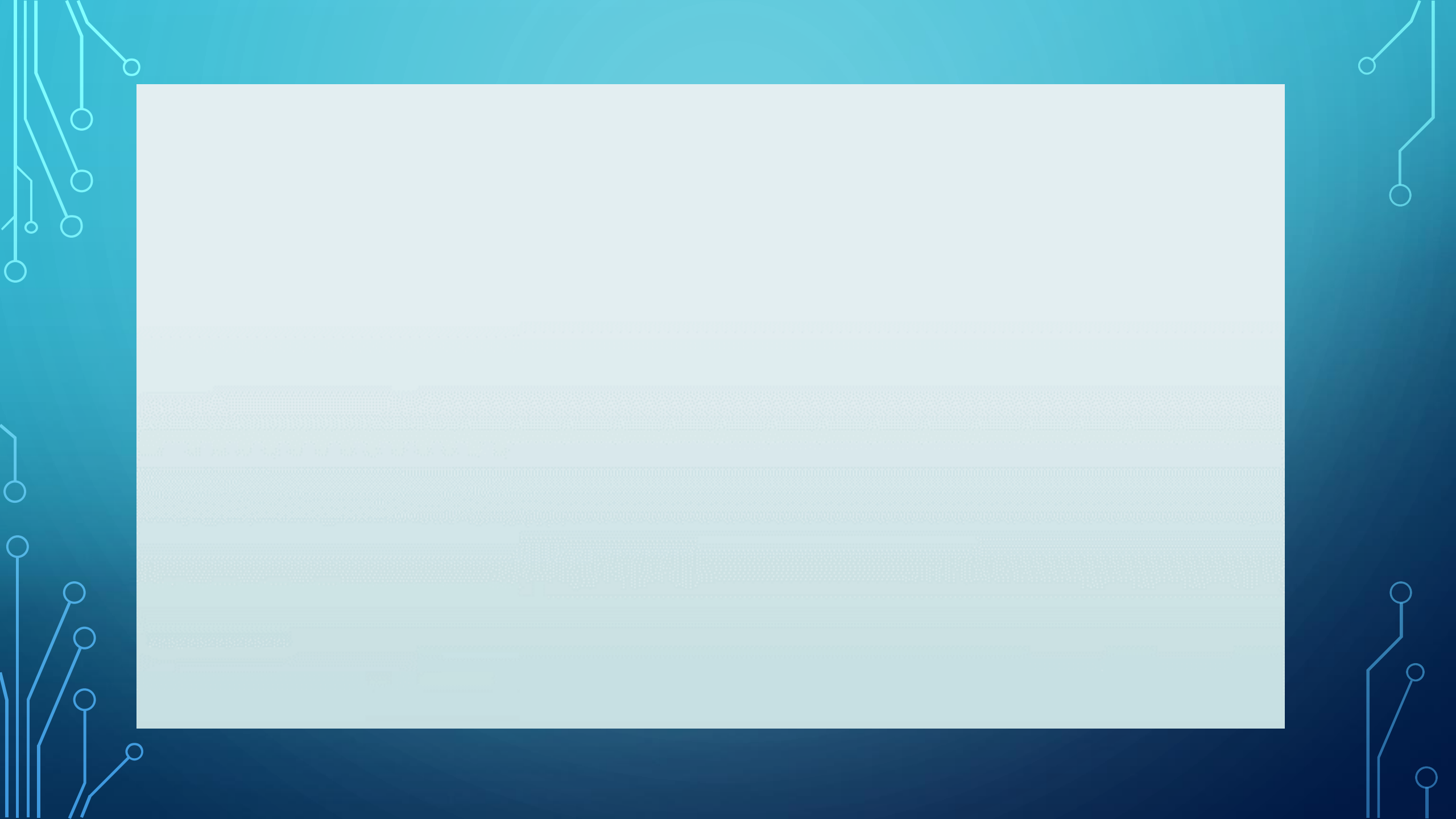# BABY ROCK – SMART BABY CRADLE

GROUP 20

MEET THE TEAM

- Fanchao Meng (Randy) – Chief Executive Officer

- Xiaoye Lu (Eric) – Chief Technology Officer

- Yu Liu (Nick) – Chief Financial Officer

- Kiru Sri – Chief Information Officer

BACKGROUND
&
PURPOSE

FUNCTIONS

Rocking

- A stepper Motor rotates back and forth

- We used two gears to amplify torque

- Controlled by microcontroller

  - Arduino Mega

FUNCTIONS

Monitoring

- We used an ArduCam

- Allows for real time video monitoring

  - We couldn't decode video

FUNCTIONS

Cry Recognition

- A Microphone Shield was used to assist the microcontroller

- Sound Database

- Sound is received by Microphone

- Voice Recognition Software

FUNCTIONS

Comforting

- Uses Microphone shield to play Audio

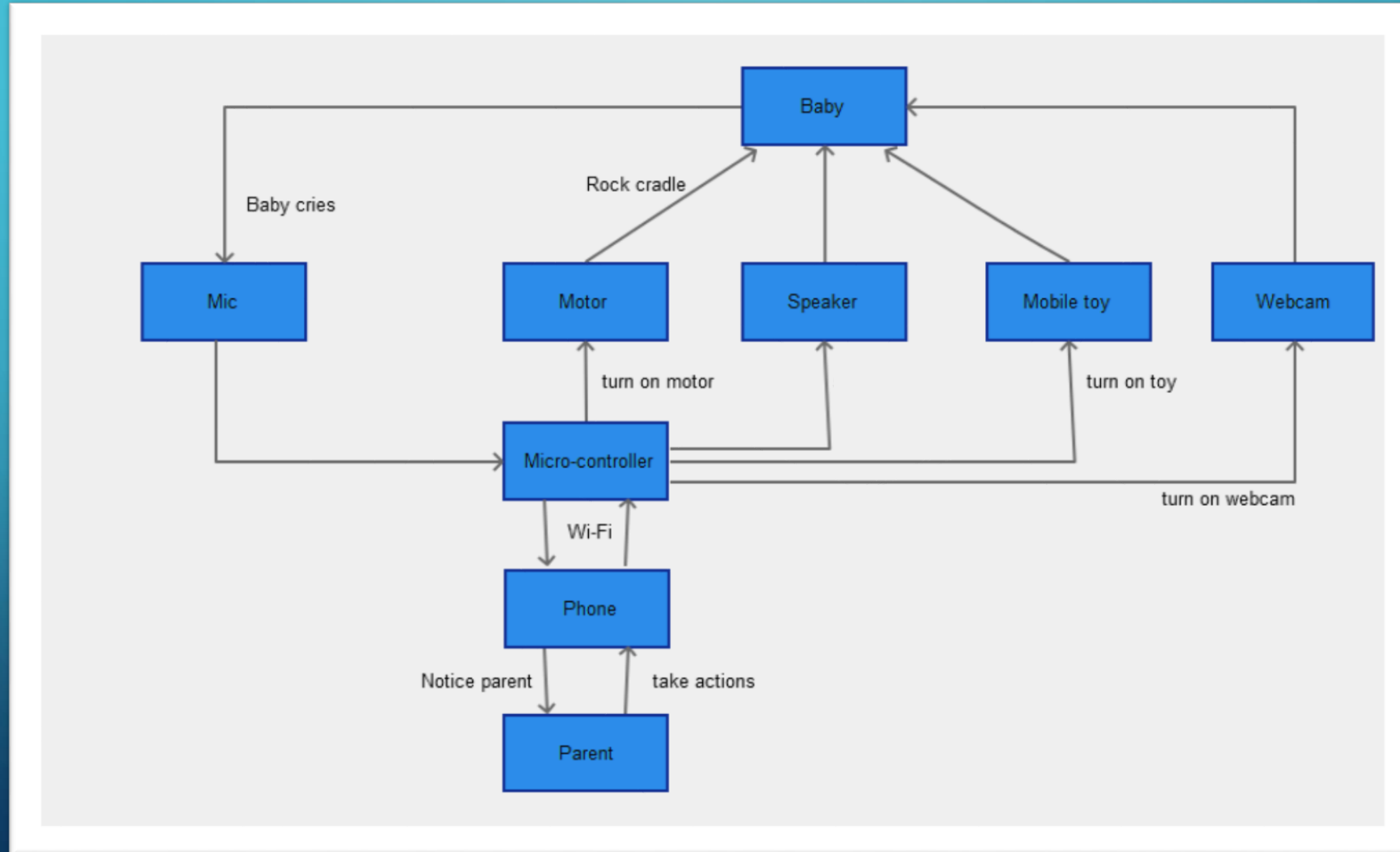- Audio is controlled by Android App

FUNCTIONS

Android Application

- It allows parents to control the previous functions

- Receives Notification when the baby is Crying

