



Project Structure

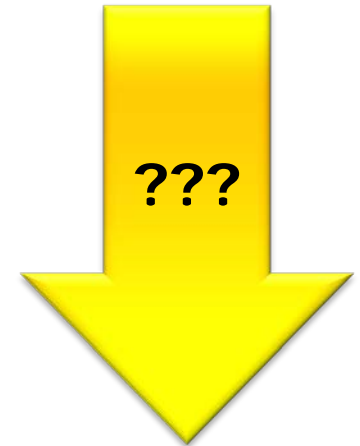
"Structure is everything"

Prof. Erich Styger
erich.styger@hslu.ch
+41 41 349 33 01

**Scriptum:
Project Structure**

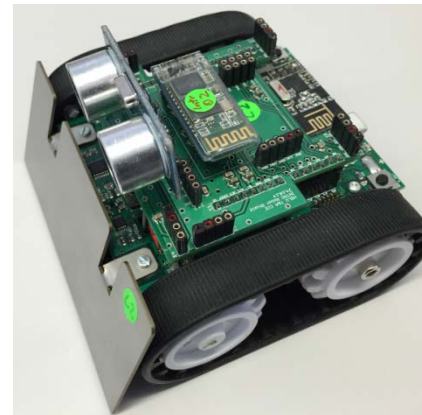
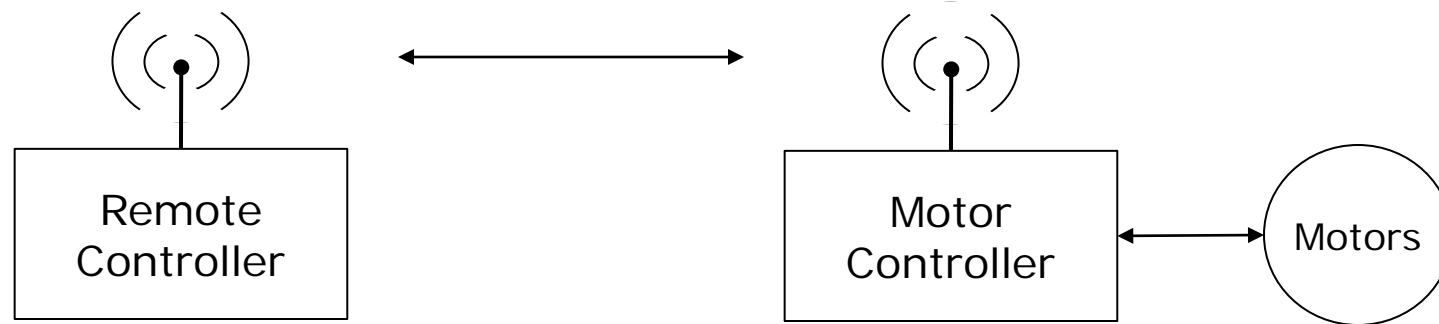
Learning Goals

- Problem: Requirements and Project Organization
- Requirements decomposition
- Top-Down approach
- Hardware blocks
- Project/Directory Structure



High Level Requirement: Single Use

- Using FRDM-KL25Z as accelerometer remote controller



Remote Controller

- Essential

- Transceiver on both sides
 - Communication Protocol
- Joystick
 - Calibration
- Remote DC Motor/H-Bridge
 - left, right, speed, forward, backward
- Realtime

- Supportive/non-essential

- Sniffer, Shell, Configuration Management
- LED, Buzzer, Button

- Limitations

- FRDM Board powered with USB
- (or use USB 5V Battery)



