IPRO 355

Enhanced Vision System for Construction Safety

Agenda

- Problem Statement and Objectives
- Methodology and Organization
- Product
- Business Concept and Market Research
- Target Markets and Competitor Analysis
- Value Chain and Monthly Sales

Problem Statement

- Case studies:
  - Stephanie Hammacott, UK
  - Ghislenghein, Belgium (2004)
  - Chicago Flood (1992)
- 5,000 construction worksite deaths occur annually
- $250 million lost in accidents annually

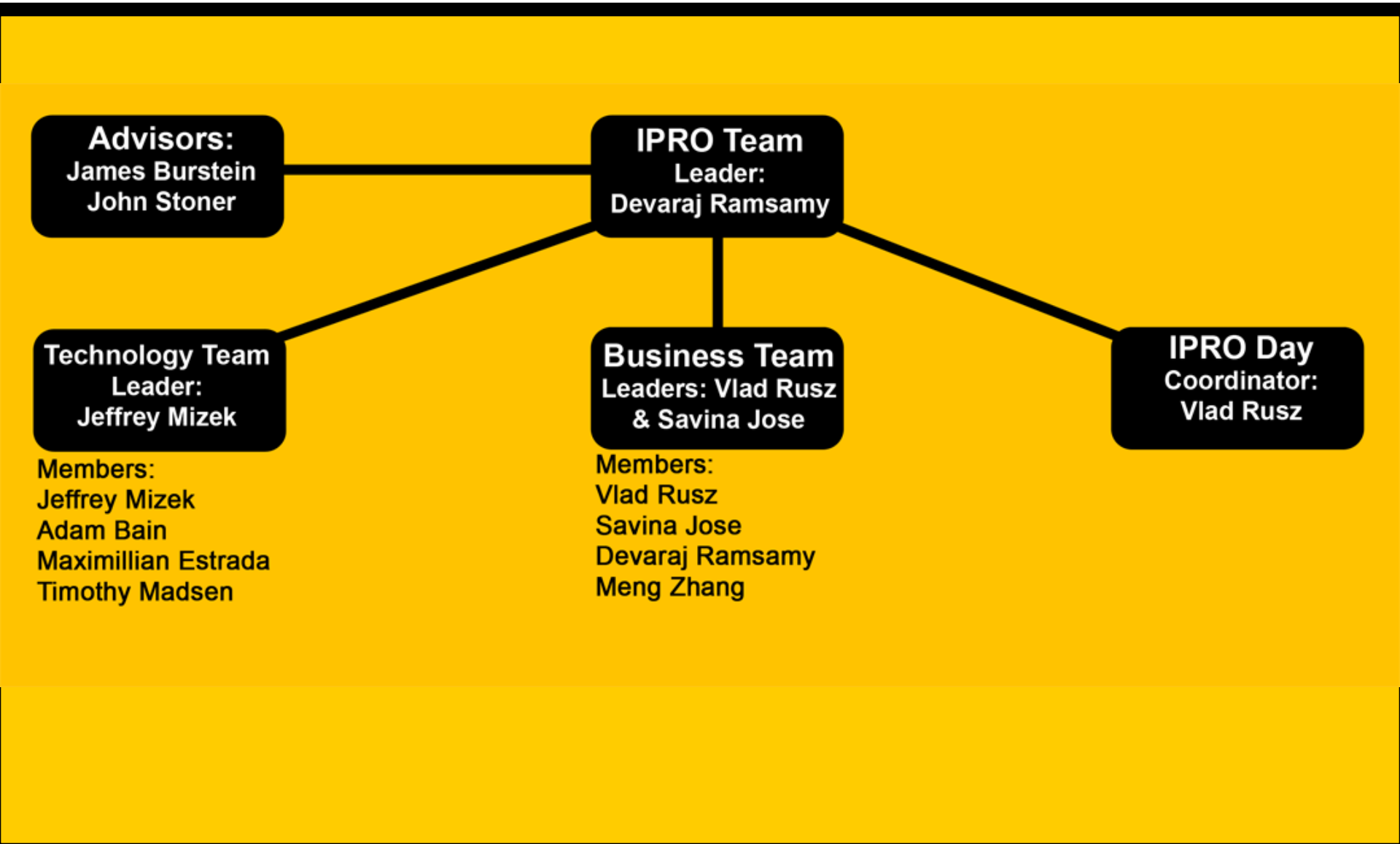
Objectives

- Dedication to saving lives and preventing accidents
- Design an enhanced vision system
