



# MODULE 7: DEVELOPING AN MVP FOR YOUR ORGANIZATION

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- Future of Autonomous Robots and Vehicles in Industry Transformation
- Design Considerations
- Development Process for Autonomous Robots and Vehicles



# Introduction



- This module is to train and teach participants to design and implement an autonomous robot MVP for real world applications
- Robotic professionals need to identify proper pain points and design considerations in order to tackle to ensure success



# Future of Autonomous Robots and Vehicles in Industry Transformation



## Self-chauffeured cars

- Drop-off, self-park, pick-up on demand
- Valet mode

## Driver assist/semi-autonomous

- Lane deviation prevention
- Collision prevention
- Localized path planning in heavy traffic



<https://www.alphr.com/cars/1001329/driverless-cars-of-the-future-how-far-away-are-we-from-autonomous-cars>



# Future of Autonomous Robots and Vehicles in Industry Transformation



## Inspection and repair drones

- Pipes, buildings, ships, towers



# Some Design Considerations



- 1. Sensors: Design and reliable operation**
- 2. Sensor fusion**
3. Electrical architecture
- 4. Path planning and Decision Making**
5. UI Design, Monitoring and Function
- 6. Safety**



# Development Process for Autonomous Robots and Vehicles

## Look for:

- Daily pain issues ( no pain, no interest)
- Revenue generating or manpower/cost saving opportunities

## After identifying, ask yourself these questions:

- Can the problem be solved with other cheaper alternatives than using robots?
- Will robotics result in cost or manpower savings in the long run?
- Will it infringe any company IT policy or ethical policies?
- Will it cause inconvenience in any way?
- Is it cheap to try out?



# Development Process for Autonomous Robots and Vehicles

## Design

- What is its purpose?  
And design/constraint factors to consider?
- What is the technical requirement?
- Info about required hardware and software components?
- Components integration plan and tools?
- Robotic flow process (see next slide)

## Production

- Assembly requirement and process?
- Diagnosing of issues during prototyping or production

## Service

- Maintenance requirement and monitoring?
- Reliability issues and Mitigation Plan?
- Safety and Security Risk and Mitigation Plan?

