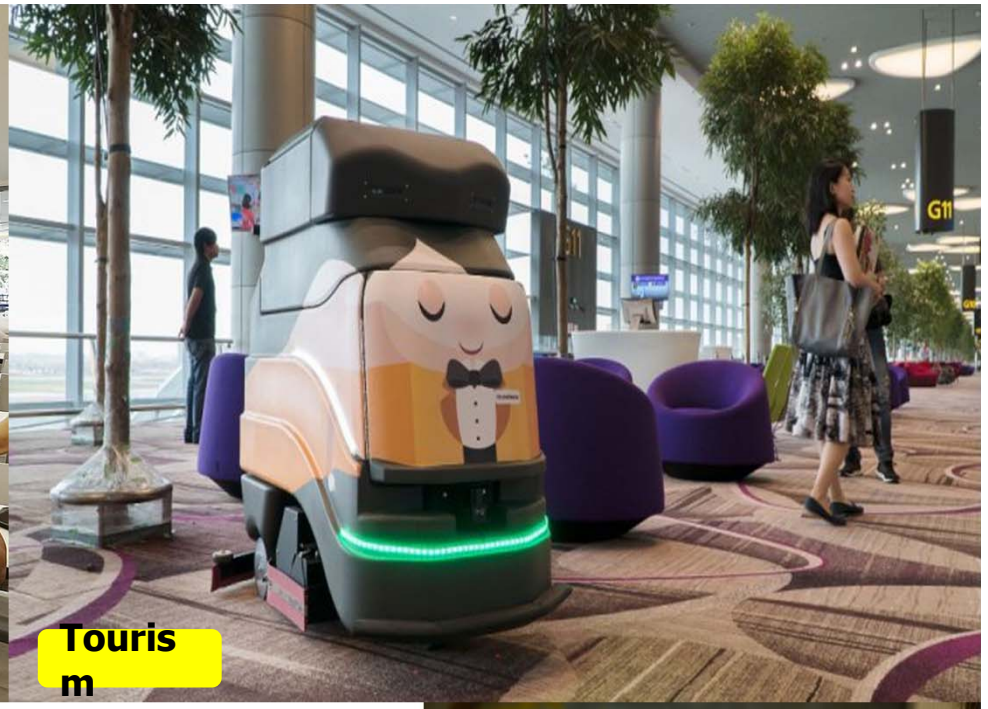
Cater to their needs

6 change to 'assist humans'
Wesley Leong, 2017/11/30

Singapore

A Smart Nation

Food and Beverage



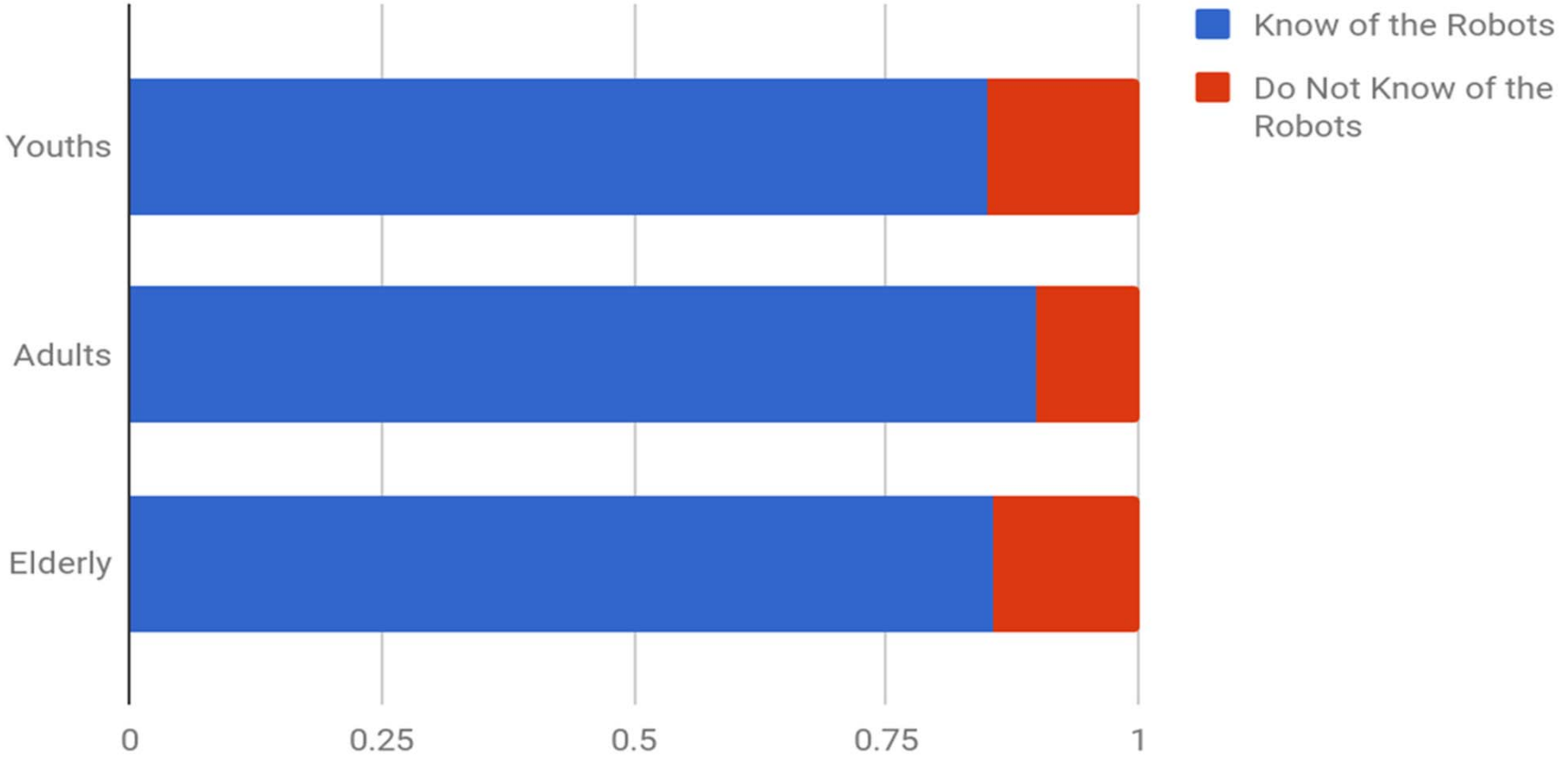
Tourism

Healthcare

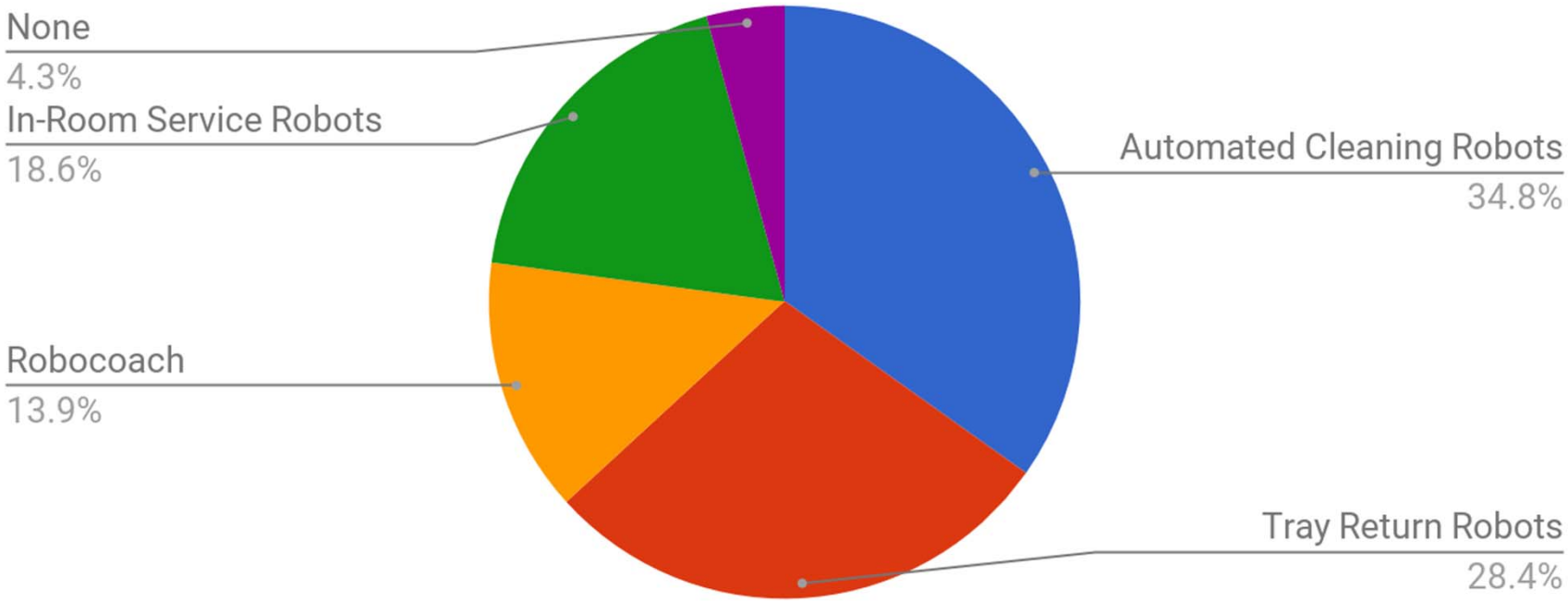
Service Robots in Singapore

Tourism

Do people know about robots?



What do People Want



Sectors

Food and Beverage

Challenge

Solution: *Smart Tray Return Robot*

What does it do?

- Brings the tray return station to customers
