



# MOBILE MEDICATION ALERT SYSTEM

ENSC 305W/440W Final Presentation  
Simon Fraser University  
Dec 12<sup>th</sup> , 2012

Presented by: Fan Yang  
Li Xiang  
Kevin Wang  
Steven Verner  
Freda Feng

# Outline



Introduction



System Overall



System Specification



Business & Marketing



Timeline & Budget



Future Work



Conclusion



Questions

# Introduction



**SmartMed Team Members**



**Background Information**



**Motivation**

# Introduction

## ➤ SmartMed Team Members

### *SmartMed Corporated*

- ❖ *Fan Yang --- CEO*
- ❖ *Freda Feng --- CFO*
  - ❖ *Li Xiang --- COO*
- ❖ *Steven Verner --- CDO (Mobile)*
- ❖ *Kevin Wang --- CDO (Hardware)*

# Introduction

## ➤ Background Information



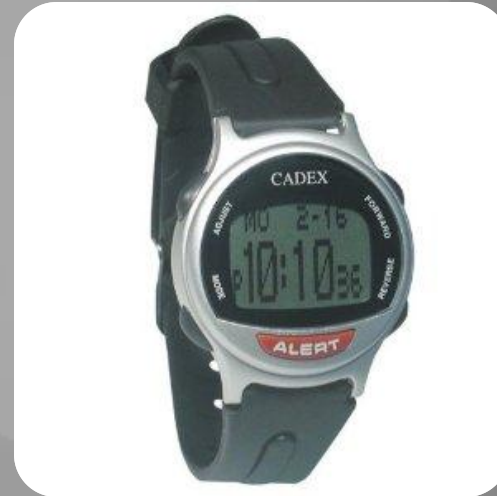
Have you take your medicine on time?

# Introduction

## ➤ Motivation



+



**More Convenient !  
More Economical !  
More Intelligent !**

# System Overview



**System Function Block  
Diagram**



**System Mechanism Diagram**



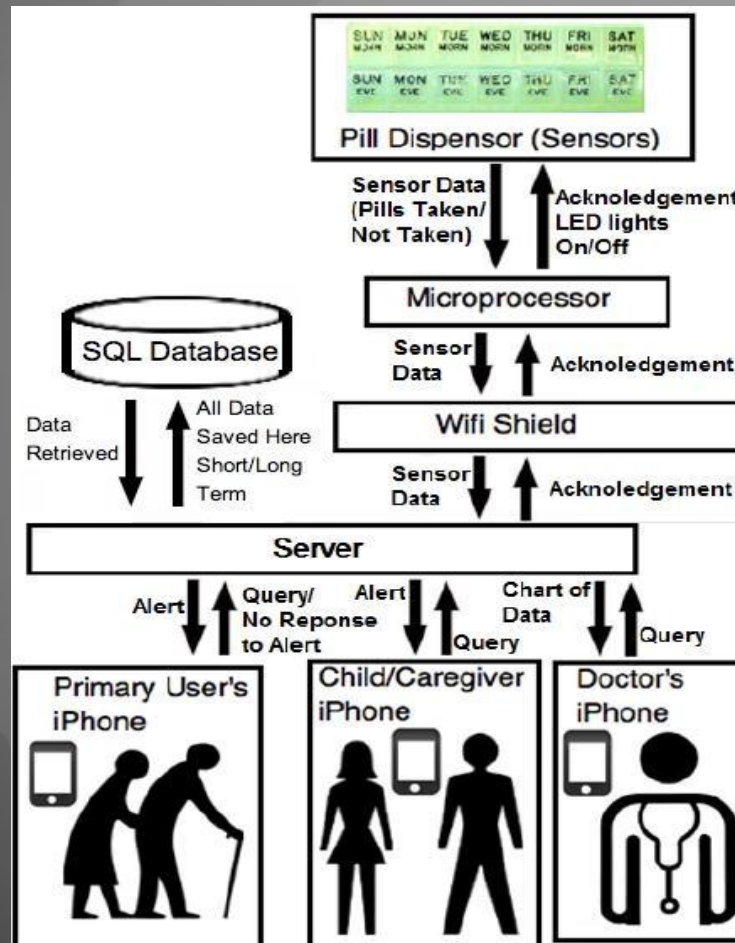
**High Level Functional  
Demonstration**



