

Project Team

Ananth Prabhu
Francis Tran
Freddy Kooliyath
Hazel Monte de Ramos
Mirac Chen

PHARMA SORT Axis: Automatic Pill Dispenser

Contact: hmontede@sfu.ca
April 09 2018 - Spring 2018

SFU

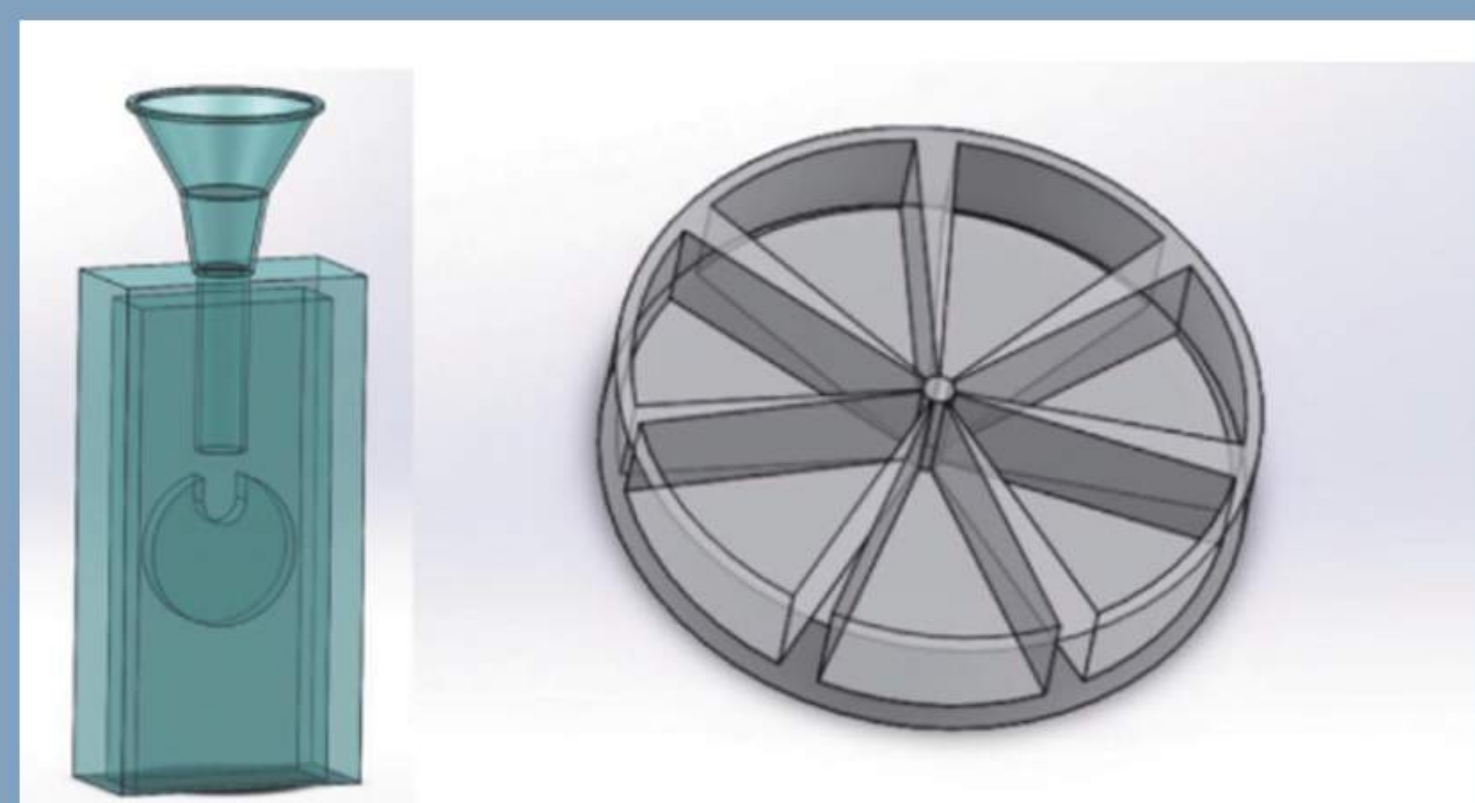
FACULTY OF
APPLIED SCIENCES

Introduction

- Our purpose: targeting the drug noncompliance issue in the senior demographic (and other disadvantaged groups)
- 40% to 75% are drug noncompliant
- Create a device that provides solutions for medication in organising, sorting and consumption
- Help older individuals with their medication intake

Proposed Solution: Axis

- Automatic pill dispenser
- Sorts pills for a week
- Standalone at-home device
- Avoids manual user sorting as seen in other products
- Uses a microcontroller to effectively communicate user input with the actuators that perform the dispensing and sorting