- Assists customers and cleaners

Features

Speaks short sentences

Senses its capacity

Detects obstacles to prevent collisions

Impact of use of robots

While...

- Increased convenience for customers to return trays
- It can sense obstacles in close proximity
- Decrease workload of cleaners, allowing them to focus on other cleaning tasks

But...

- Cannot change the customers habit
- It cannot reroute
- Limited capacity

Insights from IREX

What?
TeraRanger

What does it do?

- Sense obstacles as far as 60m away
- Plan the most ideal path to avoid obstacles.

Insights from IREX

What?
Amy

What does it do?
- Assists customers and waiters

- Allows customers to order food

- Delivers food

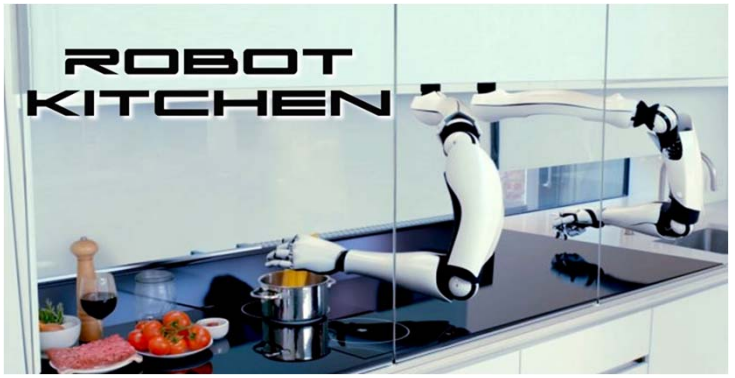
Insights from IREX

What?
Dishwasher robot
(Ritsumeikan University)

What does it do?
- Uses camera sensor to detect thickness and position of dishware
- Tips of grasping mechanism can pick up utensils.

