Project Switchy

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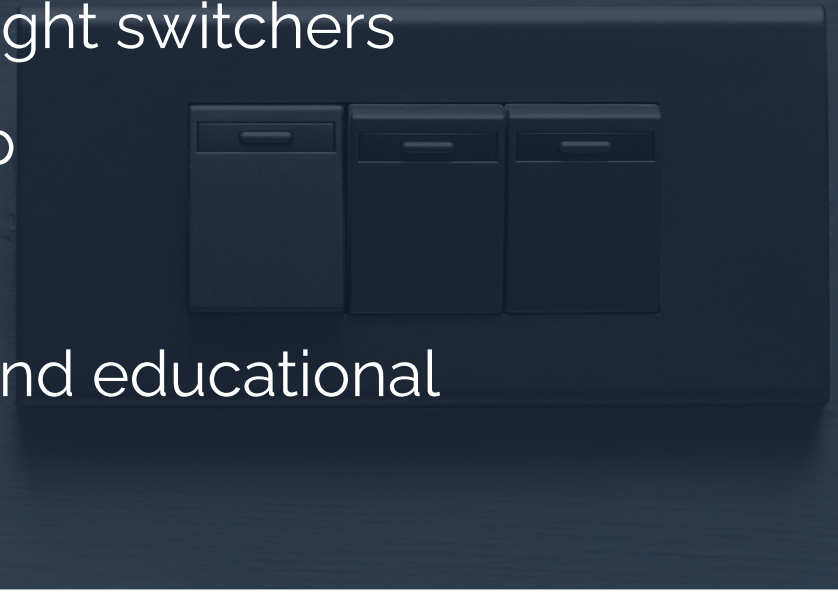
Motivation

- Remote-controlled light switchers
- Develop Android app
- Internet of things
- Simple, achievable and educational



Outline

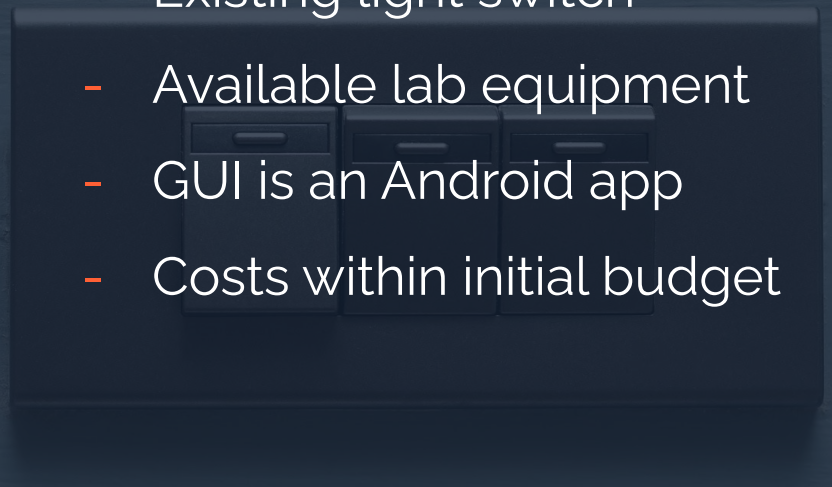
- Constraints and assumptions
- Functional description
- Timeline
- Budget
- Risks
- Testing
- Questions

Constraints

- Deadline: May 2021
- Max. budget: $400
- Microcontroller (MC)
- GUI on an operating system
- Wi-Fi between GUI and MC
- Surface-mount PCB
- 3D printed enclosure