**System Test Result**

# System Overview

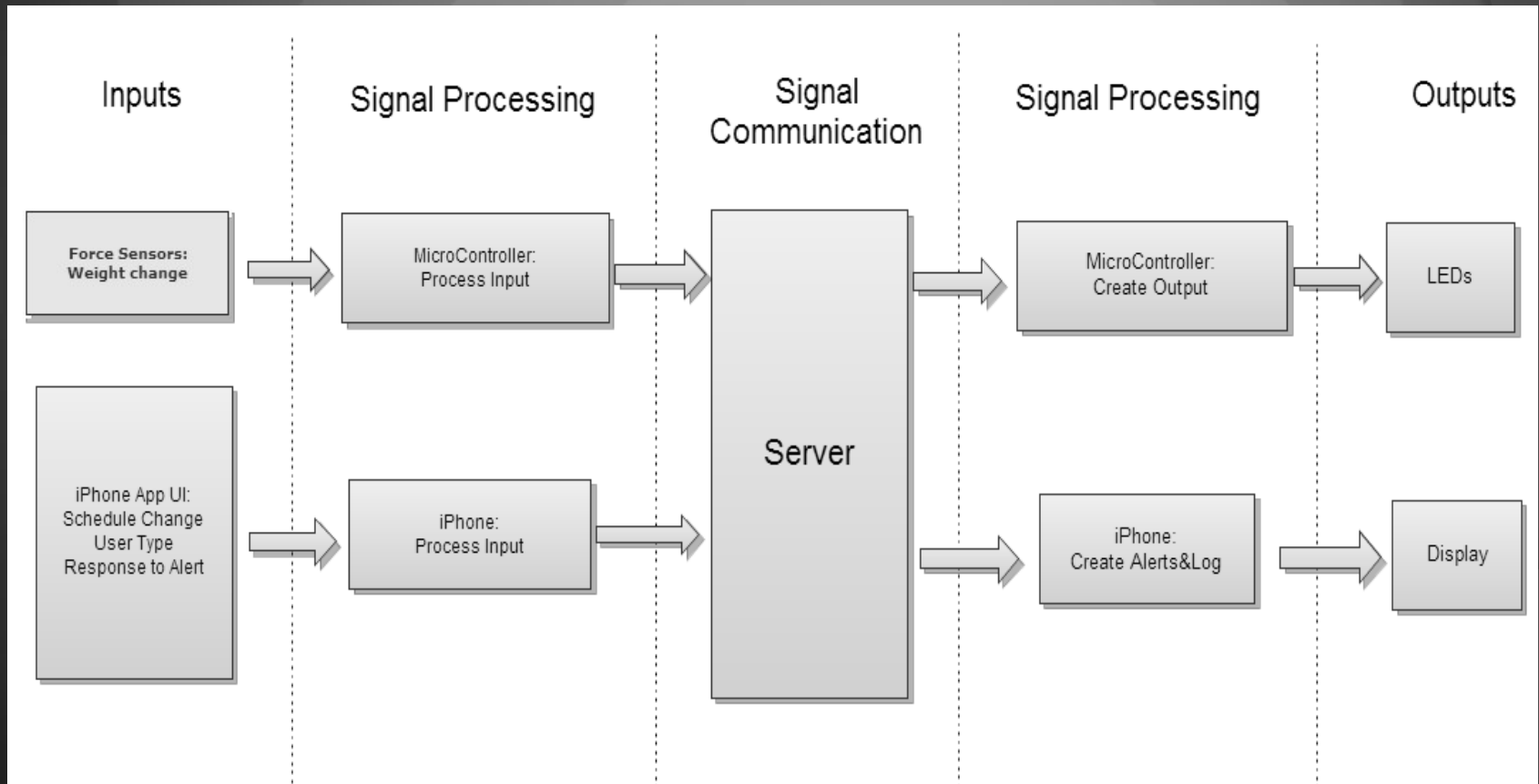
## ➤ System Function Block Diagram





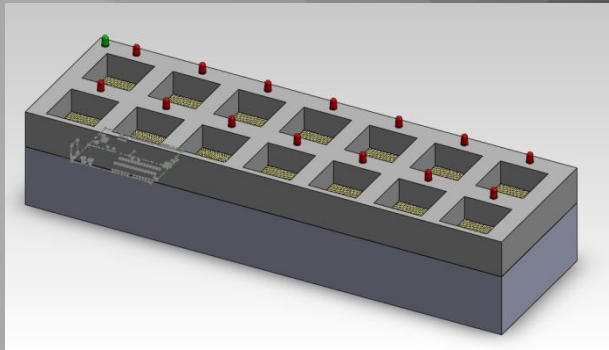
# System Overview

## ➤ System Mechanism Diagram



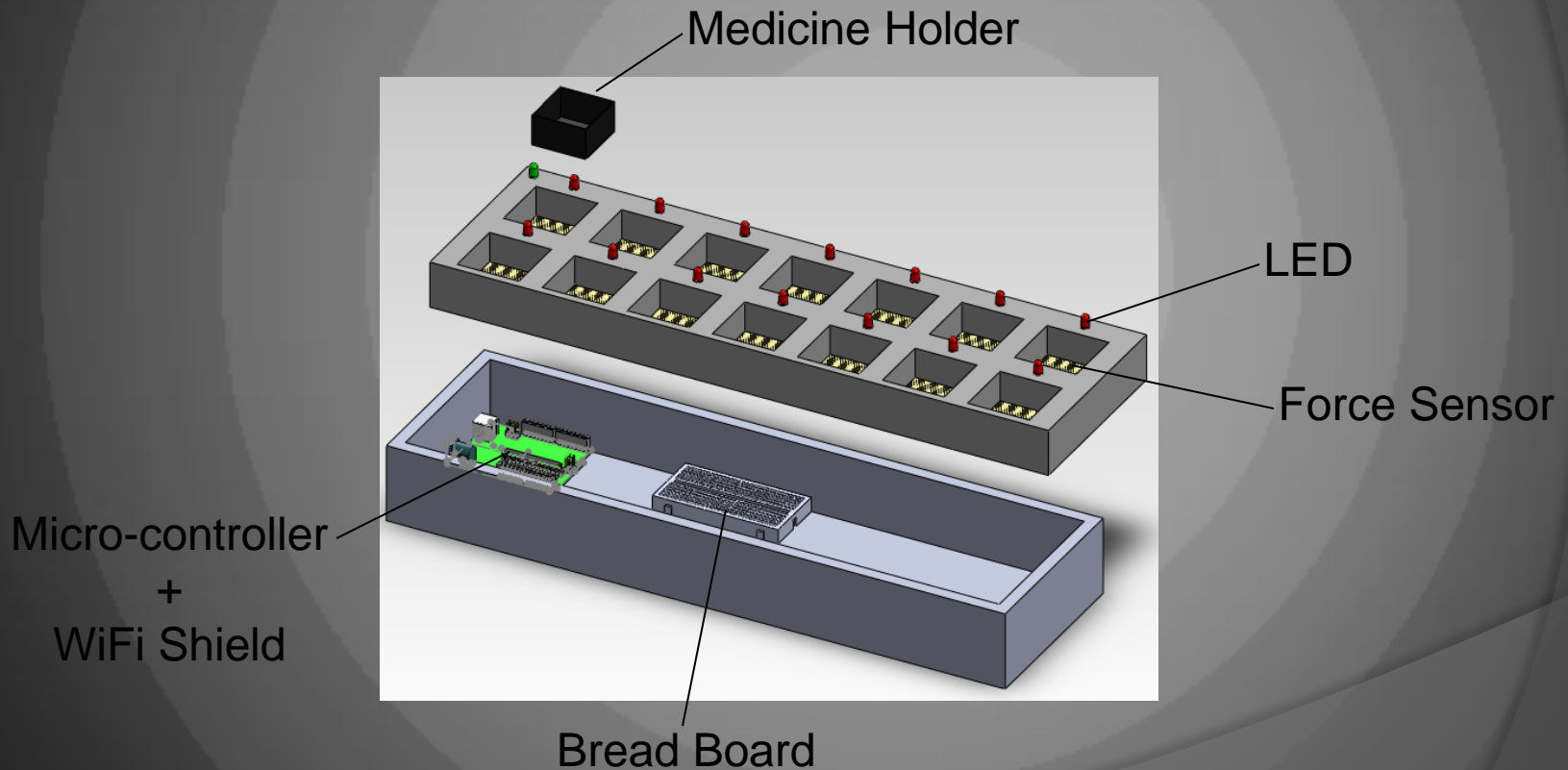
# System Overview

## ➤ High Level Functional Demonstration



# System Overview

## ➤ Prototype Design



# System Overview

- **System Test Result**
  - **Communication between microcontroller and server, or server and app is pass**
  - **The connection between LEDs and force sensors is pass**
  - **There is communication delay from sensor detecting signals to iPhone receiving signals**