- Provide reliable, timely, and accurate information to construction workers

Methodology

- Communication / Project Management
  - Meetings
  - Reports and Presentations
- Business
  - Market Research
  - Business Development
- Technology
  - Proof-of-concept Prototype

Organizational Chart

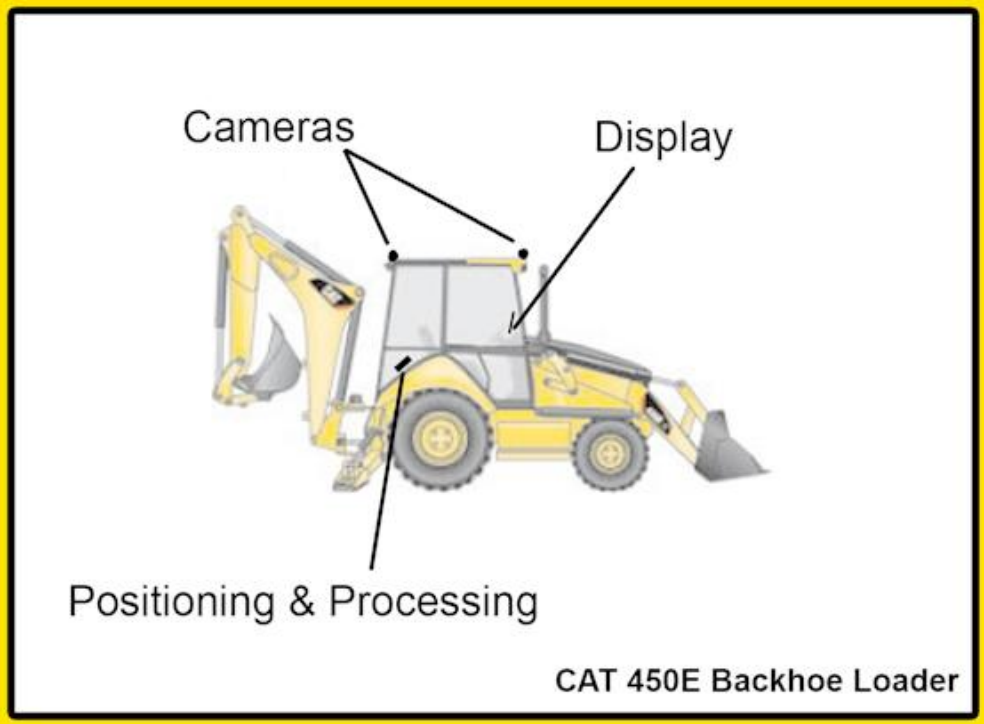


Product Overview

- Information overlays
  - Improve visibility
- Simple operation
- Rugged
- Mount to existing vehicles

Product Features

- Two positioning systems
- Rugged camera
- Durable display
- On-board computer
- Advanced models:
  - Additional cameras
  - Tool sensor