State of the Art

What?
Robotic Kitchen
(Moley's Kitchen)

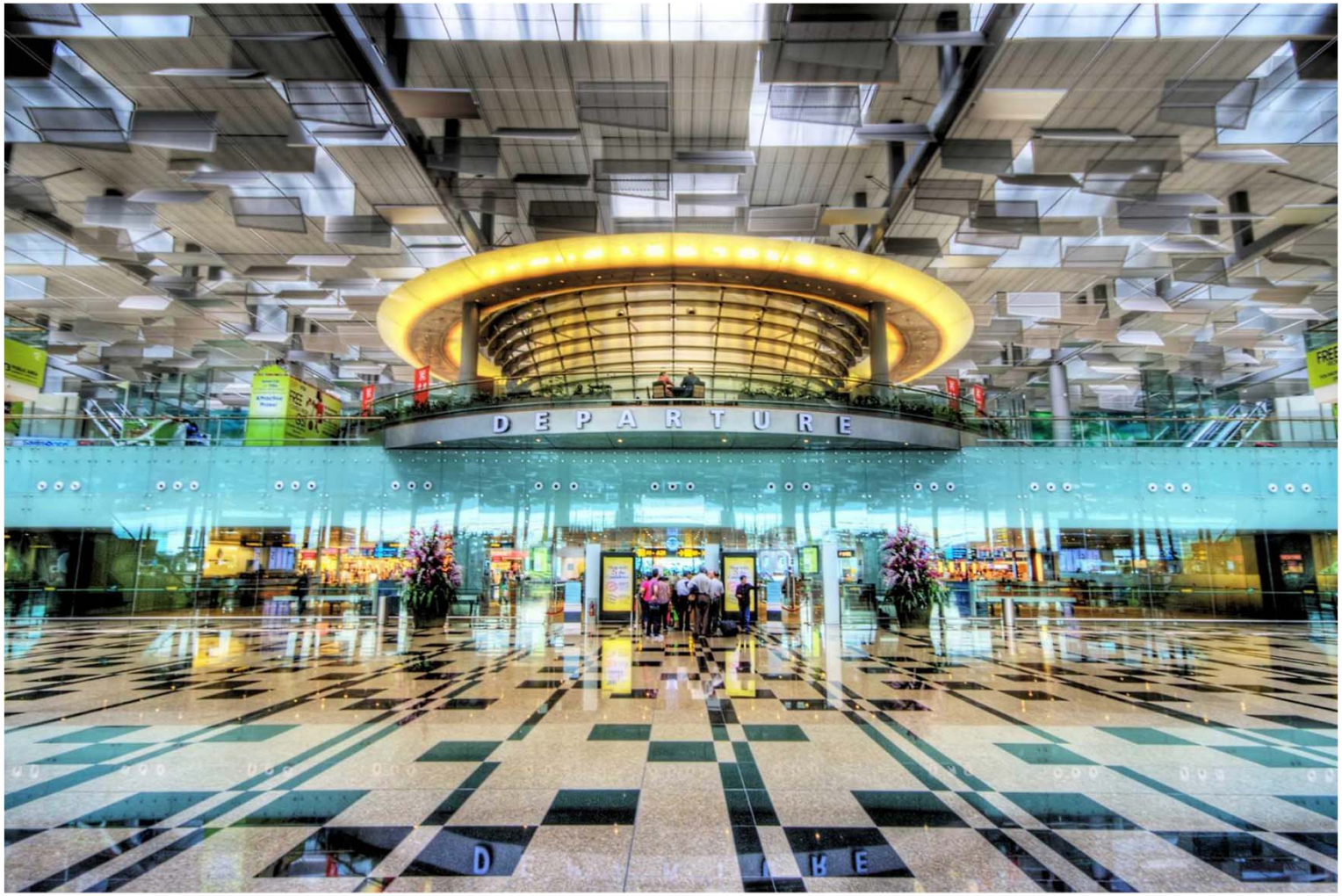


What does it do?