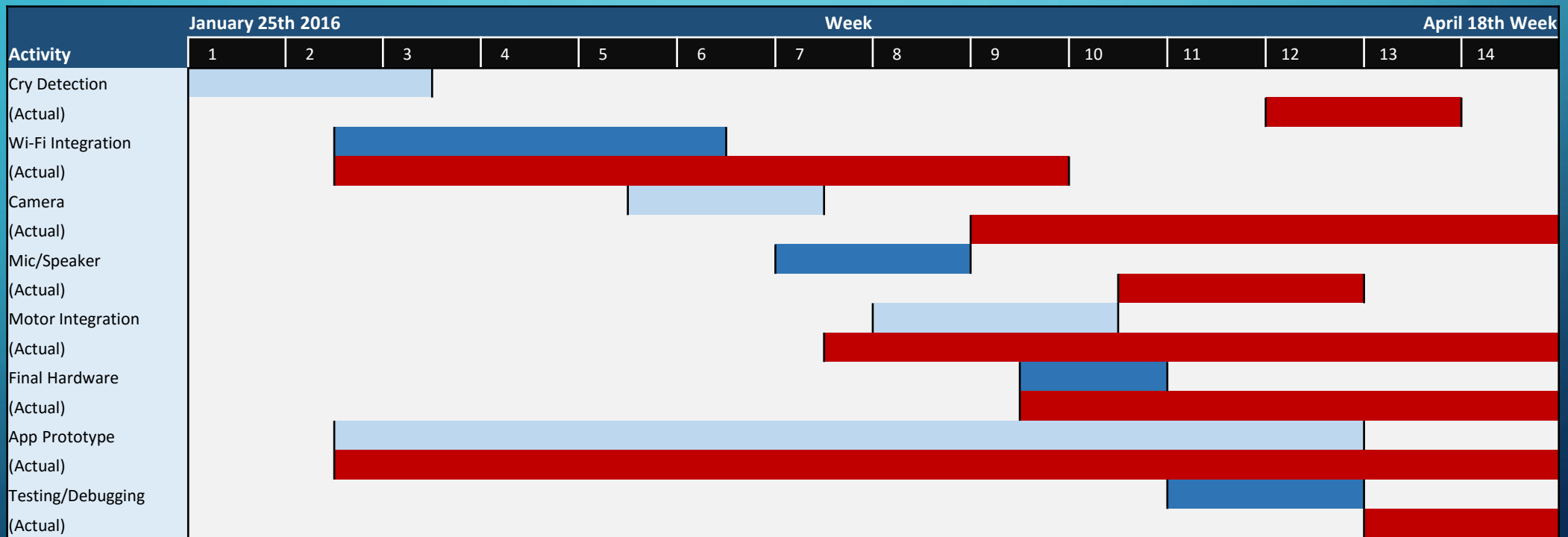- Connects to the Microcontroller through a Wi-Fi network

BLOCK DIAGRAM OF SMART BABY CRADLE SYSTEM

MATERIALS AND COST

Components	Estimated	Actual	Difference
Baby Cradle	$95	$25	$70
Stepper Motor (Old)	$105	$38	$67
Stepper Motor (New)	0	$55	$-55
Motor Driver	$25	$30	$-5
Power Adapter	$25	$25	$0
Microcontroller	$34	$68	$-34
Camera	$32	$43	$-11
Microphone	$19	$74	$55
Speaker	$6	$6	$0
Wifi Module	$76	$15	$61
Mobile Toy	$10	N/A	$10
Others (wires, belts, hardware)	$75	$31	$44
Total	$502	$410	$92

TIMELINE

Activity	January 25th 2016						Week						April 18th Week
	1	2	3	4	5	6	7	8	9	10	11	12	13	14

Cry Detection
(Actual)
Wi-Fi Integration
(Actual)
Camera
(Actual)
Mic/Speaker
(Actual)
Motor Integration
(Actual)
Final Hardware
(Actual)
App Prototype
(Actual)
Testing/Debugging
(Actual)

MARKET & COMPETITION

- The average parent is Around 29 years old

- Most People especially the younger generation have smartphones

Competition

- Fisher Price 4 in 1 Smart Cradle'N'Swing

  - $362.35 in Amazon (USD)

PRICE AND ESTIMATED SALES

- Cost of Prototype : $410

- Expected Price after Mass Production: $300

- 390, 000 estimated New Parents in Canada

- $9,700,000 Estimate Profit if 20% of New Parents purchased BabyRocks 'Smart Baby Cradle.

PROBLEMS WE FACED

- We initially used an Arduino Uno
  - It couldn't handle more than one Shield

- Limitations in Hardware
  - Couldn't implement multithreaded functions

- We initially ordered the wrong motor.

- The webcam we ordered needed decoding.

- We had Budgeting Issues due to the lack of available funding.

CONCLUSION

REFERENCES

- Statistics Canada "Births, estimates, by province and territory" http://www.statcan.gc.ca/tables-tableaux/sum-som/l01/cst01/demo04a-eng.htm

- "Robot Shop" http://www.robotshop.com/blog/en/how-to-make-a-robot-lesson-5-motor-controller-3695

- "What is Torque" https://www.physics.uoguelph.ca/tutorials/torque/Q.torque.intro.html

- "Getting Started" http://developer.android.com/training/index.html

QUESTIONS