Shoreline Oil Detection System

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Our Team

- James Kennedy, CEO
  - Project management and software
- Ahmed Saleh, COO
  - Market research
- Ned Tobin, CFO
  - Finances and prototype construction
- Farid Mabrouk, CTO
  - Electronic circuitry and design

Agenda

- Introduction
- Background
- Technical Features
- Future Development
- Production costs
- Project Financing
- Learning Experiences
- Conclusion
- Q&A

Introduction

Background
Features
Future
Financials
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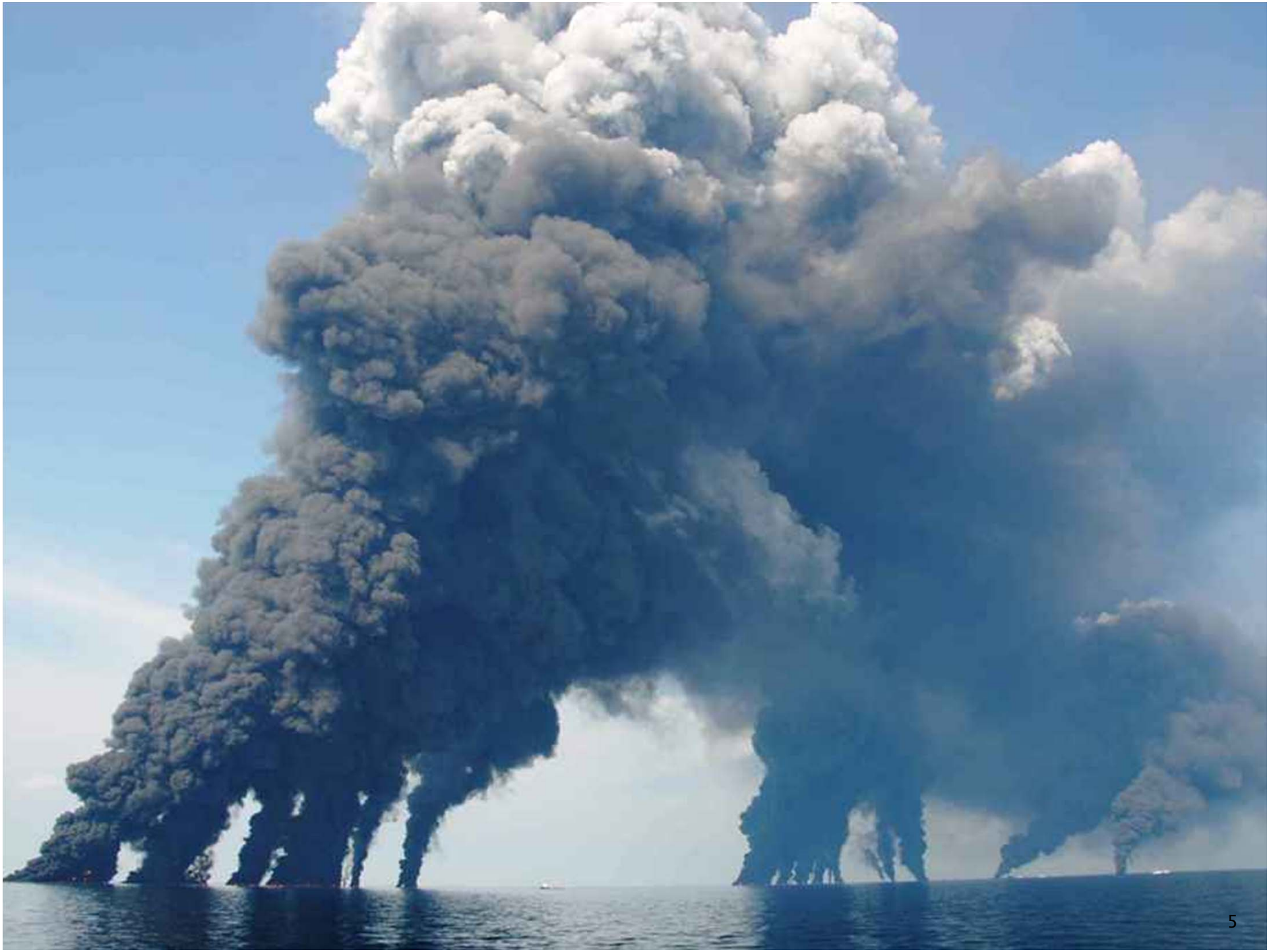
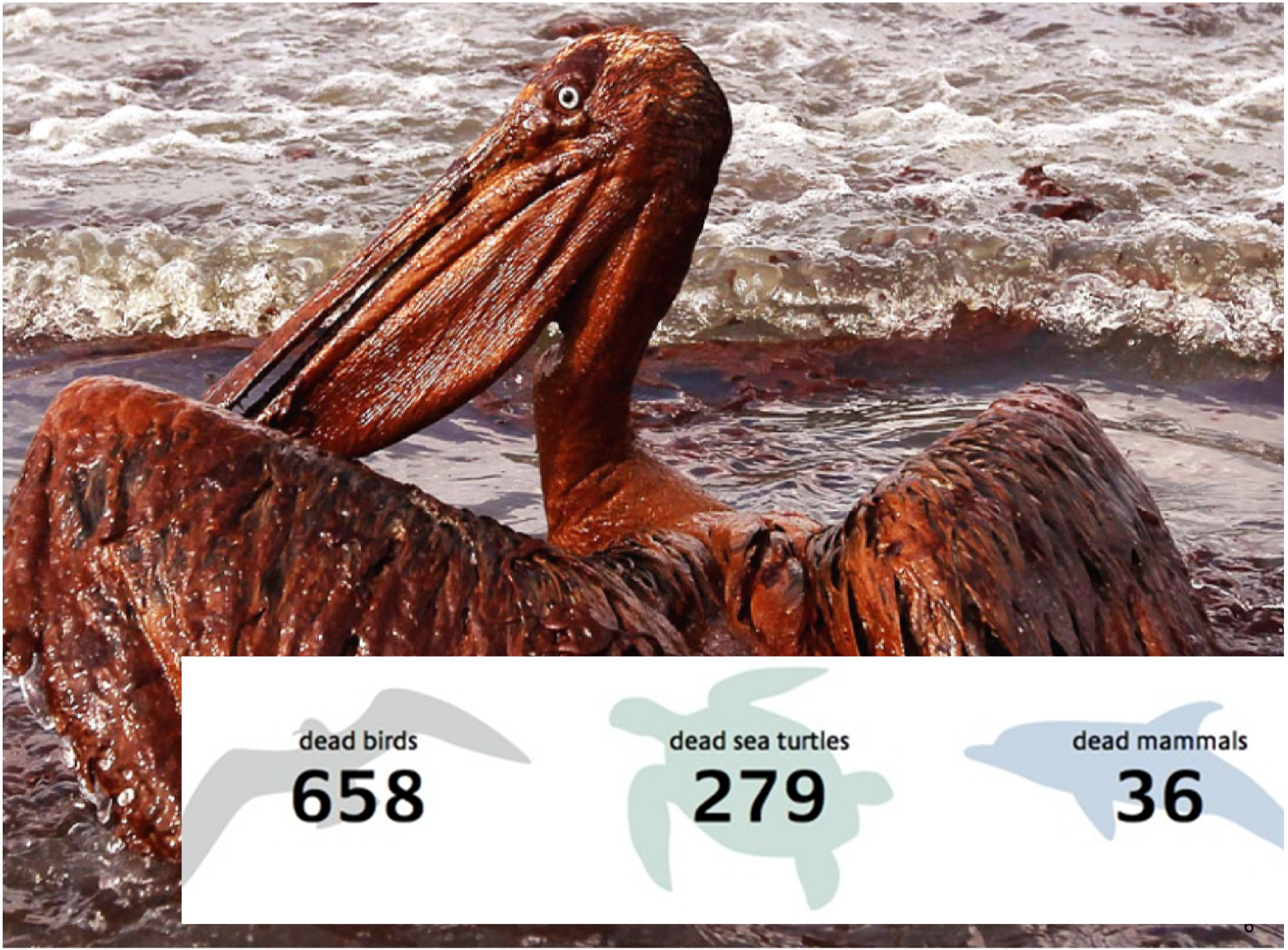
- Shoreline Oil Detection System
- Strategically placed along coastline
- Advanced warning to help protect
  - Coral reefs
  - Marshland
  - Shallow water creatures