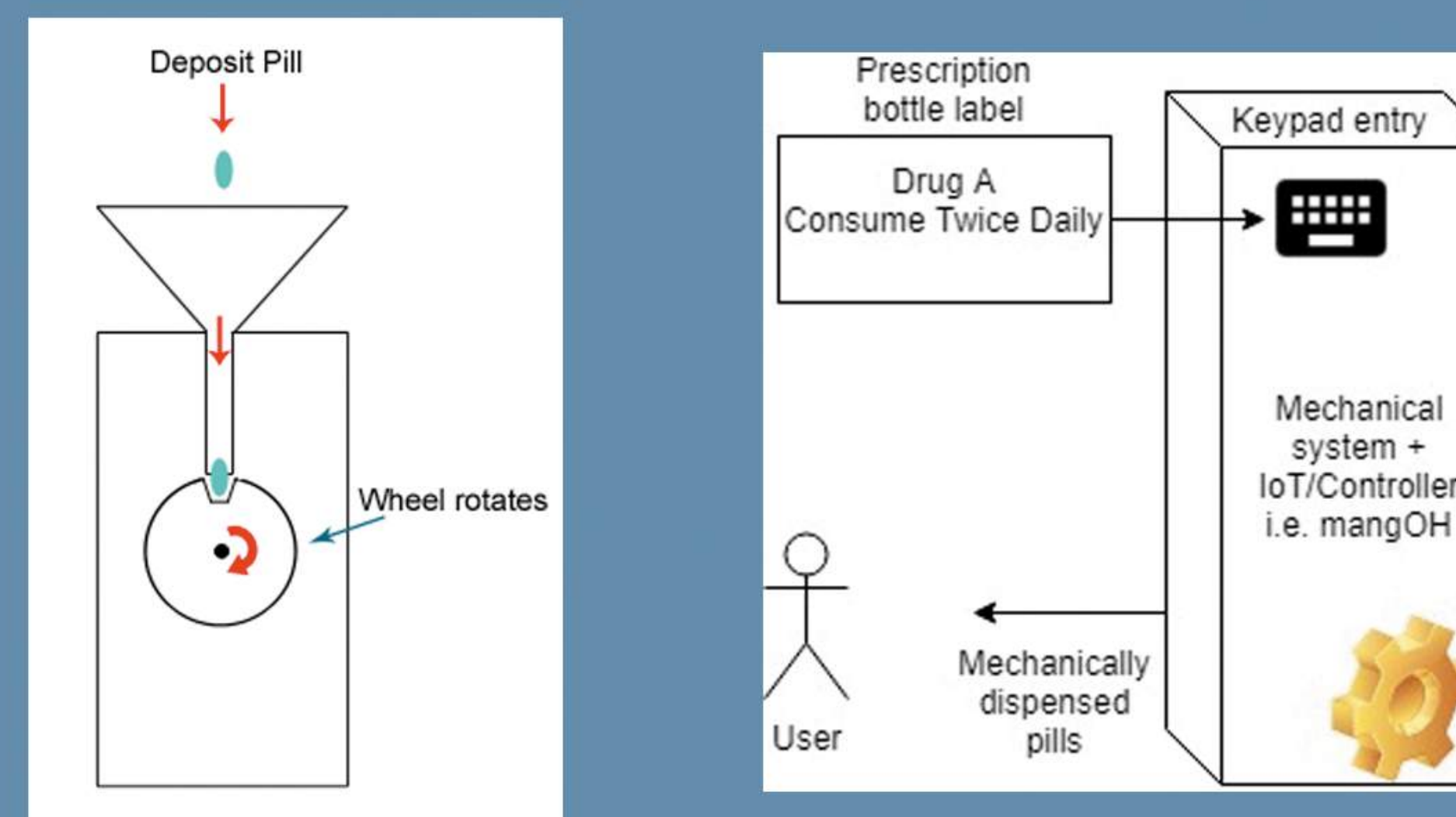


Market

- General senior population: 6.2 million in Canada as of 2017
- Caregivers and adult children of the elderly: 8.1 million caregivers with 48% caring for parents or parent-in laws

System Overview

- User empties pill bottle into opening
- LCD screen prompts instructions to determine dosage and frequency
- Keypad gives user ability to easily input required values
- Microcontroller actuates servo to begin pill dispensing, and stepper motor to rotate the compartmentalized base
- Excess pills are returned to user