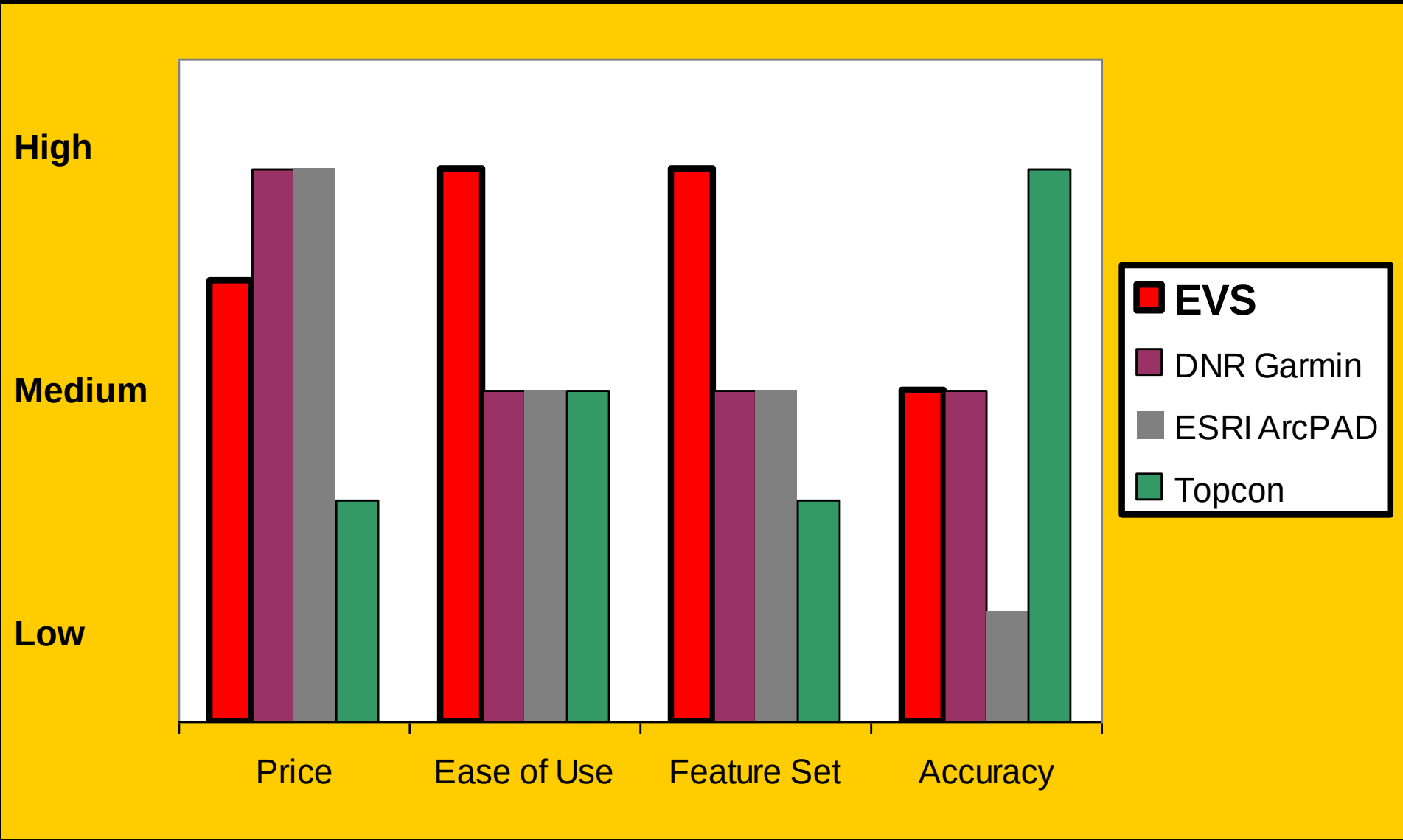
Business Concept

- Value Proposition
  - Save Lives
  - Reduce Accidents
  - Provide Value
- Business Model
  - B2B
  - Outsource
  - Technology Development

Market Research & Conclusions

- Primary
  - CAE Professors
  - Industry Specialists
- Secondary
  - Market Data
  - Annual Reports