- Records human actions in 3D; replicates the movements to prepare meals.
- Cleans the kitchen after cooking.

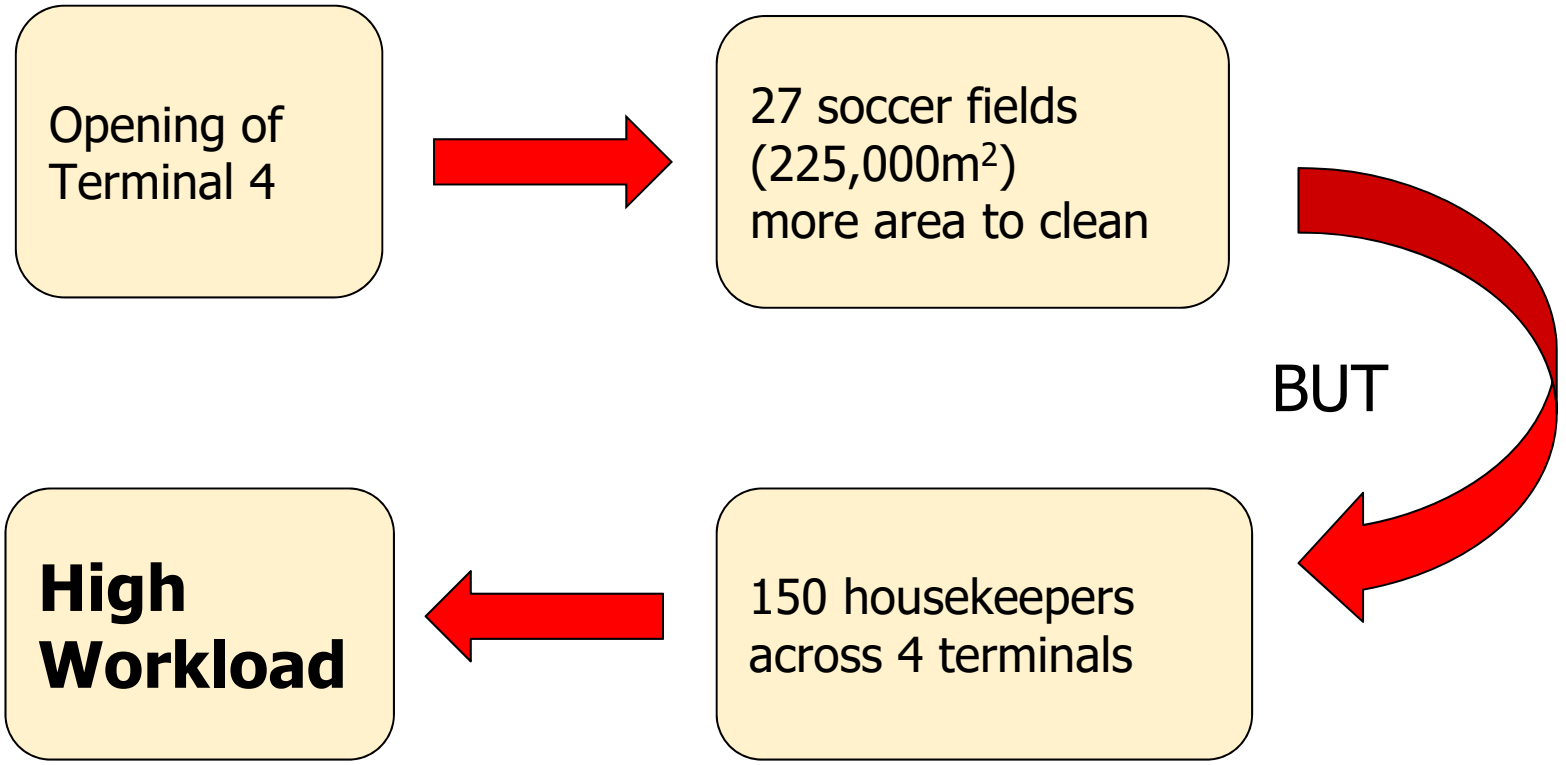
In the near future..