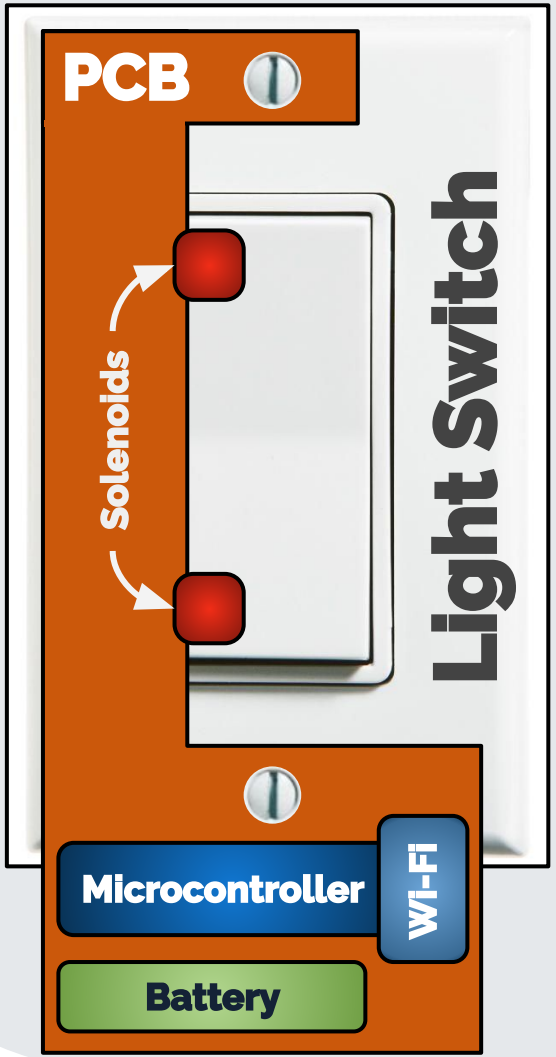
Assumptions

- Existing light switch
- Available lab equipment
- GUI is an Android app
- Costs within initial budget