Competitors Strengths & Weaknesses



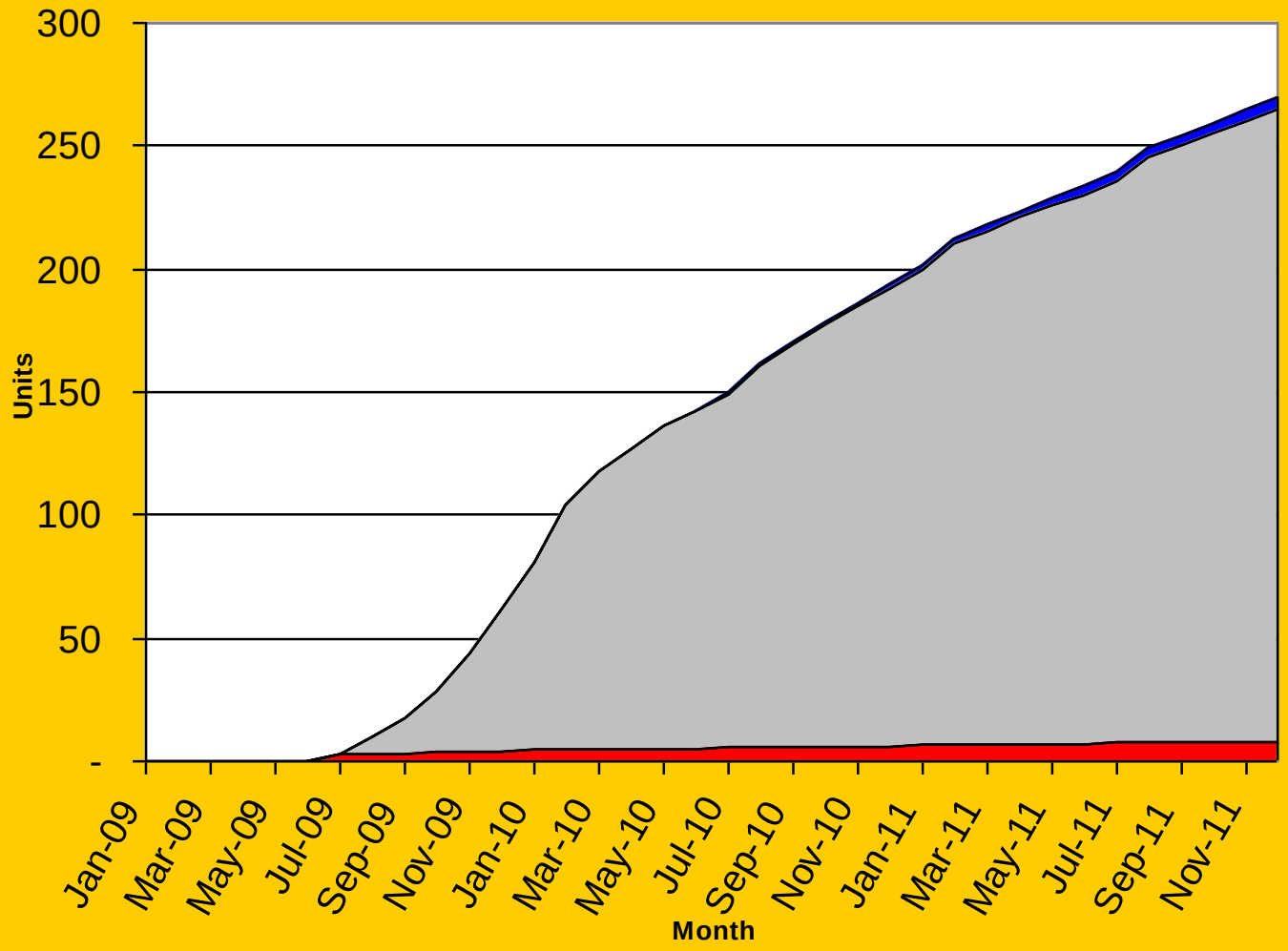
Business Risks

- Start-up Risks
- Intellectual Property
- Quality
- Feasibility
- Entry Barriers