dead birds
658
dead sea turtles
279
dead mammals
36

Previous Oil Spills

Background
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- Deep Water Horizon Oil Spill (2010)
  - 90 other rigs in the Gulf of Mexico
  - 1.7million barrels per day
  - 187 billion m^3 of gas per day
- Exxon Valdez Alaska Oil Spill (1989)
  - 750 thousand barrels of crude (120M Litres)
  - 28000 km^2 of ocean
  - Complications
    - Helicopter, plant, or boat

Current Solutions

Background
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- Optical Detection – Slick Sleuth

Current Solutions

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- Satellite Images

International Space Station

Current Solutions

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- Photography/sighting
  - Requires aircraft
  - Severly limited by
    - Weather
    - Daylight

Our Goals

- Self-sufficient
  - Rechargable, battery-powered
- Portable
  - Easy to transport and install
- Wireless
  - Does not need to be checked
  - Operator can be anywhere
- Accurate
  - Real-time response

Detection Theory

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- Sensor design based on Conductivity
  - Two electrodes placed on water's surface
- Current between the two electrodes changes
  - Dependant on what medium they are conducting through
- Sensor outputs to microcontroller
  - Analyzes readings and reacts as necessary

Digital Electronics

- Arduino Mega 2560 microcontroller
- SM5100B Cellular Shield
  - Read from oil sensor
  - Control battery recharging
  - Send operator alerts using SMS message

Construction

- 45cm^2 PVC tubing (plumbing)
- 22x11x18cm waterproof case
- Rubber coated metal grill

Deployment

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- Coast lines, Coral Reefs, Oil Rigs
  - Sensitive areas
- Installation team
  - Setup, secure, and test
- Operations team
  - Receive service alerts from device

Future Development

- Satellite transmission
  - Doesn't require SMS bad signals
  - Accurate position tracking
- Electrode materials
  - Floating
  - Non-corrosive
- Maintenance alerts
  - Alert maintenance team of faults
  - More test points

Timeline

- 3 ½-month development cycle
  - Research, prototype, and test
- Regular deliverables
  - Full group check-in on weekly intervals
  - Progress reports to instructors
- Collaborative process
  - Entire team involved in each aspect

Competitive Advantage

- Small, lightweight
  - Easy to place anywhere
  - No installation equipment
- Alert notification
  - SMS Alert
- Self contained system
  - Very low deployment cost
  - No special antennas or base units

Financing

- Engineering Student Society Fund
  - $350.00
- ENSC 440 fund
  - Small parts

SFU

Costs & Budget

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Processing	$215.83
Frame/Construction	$65.15
Elec Components	$76.98
Total	$357.96

Funding	$350.00
Self-financed	$7.96
Estimated Budget	$440.00

Revenue Breakdown

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Build Cost/Unit	$357.96
Sales Charge/Unit	$5000.00
Profit/Unit	$4642.04
Maintenance Charge/Month	$500.00
Maintenance Charge/Year	$6000.00