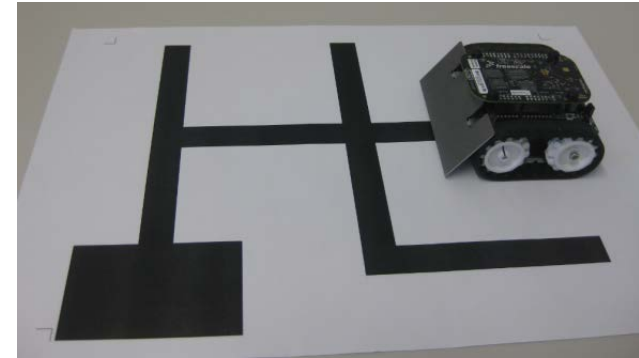
High Level Requirement

- Essential

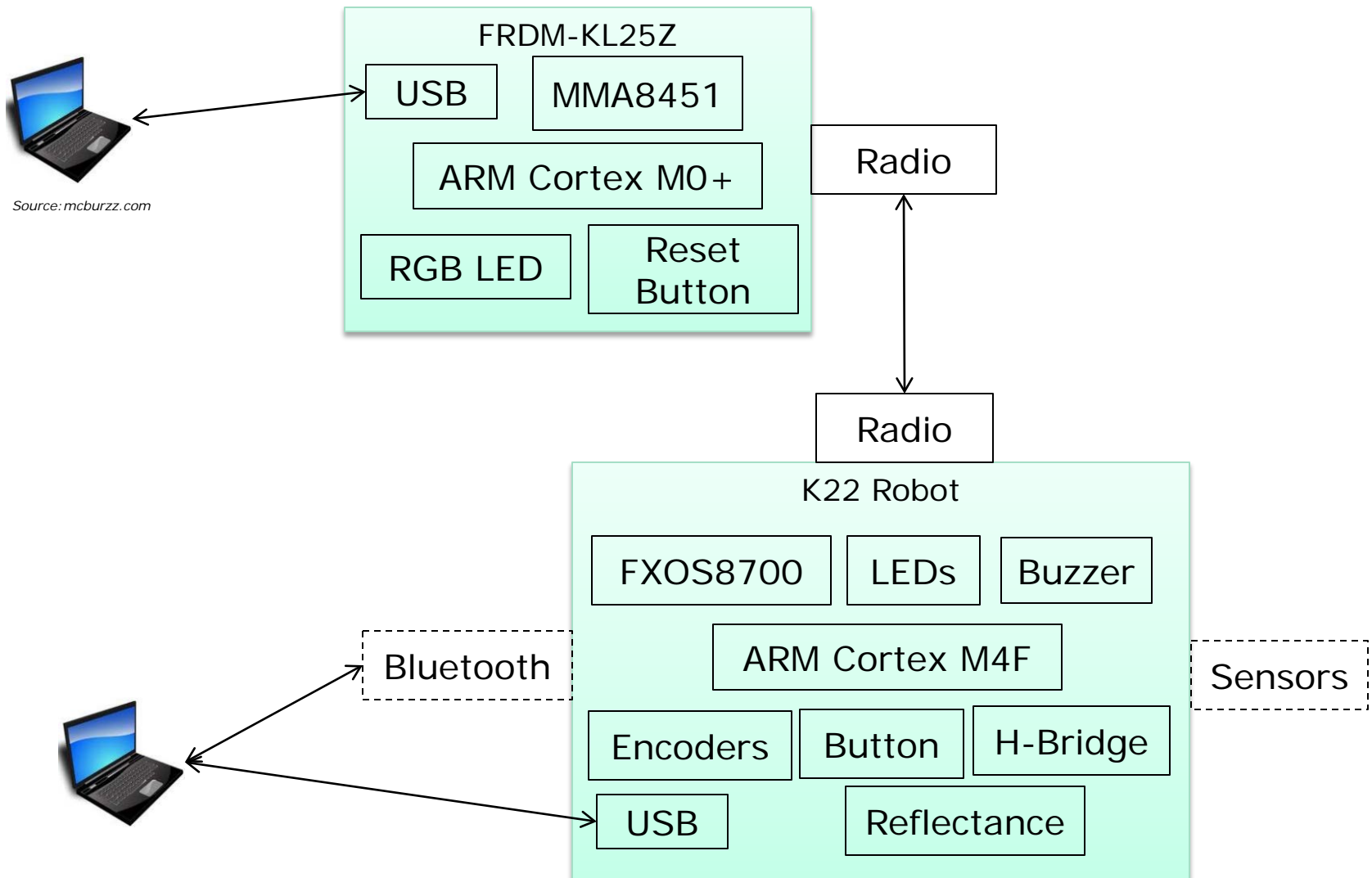
- Black Line/Block Detection
 - IR Reflectance sensor
 - Accurate turning, quadrature encoder, PID
- Obstacle Detection
 - Ultrasonic and/or IR sensor