Hawker Food



"Best Airport in The World"

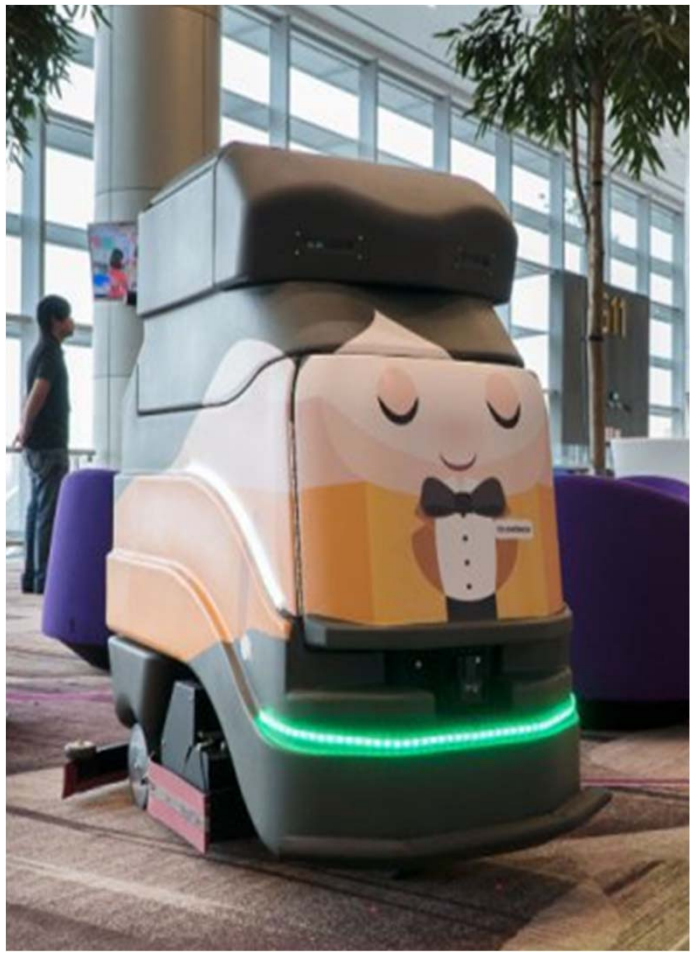
Context


Opening of Terminal 4
27 soccer fields (225,000m²) more area to clean
BUT
150 housekeepers across 4 terminals
High Workload

Solution: *Automated Cleaning Robot (Neo)*

What does it do?

- Sweeps, vacuums and mops the floor
- Assists human housekeepers in keeping the airport clean.



Features

Integrated collision avoidance technology, 3-D cameras, lasers

3-in-1 : sweep, vacuum, mop

Real time connection

5 hours continuous run time

Advantages of robots compared to human housekeepers

Robot Housekeepers	Human Housekeepers
Can be programmed to clean all areas	May miss out certain spots while cleaning
Works faster	Works slower
More working hours	Less working hours

Impact of use of robots

While...

- Long-term savings due to decrease in demand for housekeepers
- Increase in job opportunities for older workforce

But...

- High initial cost of implementation (~USD 60, 000)
- Loss of housekeeping jobs for the younger workforce

State of the Art

What?
Knightscope (K1, K3, K5, K7)

What does it do?

- Patrols and guards designated areas autonomously
- Scans car license plates and recognise faces.

Insights from IREX

What?
Sanbot Elf

What does it do?

- Patrols and guards designated areas autonomously
- Has facial recognition and voice localization to detect suspicious people

In the Near Future...

Thank You!

ご清聴ありがとうございました。