# System Specifications



**Mobile App**



**Server**



**User Interface**

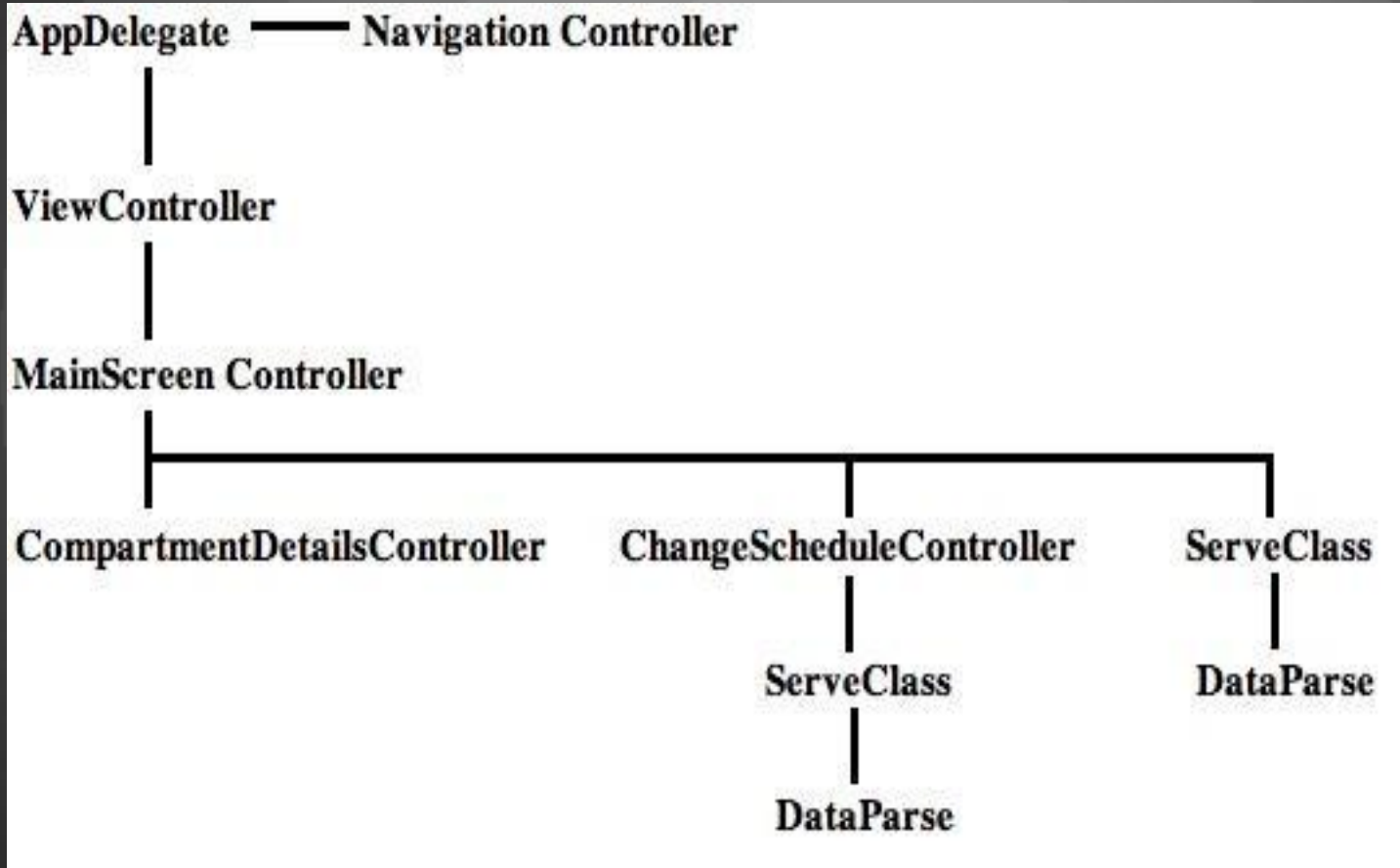


**Hardware**

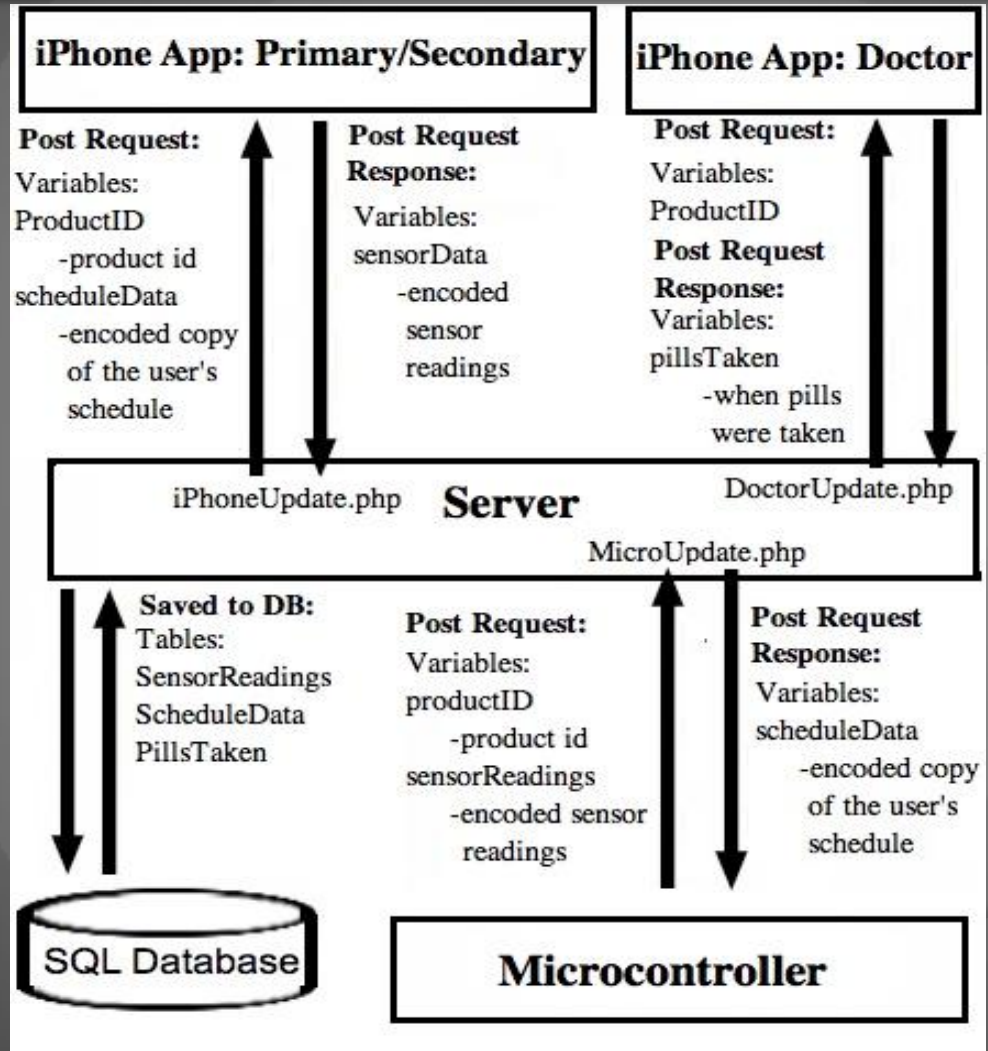


**Microcontroller**

# Mobile App



# Server

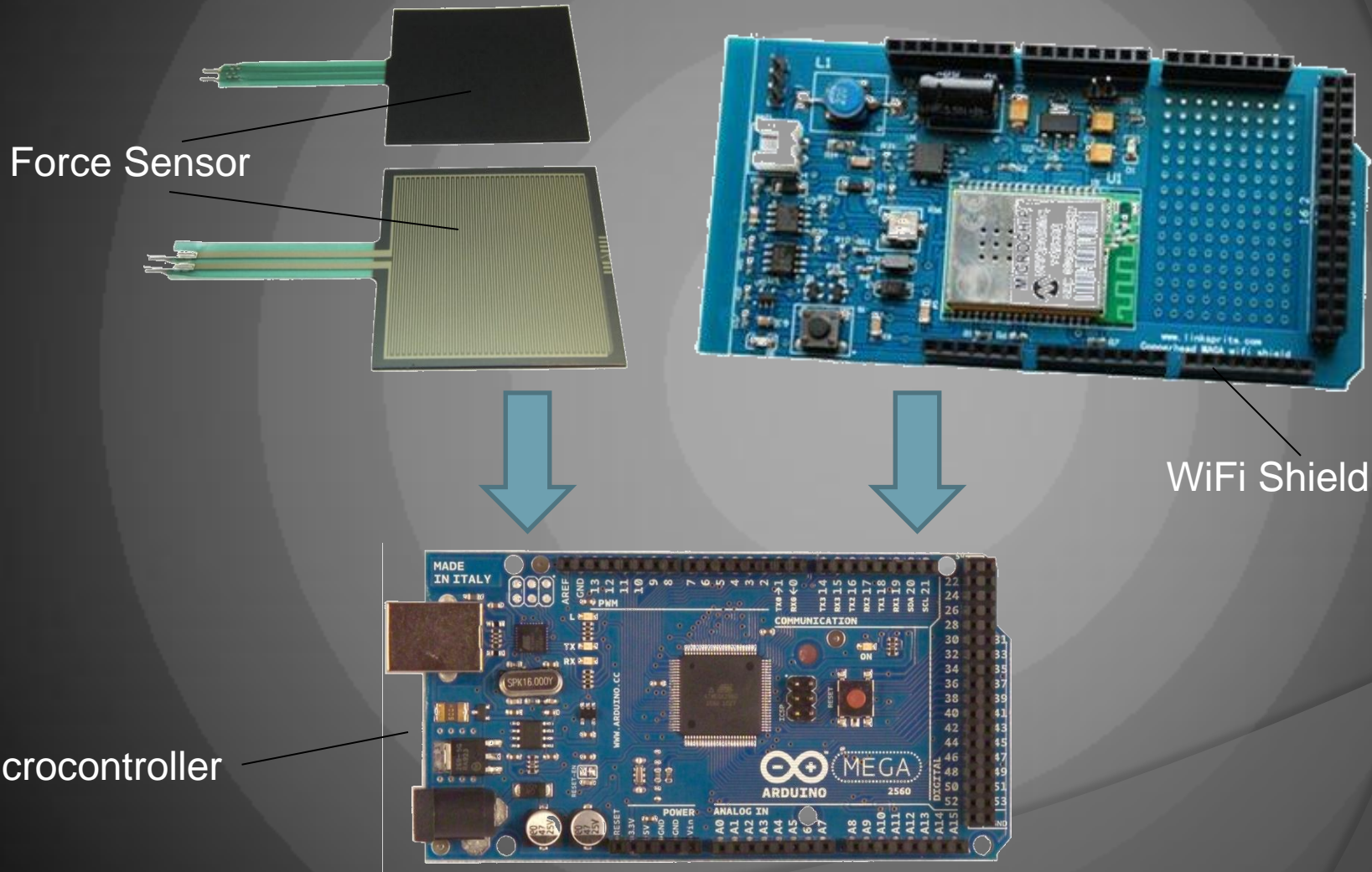


# User Interface

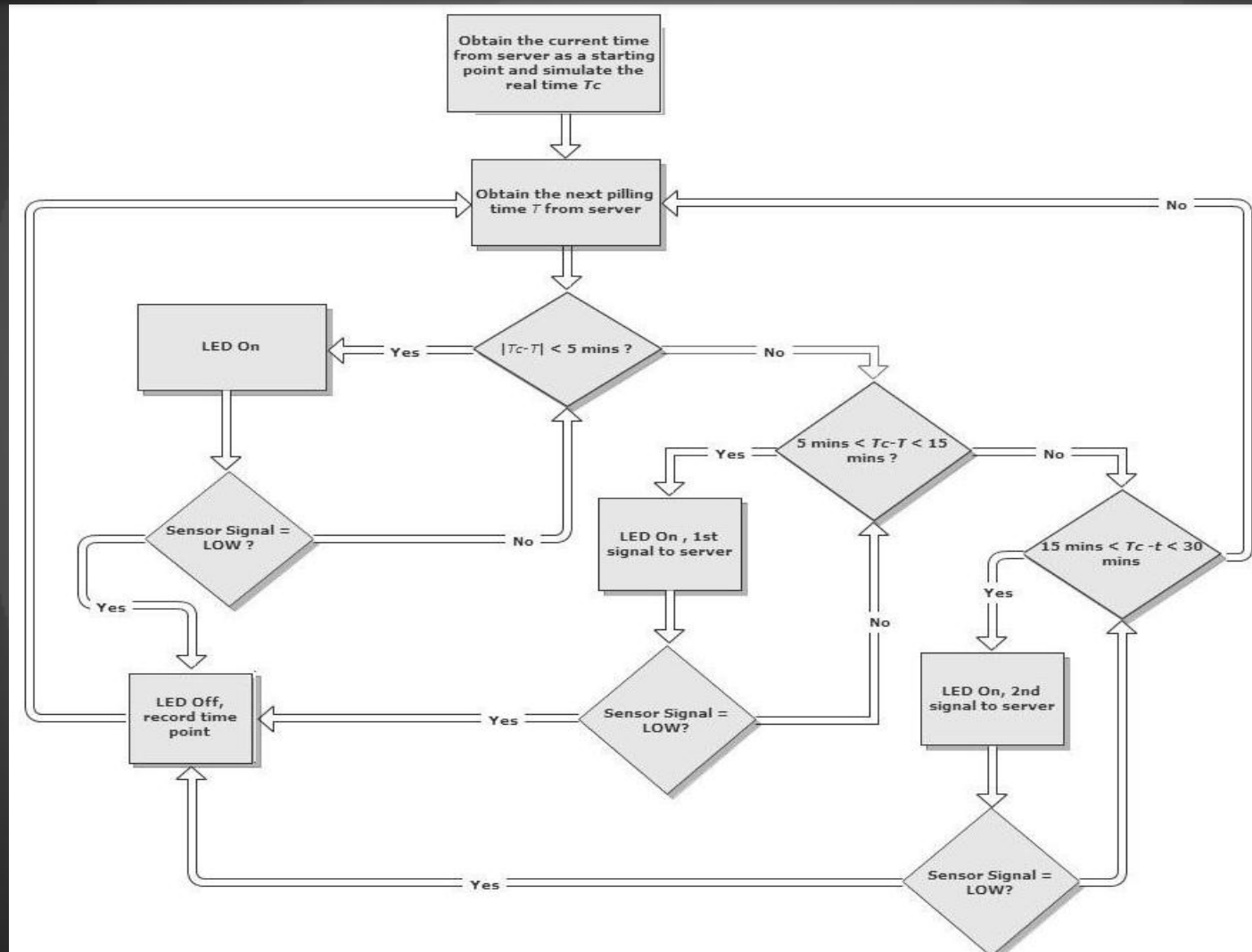