Distribution & Sales

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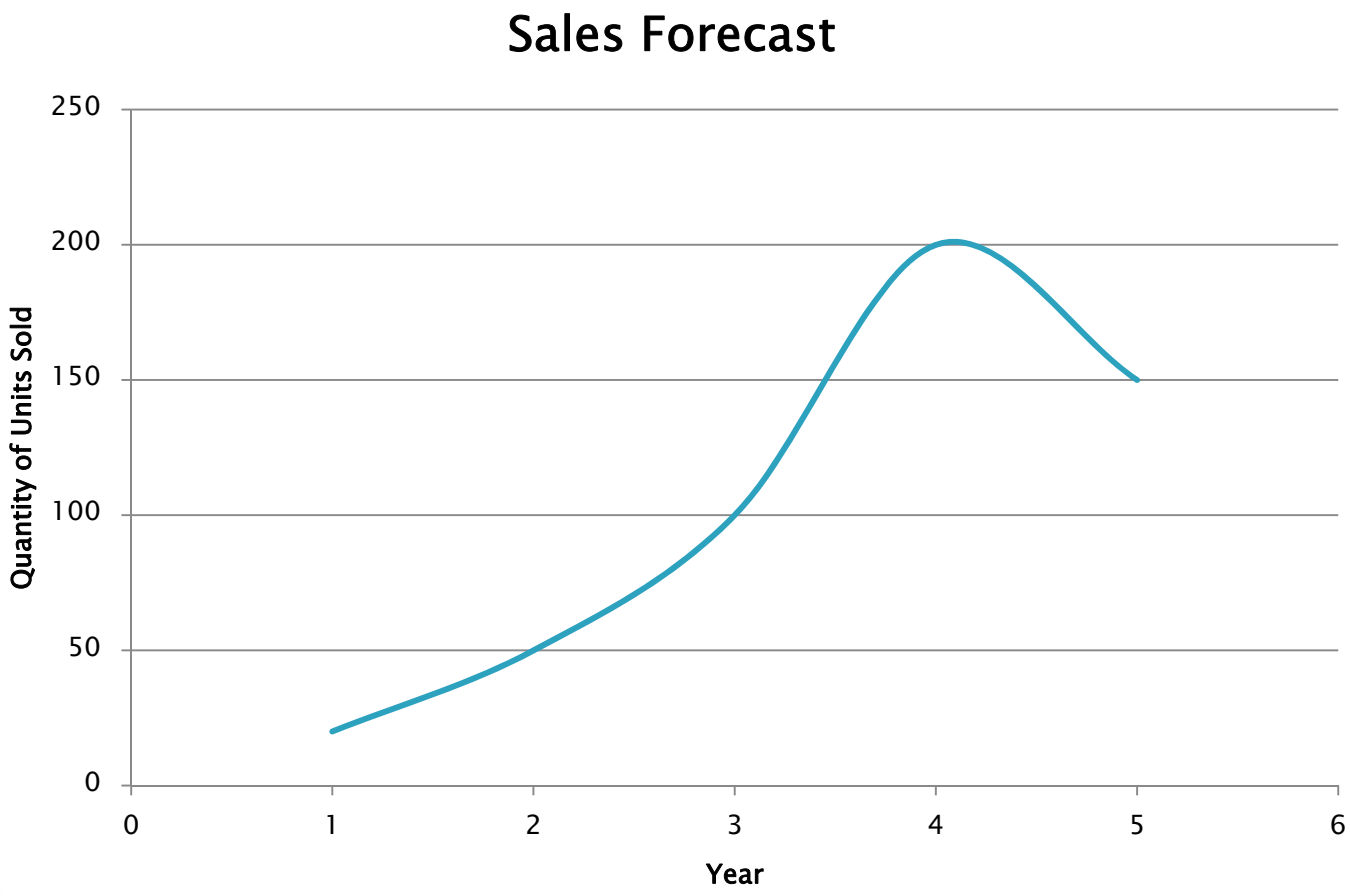