- Supportive/non-essential

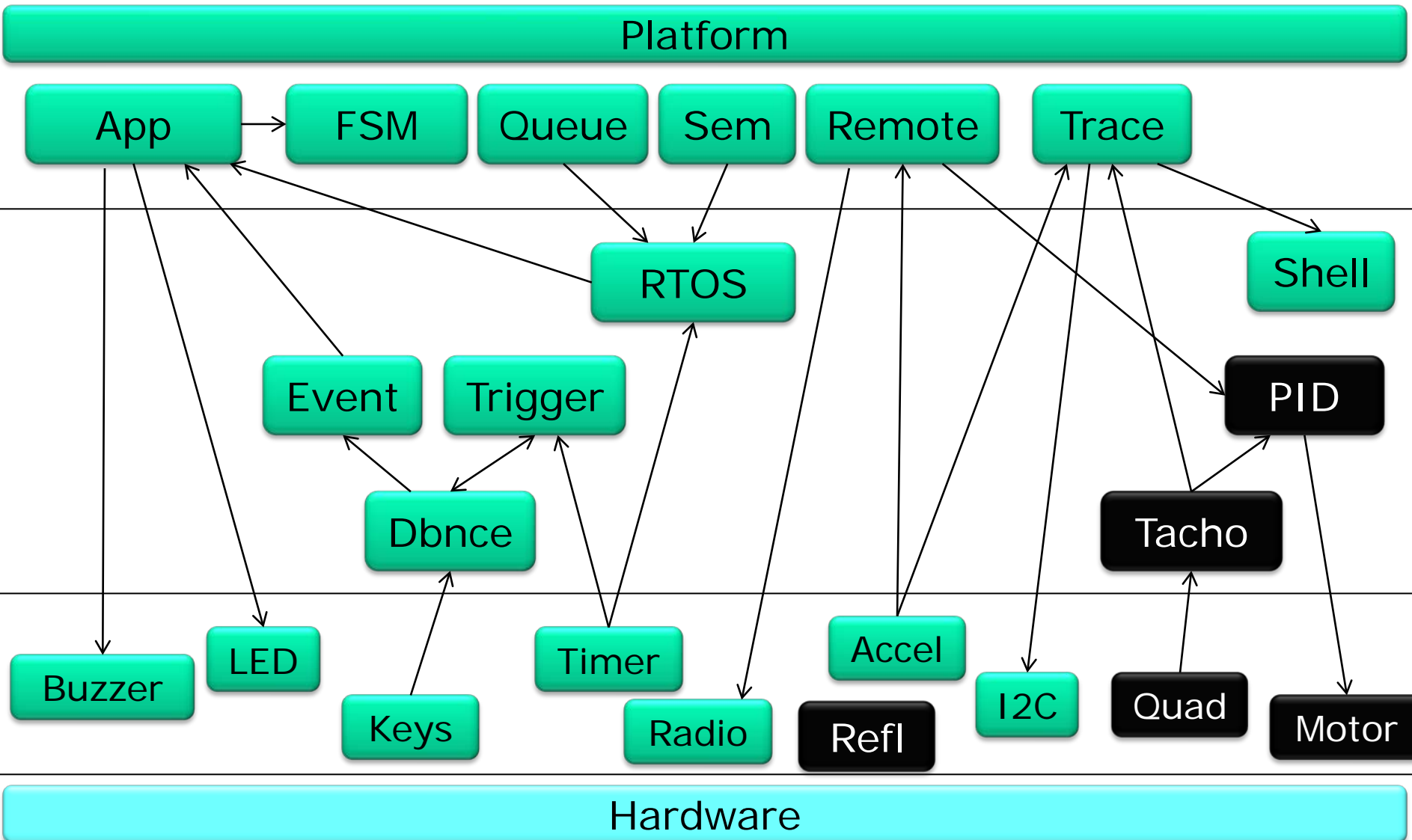
- Accelerometer/Magnetometer
- Remote configuration/control
- Shell, Bootloader
- LED, Buzzer
- Deadlock detection, Watchdog