# Hardware



# Microcontroller



# Business & Marketing



**Market Research**



**Price Analysis**



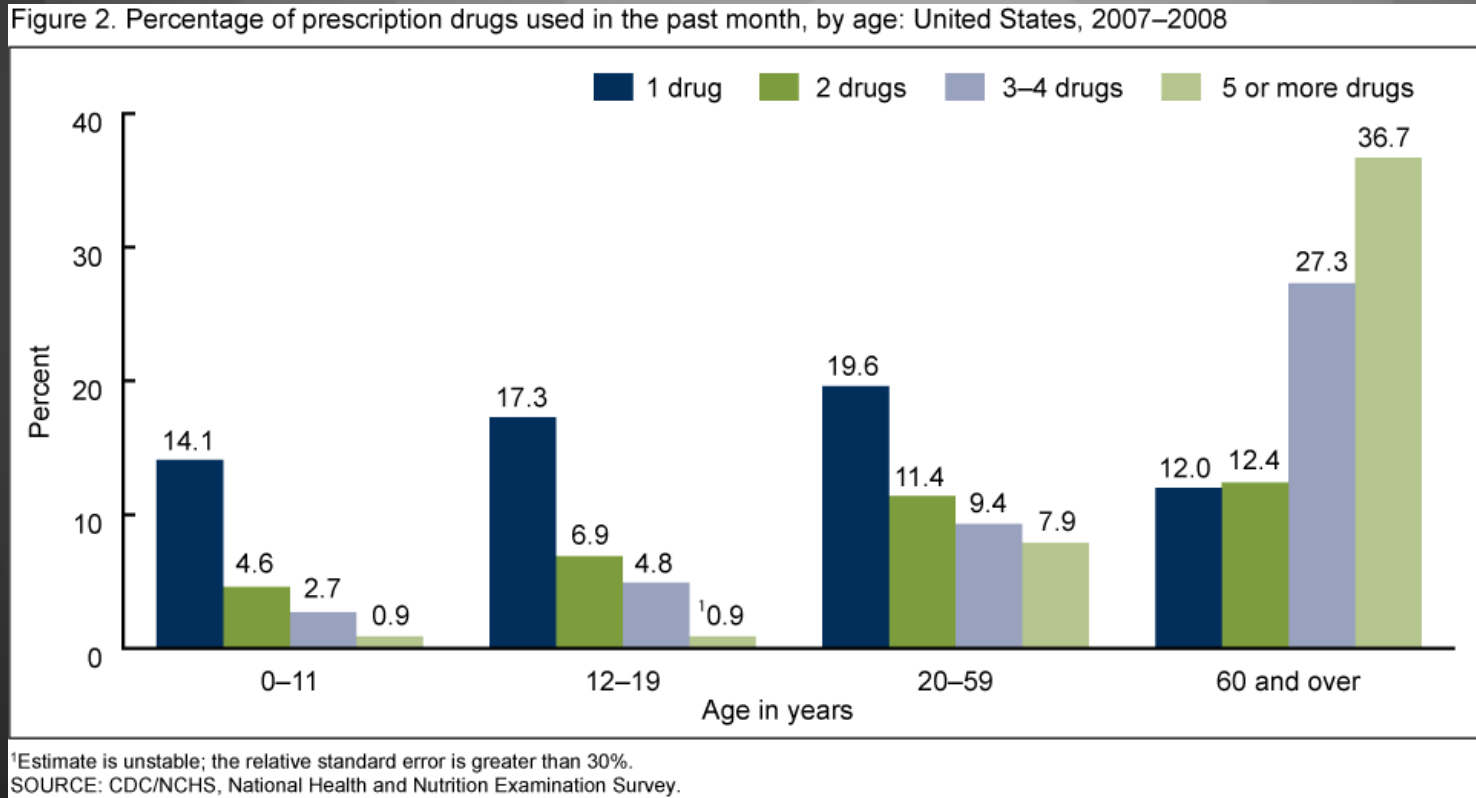
**Competitors**



**Safety & Sustainability**

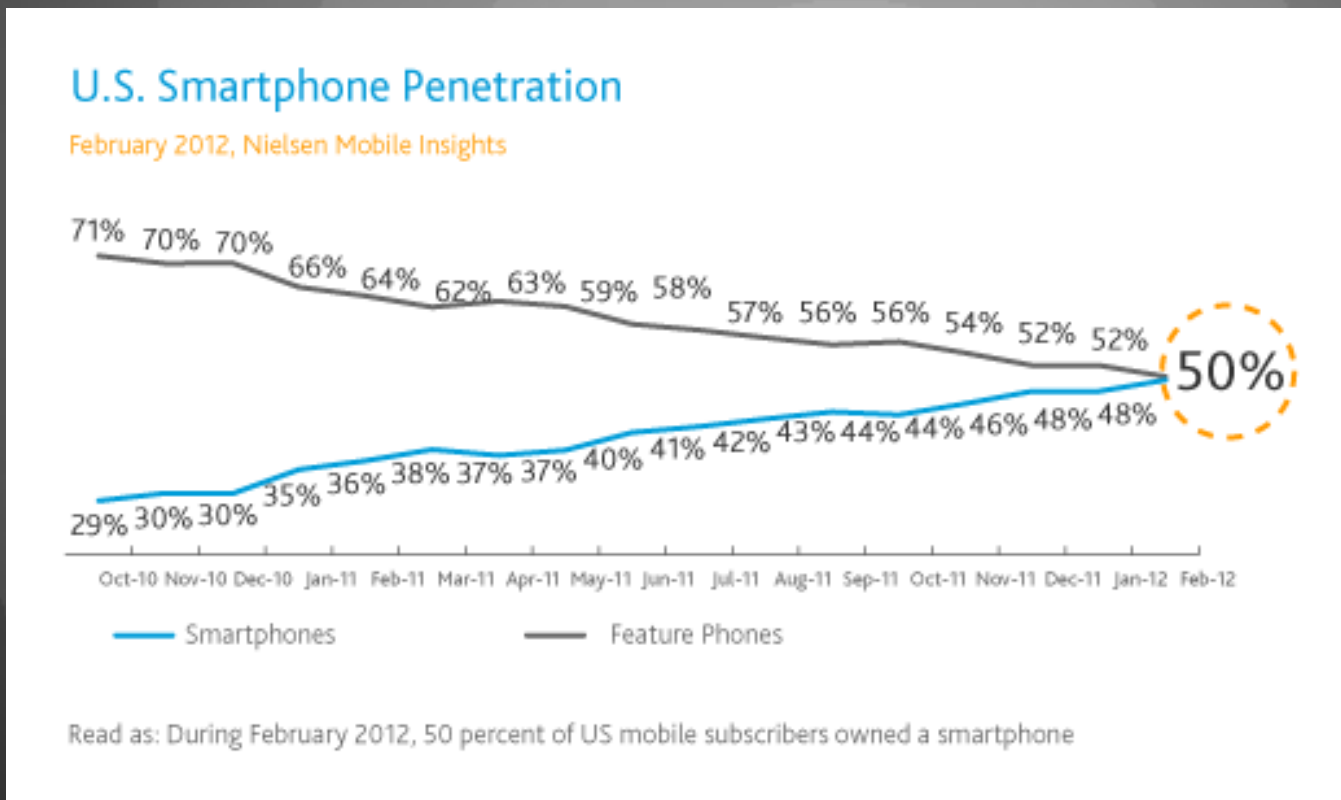
# Market Size

- The elderly often have multiple disease states and/or chronic conditions
- Approximately 60% of elderly don't take the medications according to the doctors' orders