Revenue Forecast

- Background
- Features
- Future
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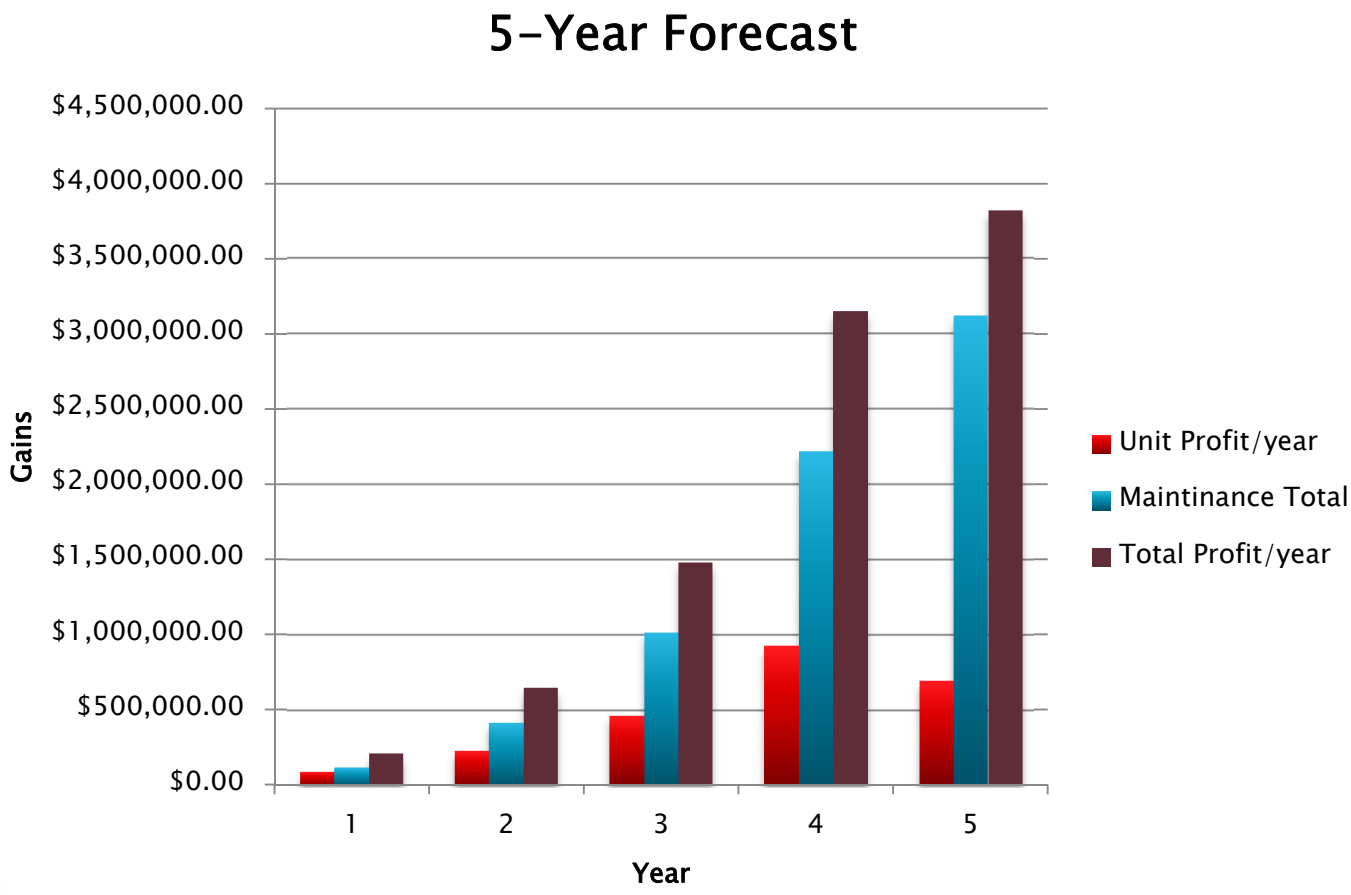

Complications/Advice

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- Improper data specifications
  - Miscalculated Power requirements
  - Triple check data specs
- Equipment failure
  - Faulty SMS board, microcontroller
  - Test components ASAP
  - Return dates expire
- Returning parts
  - Lee's Electronics
  - Home Depot

Advice on Research

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- Research and documentation
  - Keeping it organized!
- Competitors quotes (secrets)
  - Nobody wants to tell you price
- Market research & Surveys
  - Nobody has time
- Don’t Panic!

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- Professor John Bird
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Q/A?

Information Sources

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Low Level System Detail

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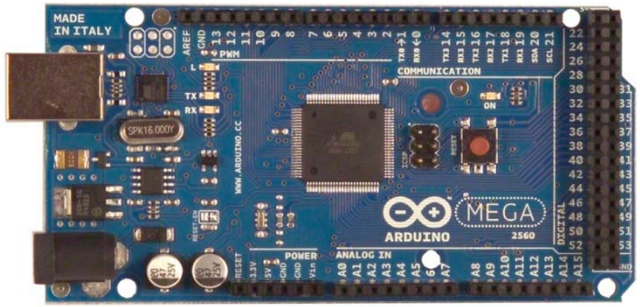
- Arduino Mega 2560 microcontroller



- SM5100B Cellular Shield