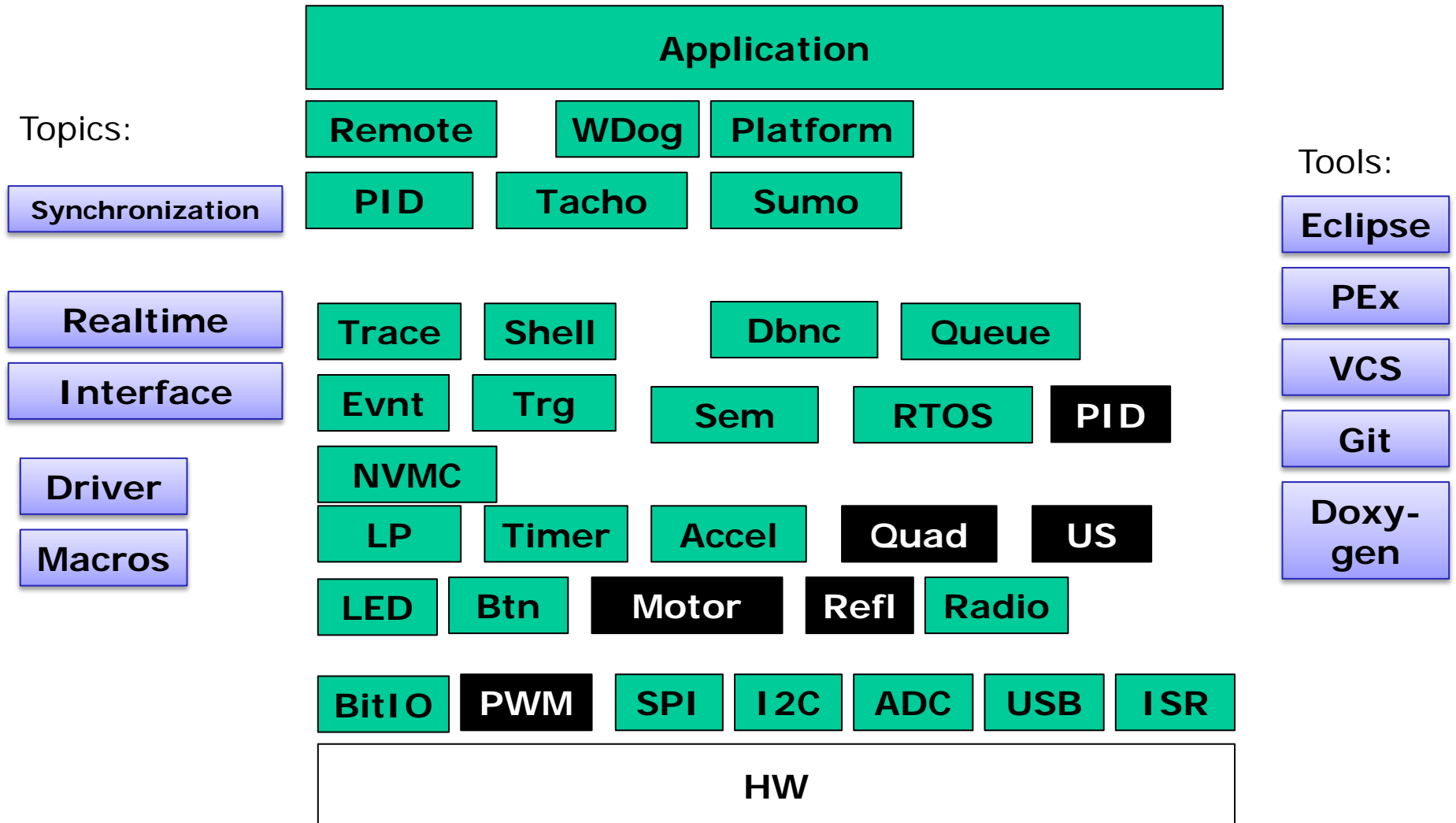
System Blocks



System Architecture