# Market Size

- Average annual income for North America is around \$50,000
- Smart phone is more and more popular



# Price Analysis

Component	Unit Price	Mass Production
Micro-controller	\$ 38	\$ 12
Wi-Fi Shield	\$ 93	\$ 35
Force Sensor	\$ 121	\$ 50
LEDs	\$ 6	\$ 1
Cable & Kits	\$ 30	\$ 5
Labor	\$ 750*	\$ 50**
<b>Total cost</b>	\$ 1038	\$ 149
<b>Retail Price***</b>	\$ 1500	\$ 225

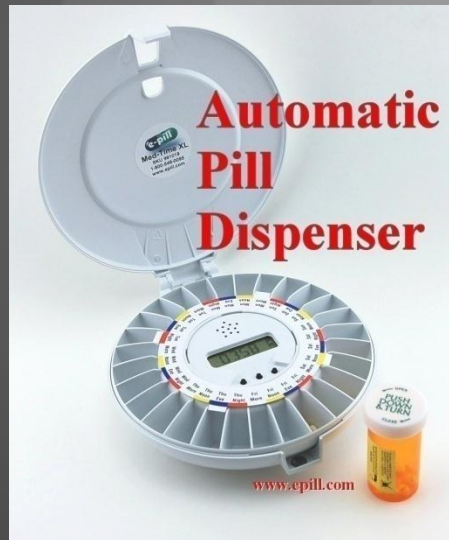
\* Labor for an unit: 30hours X \$25/hour = \$ 750

\*\* Labor for Mass Production: 2hours X \$25/hour = \$ 50

\*\*\* Retail Price  $\approx$  (1+50%) Total Cost

# Competitors

- There are two options for organizing daily medications:
  - Traditional weekly plastic pillbox
  - Electronic version of the weekly pillbox.