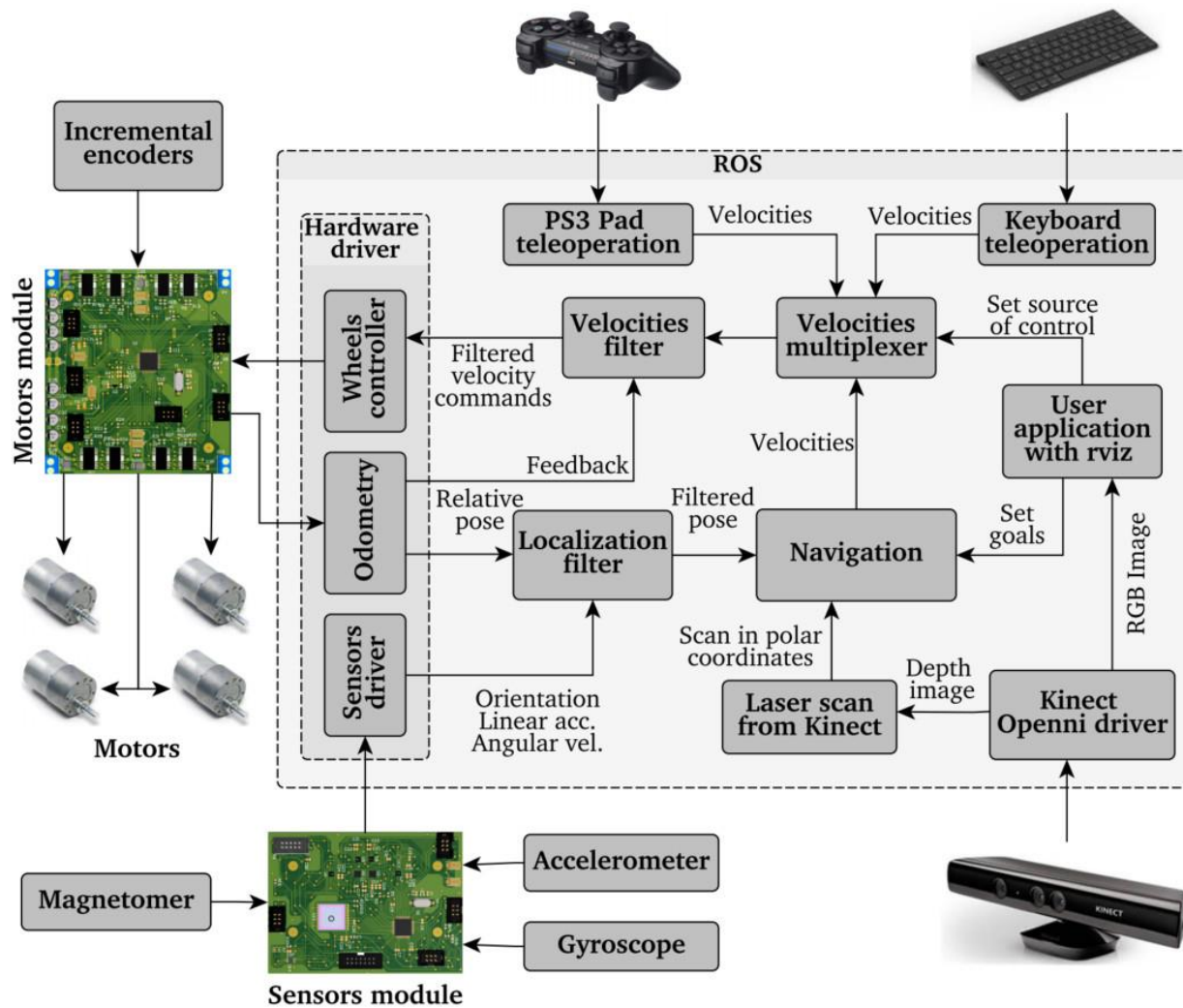
## Focus

**\*\* Use the pointers as a guide only.  
Need not follow everything.**





# Example of Robotic flow process (RECAP)

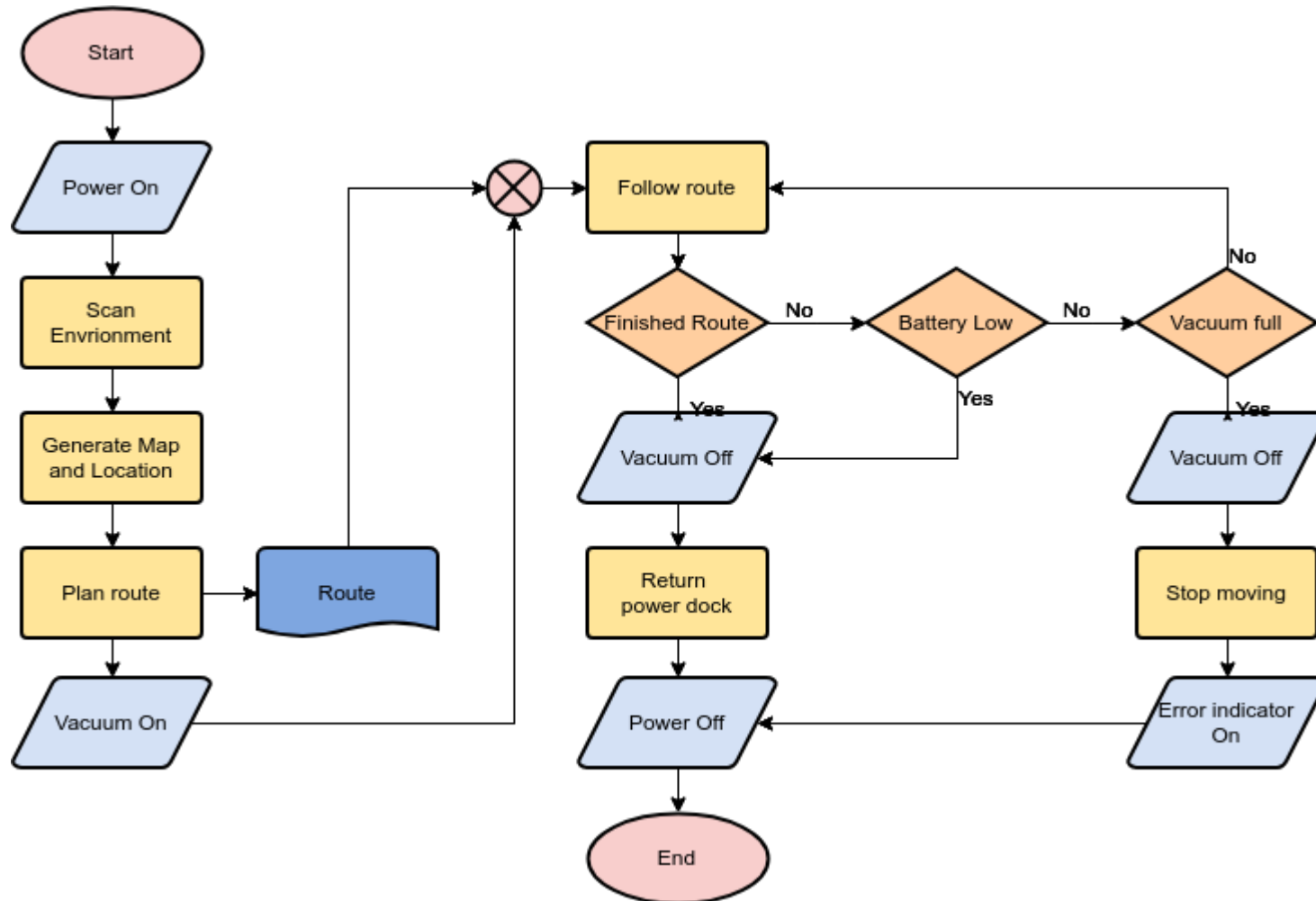


## Various critical components:

1. Sensors
2. Variable derived
3. Processing
4. Sub-Components
5. Decisions
6. Actuation/Action



# Autonomous System Flow Process Example (RECAP)





# Homework



- **Prepare a real autonomous robotics implementation plan** specific to your work place or identified use-case
- Include all the points discussed in the previous few slides
- **To be presented and submitted on the 5<sup>th</sup> day**
- **10 minutes presentation** (around 10 slides) and 5 minutes Q&A per person
- Have more graphics/charts/figures than wordy
- PowerPoint-based
  - Use template provided



# End of Module 7