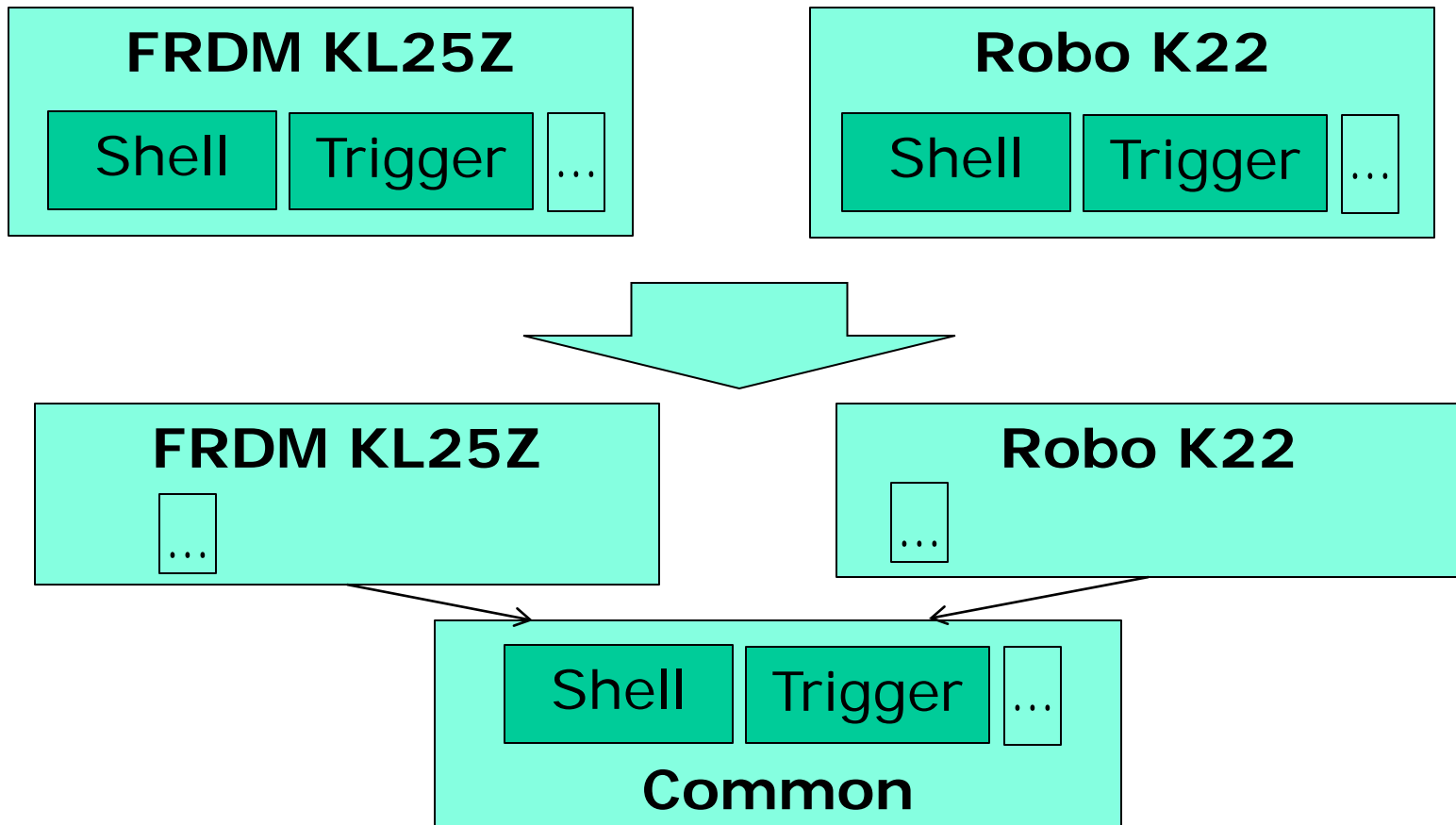


Modularization



Sharing Common Files

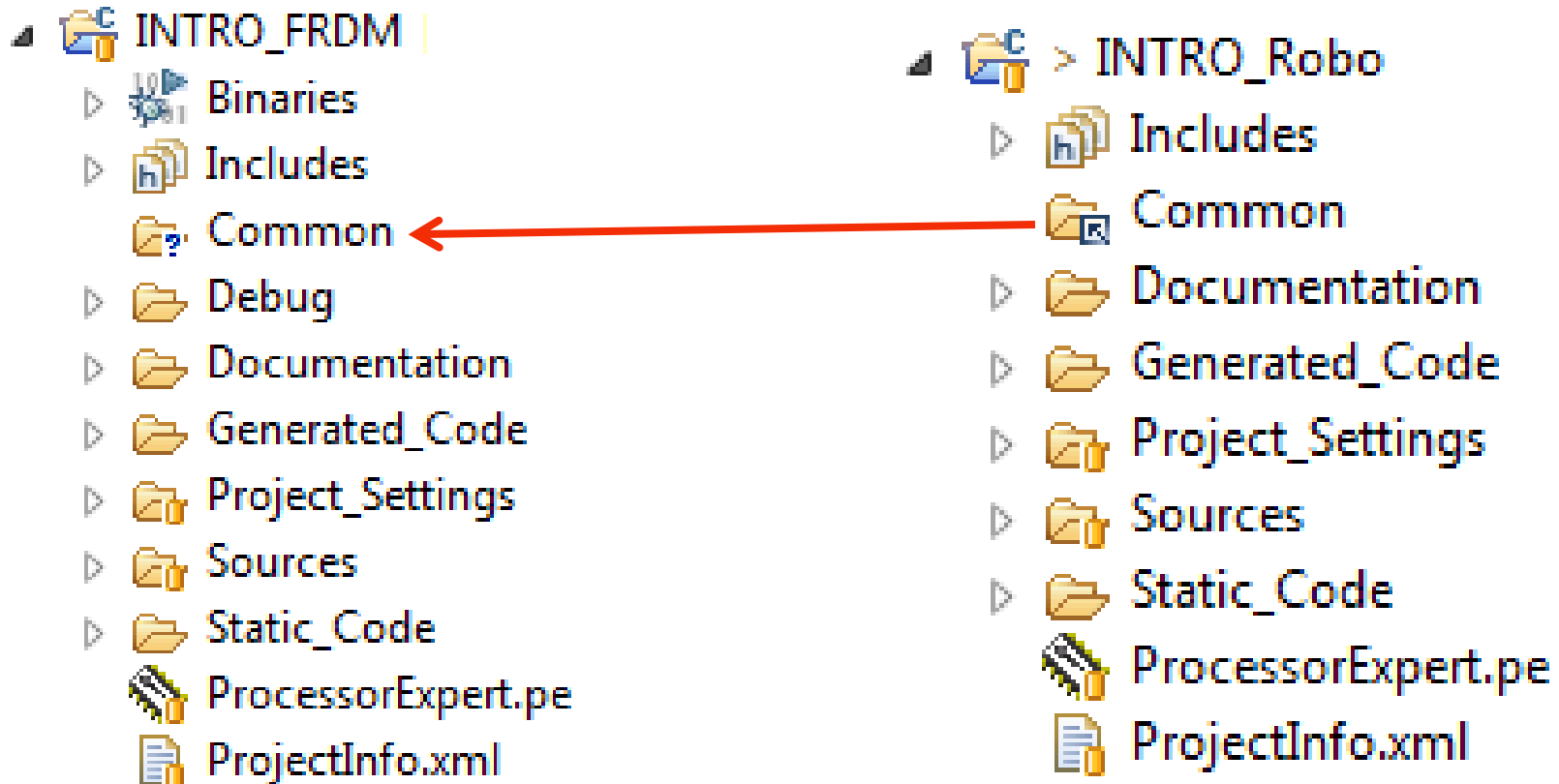
- 'Library' of common files
- Different 'platforms': high end, low end, features, ...