Dispensing System

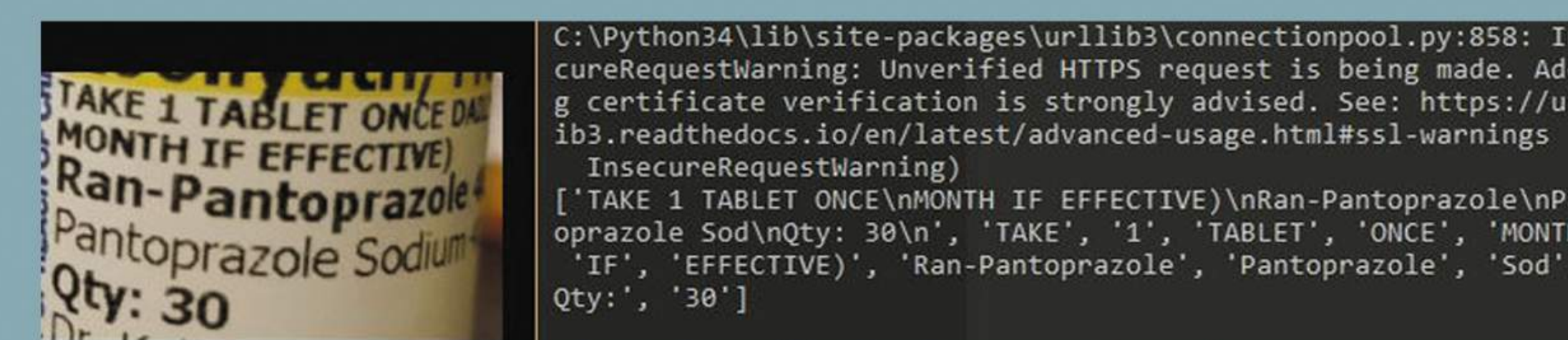
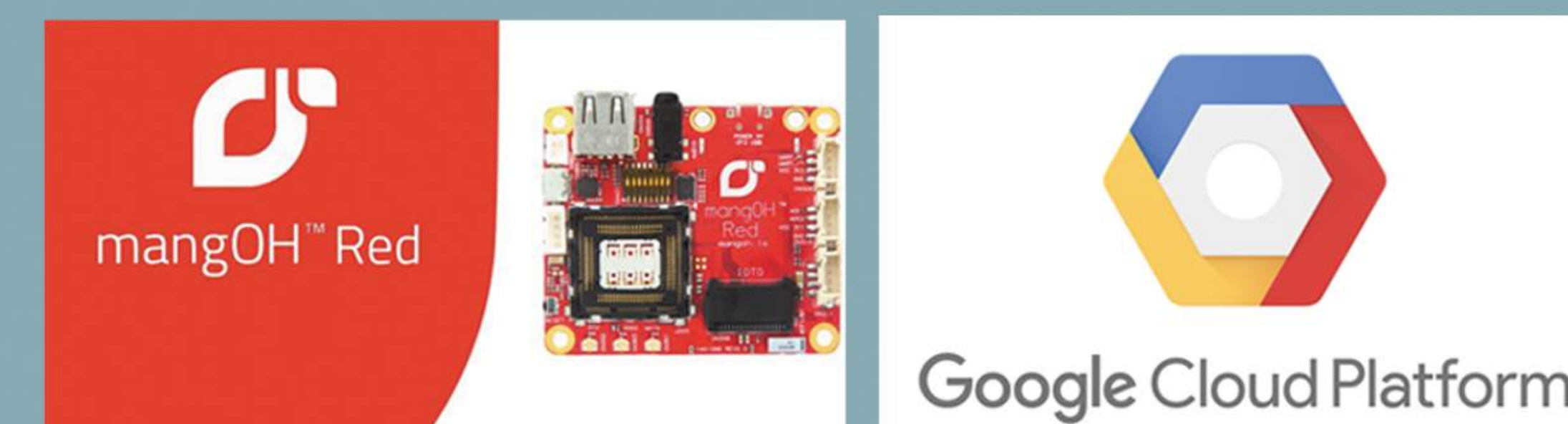
- Achieved through rotational apparatus that dispenses one pill at a time
- Apparatus is fixed above day compartment on base below

Rotational Base

- Divided into 7 compartments
- Powered by stepper motor
- Algorithmically connected to dispensing workflow

Future Plans

- Use Wi-Fi compatible mangOH board/ IoT platform
- Use camera sensor to capture label, eliminate keypad
- Google Cloud Vision Text Recognition API to convert to text
- Parsing algorithms to determine dispensing parameters
- On the fly statistics for pill compliance (can be sent to doctor)
- Alert systems to ensure pills are taken
- 3D Printed parts and encasing



Conclusion

- Axis will revolutionize the at-home pharmaceutical solutions
- Growing senior population ensures promising market
- Internet of Things integration enables statistics and tracking
- Friendly interface for seniors and caretakers
- Cost effectiveness and government subsidies are plus points