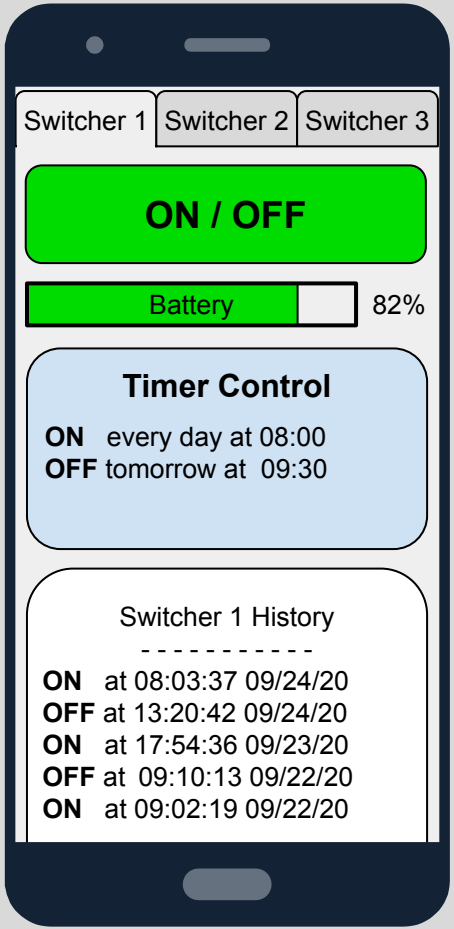
A Switcher

An example of what a Switcher *could* look like

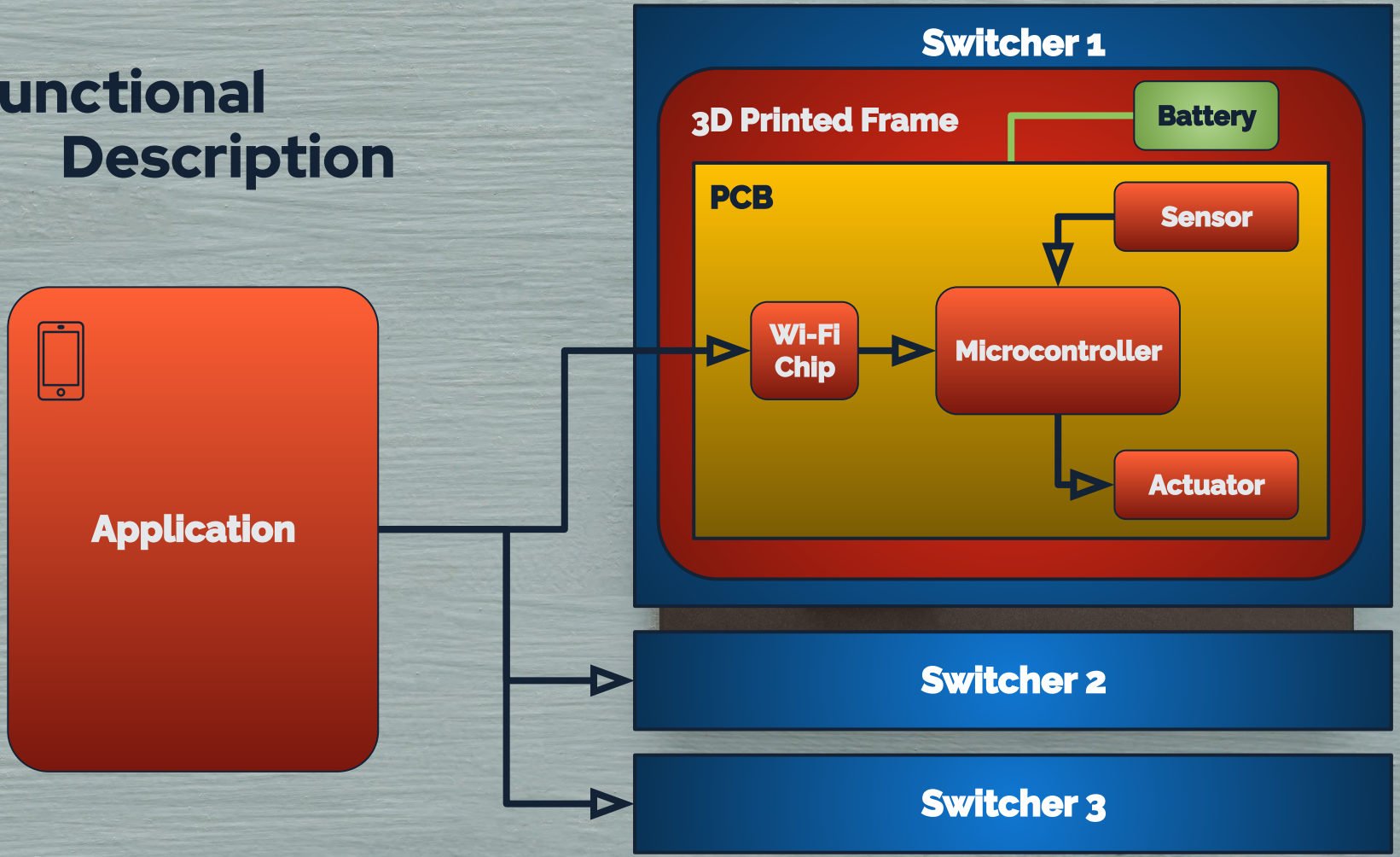


Android Application

I'll use free online software to develop an Android application

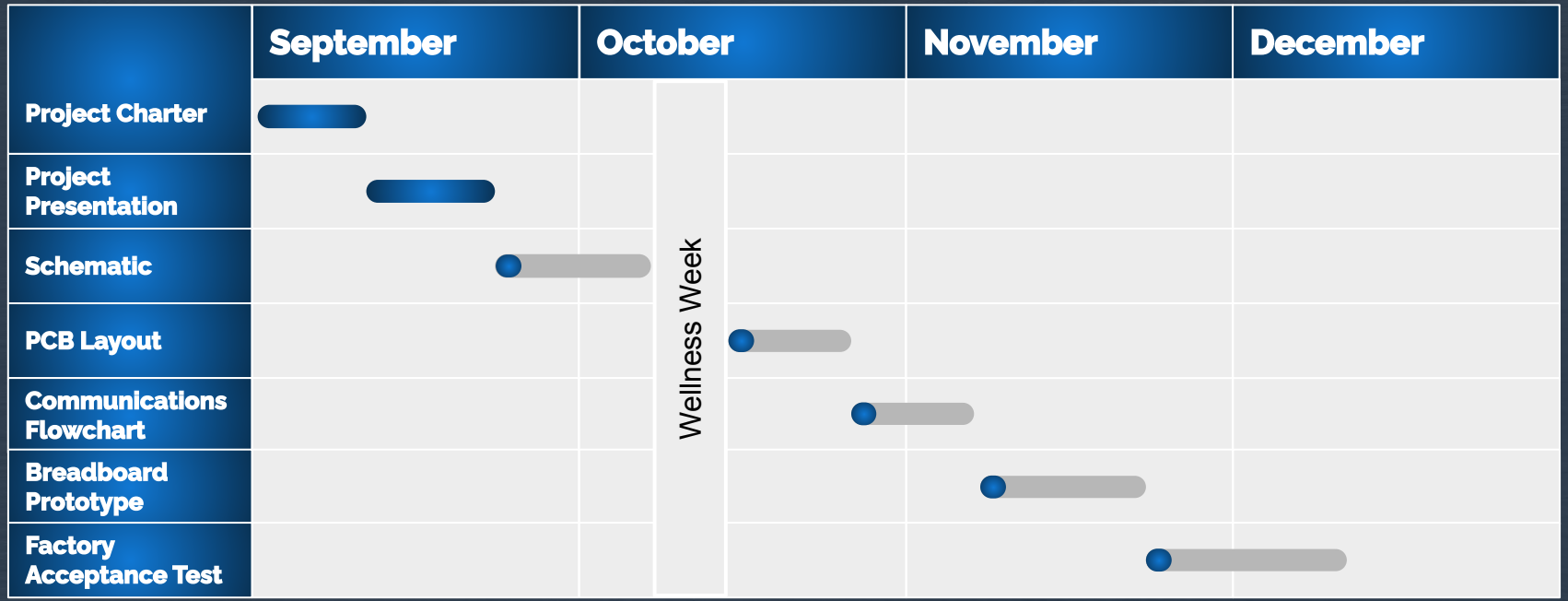


Functional Description



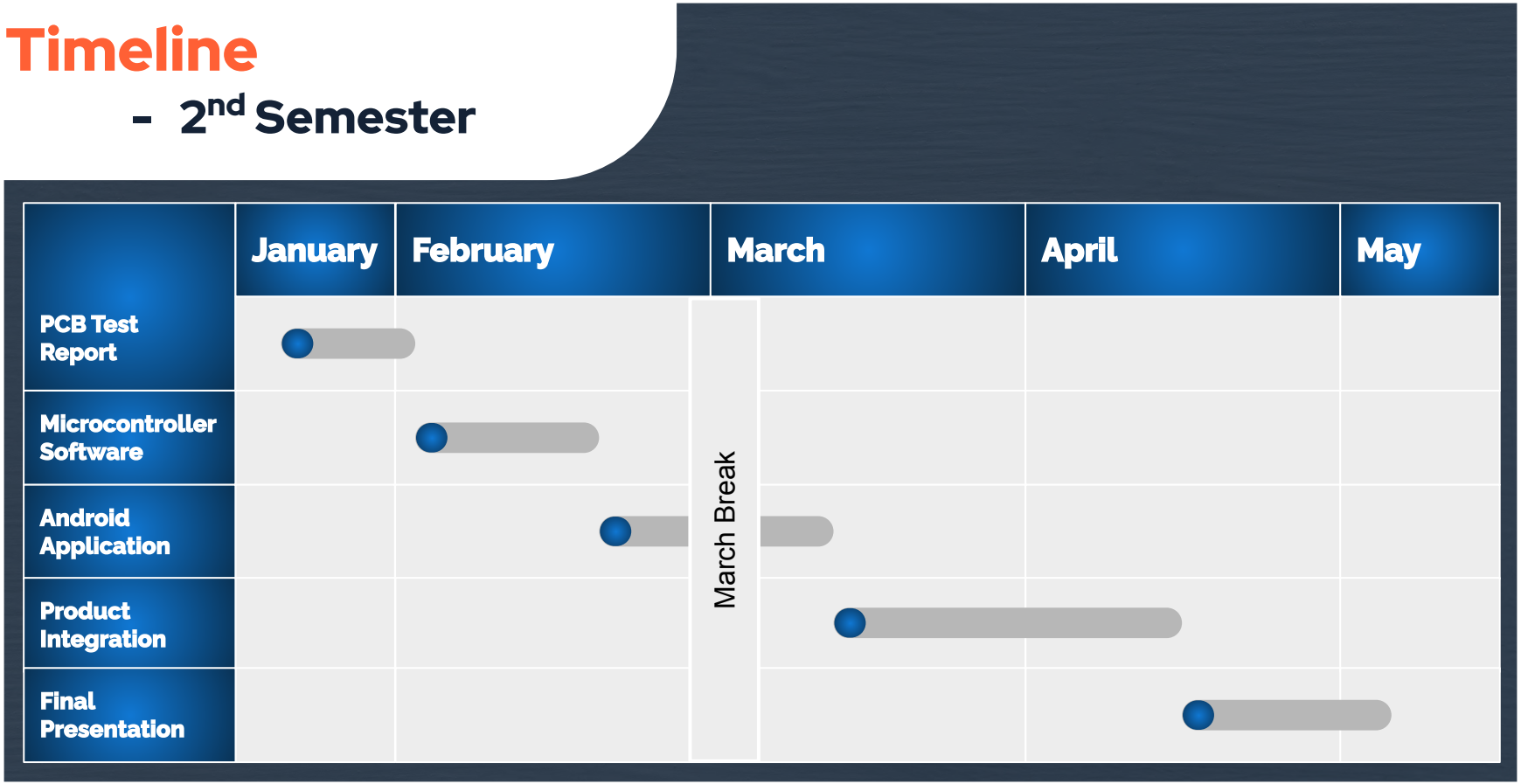
Timeline

- 1st Semester



Timeline

- 2nd Semester



Budget

Item	Quantity	Cost/item	Total Cost
Microcontroller	3	$5	$15
Physical Actuator	6	$3	$18
State Sensor	3	$5	$15
Battery	3	$5	$15
Battery management system	3	$3	$9
Wi-Fi card	3	$4	$12
Light switch	3	$3	$9
10 PCBs with components	1	$30	$30
3D printed enclosure	3	$0	$0
Contingency	10% of project cost		$12.30
Total			$135.30

Risks

- Security
- Battery overheating
- New to Android apps
- Heritage labs shutdown
- Shipping delayed

Testing

01	Real-time switching	• Switch successfully switched • Application records transition • Switchers controlled independently
02	Timer-controlled switching	• Switcher transitions at correct time • Application records transition
03	Manual switching	• Application records transition
04	Battery charges	• Battery charges over USB • Application displays charge percentage

My Questions

- ? Application development platform
- ? Security
- ? Switcher Design
- ? General advice