Target Markets & Sales Projections

- Target Market
  - Geographic location
  - Number of machines
- Sales Projections
  - New market every 6 months
  - New: 4 customers per month
  - Mature: 1 customer per month

Monthly Sales



Unit Price

Year 1: $5,000

Year 2: $8,000

Year 3: $10,000

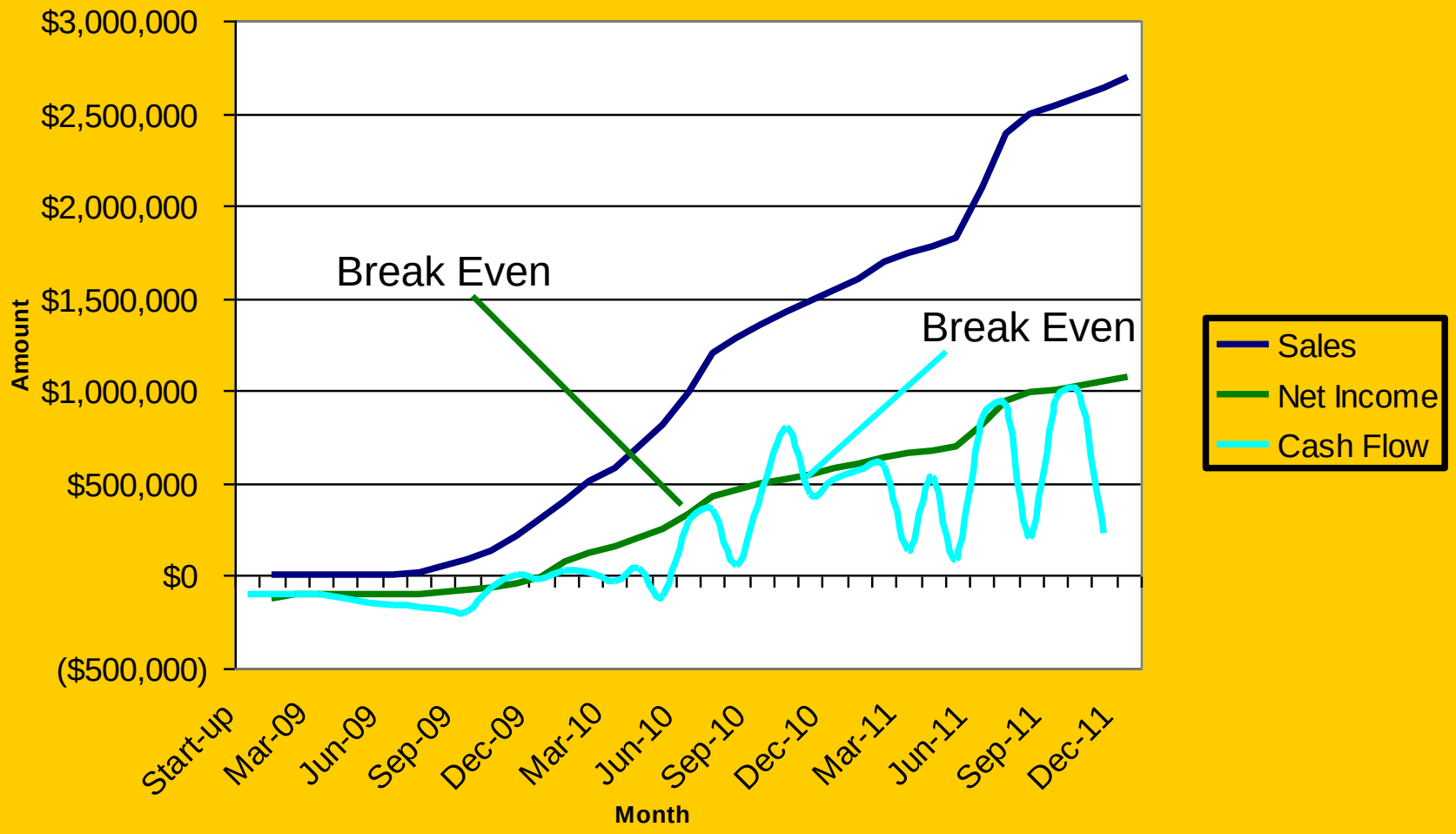
Unit Cost

DM: 44% of Price

DL: $180

QA: $120

Financial Projections



Startup needs: $1,800,000

Questions

Law and Regulations

Canon: We will comply with all intellectual property and regulatory laws to the best of our abilities.