\$ 400.00



\$ 900.00

# Safety & Sustainability

## ➤ Safety

- All electrical components inside pill dispenser
- Medicine holder has no harm for the pills

## ➤ Environmental Consideration

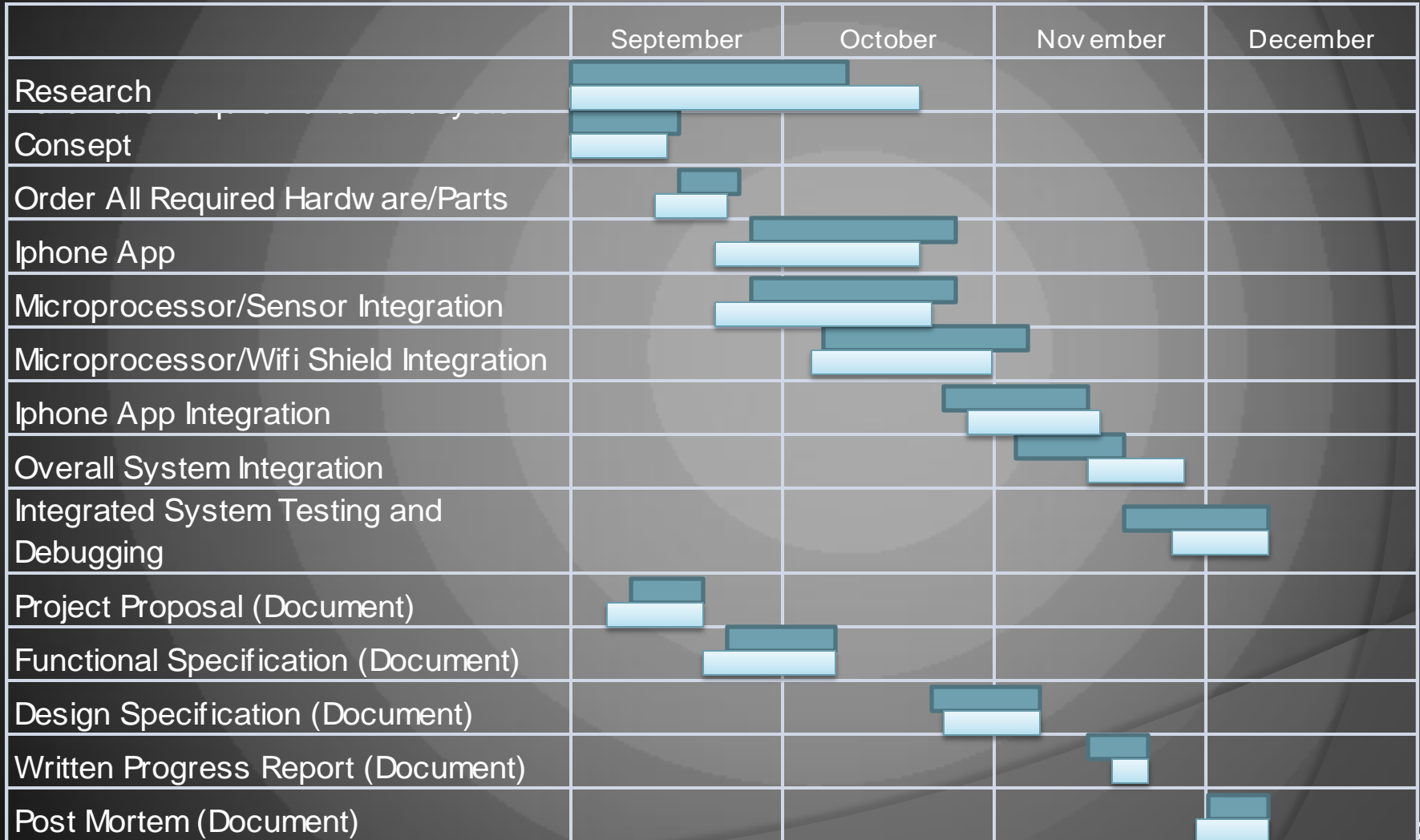
- Electrical Components
- Wooden Kits
- LEDs and Force Sensors



# Budget

Component	Brand & Model	Unit	Proposed Price	Actual Price	Deviation
Micro-controller	Arduino Mega	1	\$ 35	\$ 38	-\$ 3
Wi-Fi Shield	Arduino WiFi Shied (Integrated Antenna)	1	\$ 100	\$ 93	\$ 7
Force Sensor	Interlink Electronics FSR 406	14	\$ 161	\$ 121	\$ 40
Color Sensor	Parallax ColorPAL-Color and Light Sensor	14/0	\$ 210	0	\$ 210
LEDs		0/15	0	\$ 6	- \$ 6
Cable & Kits	N/A	--	\$ 100	\$ 30	\$ 70
<b>Total</b>			<b>\$ 606</b>	<b>\$ 288</b>	<b>\$ 318</b>

# Timeline



# Future Work

- **Sensitivity of the force sensors**
- **Design of the pill dispenser**
  - **Material**
  - **Size**
  - **Locks**
- **System suitable for other type of smart phone**
- **Communication setup**
- **Improve the problem of communication delay**

# Conclusion

- **Prototype build on time and within budget**
- **Achieve the majority of functions**
- **Future works needed to make it better**
- **Great experience during our teamwork**

# Acknowledgement

- ❖ Dr. Andrew Rawicz
- ❖ Steve Whitemore
- ❖ Ali Ostadfar
- ❖ Jamal Bahari
- ❖ Michelle Cua
- ❖ Fred Heap

# Questions