Eclipse: Shared Resources

- 'Real' Library (.a, .lib)
 - Good for 'true' library
 - 'static', cannot configure at run time
- Folder outside project
 - Where?
 - Eclipse limitation (project view)
- Folder inside one project
 - In which project?
 - Using Project References?
 - What to use?
 - (Virtual Group with links)
 - Linked Folder

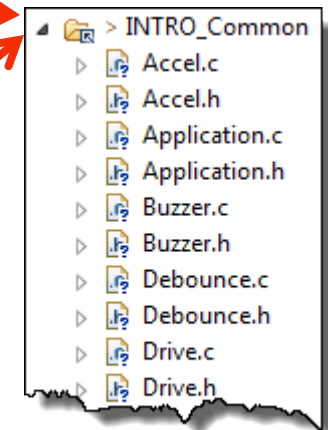
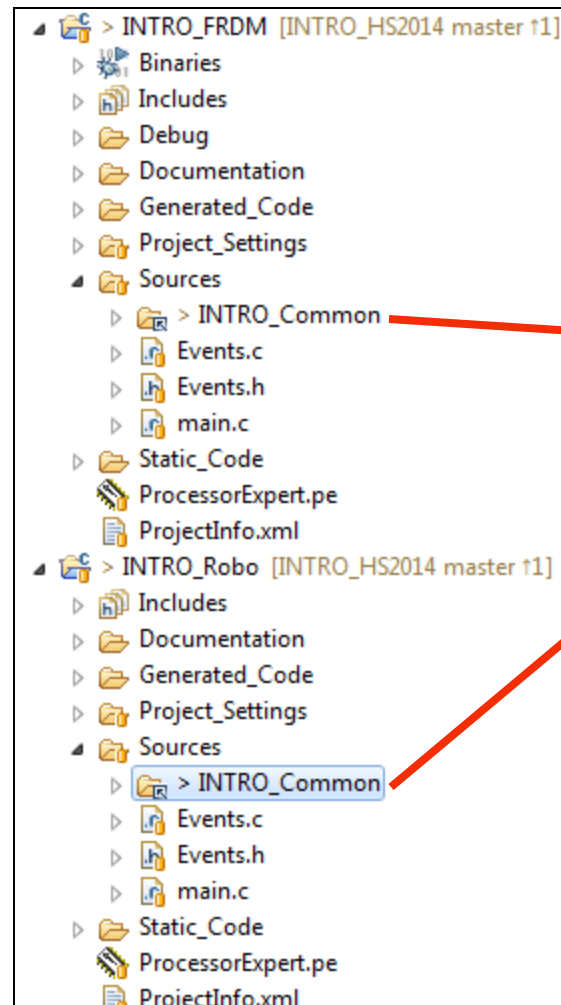
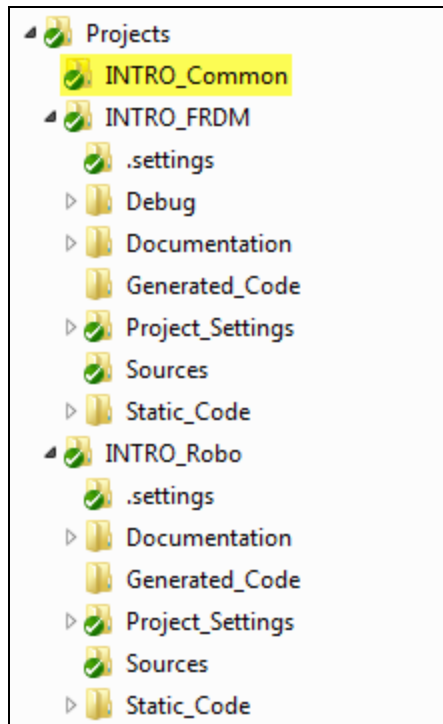
Linked Folder



