Robots escaping from Factories to the Real World!

Industrial robots in a factory

Waste collection robot in a shopping mall
Robots found around Singapore Today

Senserbot Shelf-Reading Robot at Tampines Regional Library

Techmetics Robotics A.H.B.O.I at Payar Lebar Quarter

Wizz Mobility FoodBots at National Technological University

Source: https://govinsider.asia/
Source: https://grab.com/sg
Source: https://foodpanda.com
Robots at Changi Airport

Robots helping with cleaning, providing refreshments, and traffic enforcement

Source: https://changiairport.com
Are robots always the solution?

Viable Business Model

• Comparing **Humans vs Robots** in terms of
  • Cost
  • Efficiency

Operational Constraints

• When **human intervention** is required to assist robots to perform their work
  • Navigating between floors
  • Charging
Challenges to successful adoption of robots

- How will my robots integrate with my buildings and my current workforce?

- Ultimately a question of cost and efficiency
Robotics Middleware Framework

RMF Core is the brain of RMF

A collection of libraries and utilities for assisting vendors to integrate with the RMF

- Pure C++ libraries for:
  - *Path Planning, Conflict detection & resolution*
- ROS2 wrappers of C++ libraries
- Templates and examples of applications
  - *Lift / Door adaptors, Smart Fleet Adaptors*

Source: Open Robotics
Benefits of having a successful RMF

Crowd Sourcing Solutions

- How do we get the best ideas to the table?

Greater adoption across fleets

- How do we ensure as many partners are onboarded for this journey?
Benefits of having a successful RMF

The rest of us