Common Folder with Links

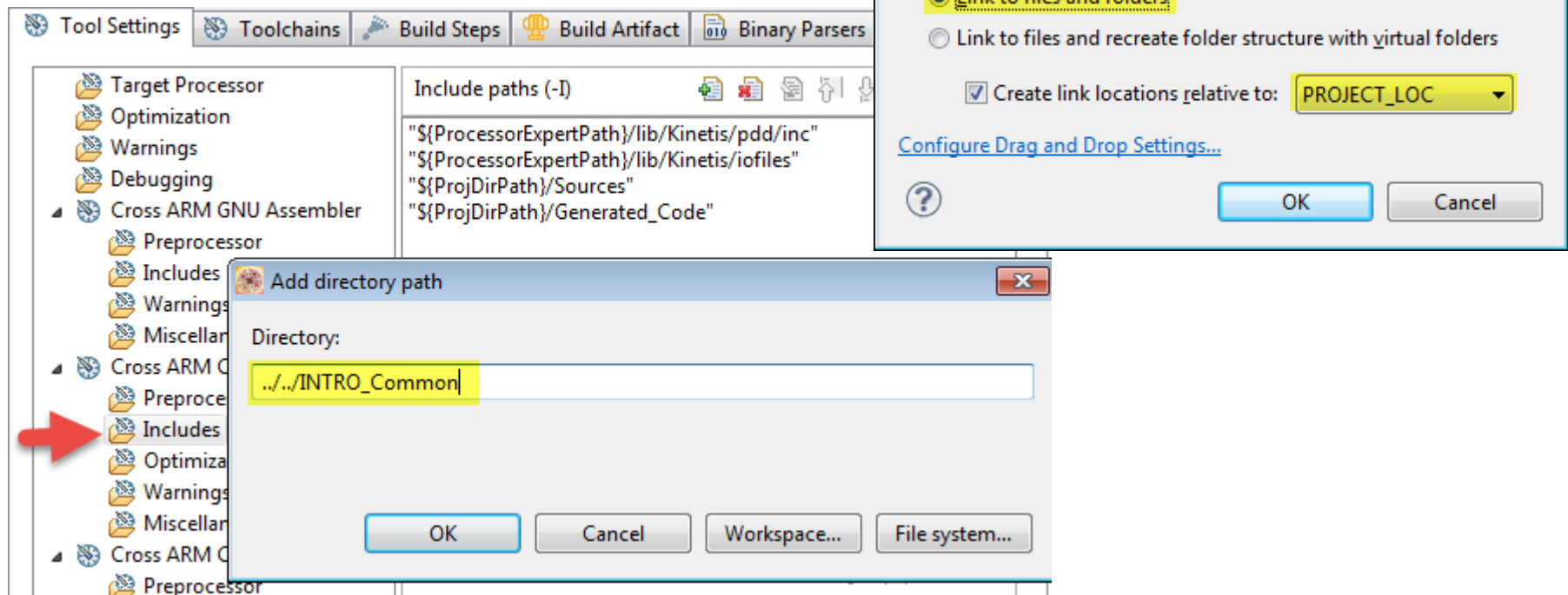
Eclipse:

Disk:



Eclipse: Linked Folder

- Instead of files, the folder is linked
- Drag & drop with CTRL key pressed
- Add path for build tools!



Summary

- Problem: Requirements and Project Organization

- Requirements (high level)
 - Essential/supportive
 - Functional/non-functional
- System Decomposition
- System Overview
- Directory Structure
- Project Organization
- Linked Folders
 - Compiler Include Paths