Pressure: To make a product that does not infringe on other intellectual property.

Risk: Not doing enough research into patents that exist on augmented reality and infringing on other patents.

Risk: The patent research being performed too narrowly and other non augmented reality patents being infringed.

Measure: Being threatened with law suites due to patent infringement.

Pressure: To complete the work and building the prototype on time.

Risk: Exposing the project to unnecessary liabilities due to the legal and regulatory research being insufficient due to time restrictions.

Contracts

Canon: We will abide by all the terms of the contracts and all non disclosure agreement that apply to our project.

Pressure: To use the prototype hardware for personal or non project related uses due to the hardware's other functions, such as using the GPS device for car navigation.

Risk: Violating terms of contracts with sponsors which can lead to withdraw of support.

Measure: Sponsors withdrawing their support for the project.

Pressure: Needing assistance from third parties for equipment operation and prototype building.

Risk: Violating non disclosure agreements.

Risk: Releasing trade secrets to outside parties.

Measure: Trade secrets being stolen and patented

Professional Codes

Canon: We will abide by the construction industry professional codes as pertaining to safety equipment.

Pressure: Create the most affordable prototype possible.

Risk: The product not providing any real value.

Risk: Not considering quality and safety issues in lieu of price.

Risk: Prototype not actually providing valuable information to the user and not providing any extra safety.

Pressure: Create the highest quality prototype.

Risk: Few consumers will be able to take advantage of its life saving ability due to its high price.

Measure: The change or lack thereof the number of recorded fatalities and accidents in the construction industry.

Business and Industry Standards

Canon: Performing to the highest ethical standards of the construction and safety industry, keeping in mind that our product saves lives.

Pressure: To produce a prototype as quickly as possible.

Risk: Disregarding the new safety issues that our product will create.

Risk: The production of a dangerous prototype

Risk: The product not being thoroughly tested in the field and thus not being guaranteed to be reliable.

Measure: Obtaining a safety certification from such organizations as OSHA.

Pressure: To produce a product that is robust.

Risk: The inability to efficiently test the product due to its many functions.

Community

Canon: The team will thoroughly test and ensure the product provides the best safety and most value to the communities in which our product is used.

Pressure: Get product to market as soon as possible.

Risk: Product is not thoroughly tested and does not provide the intended value.

Risk: Putting the community at serious risk due to malfunction of the product.

Risk: Business fundamentals of the product are not properly researched to provide the most value to the community.

Measure: Legal action taken against the product's manufacturers by stakeholders.

Personal Relations

Canon: The team will respect each other's opinions and completed work.

Pressure: To have a team and sub teams with a significant amount of autonomy.

Risk: Sub teams not understanding each other's work.

Risk: Project being delayed due to lengthened discussions and team member conflict.

Pressure: To complete a large, varied amount of work in a short amount of time, such as weekly deliverables

Risk: Team members taking credit for other work.

Measure: Peer review at end of project

Moral Values

Canon: No team member will be required to do anything that violates their own personal, religious, moral, or ethical beliefs.

Pressure: The need to work outside of class.

Risk: Working on days that some consider religious holidays.

Pressure: To complete all assigned work on time.

Risk: Forcing a member to violate personal morals or values to meet deadlines.

Measure: Member brings up situation to team publicly or privately to the proper hierarchical person, possibly the team leader.

Value Chain

Firm Infrastructure: Entrepreneurial management team; Focus: building quality into product at every stage; Culture: we save lives

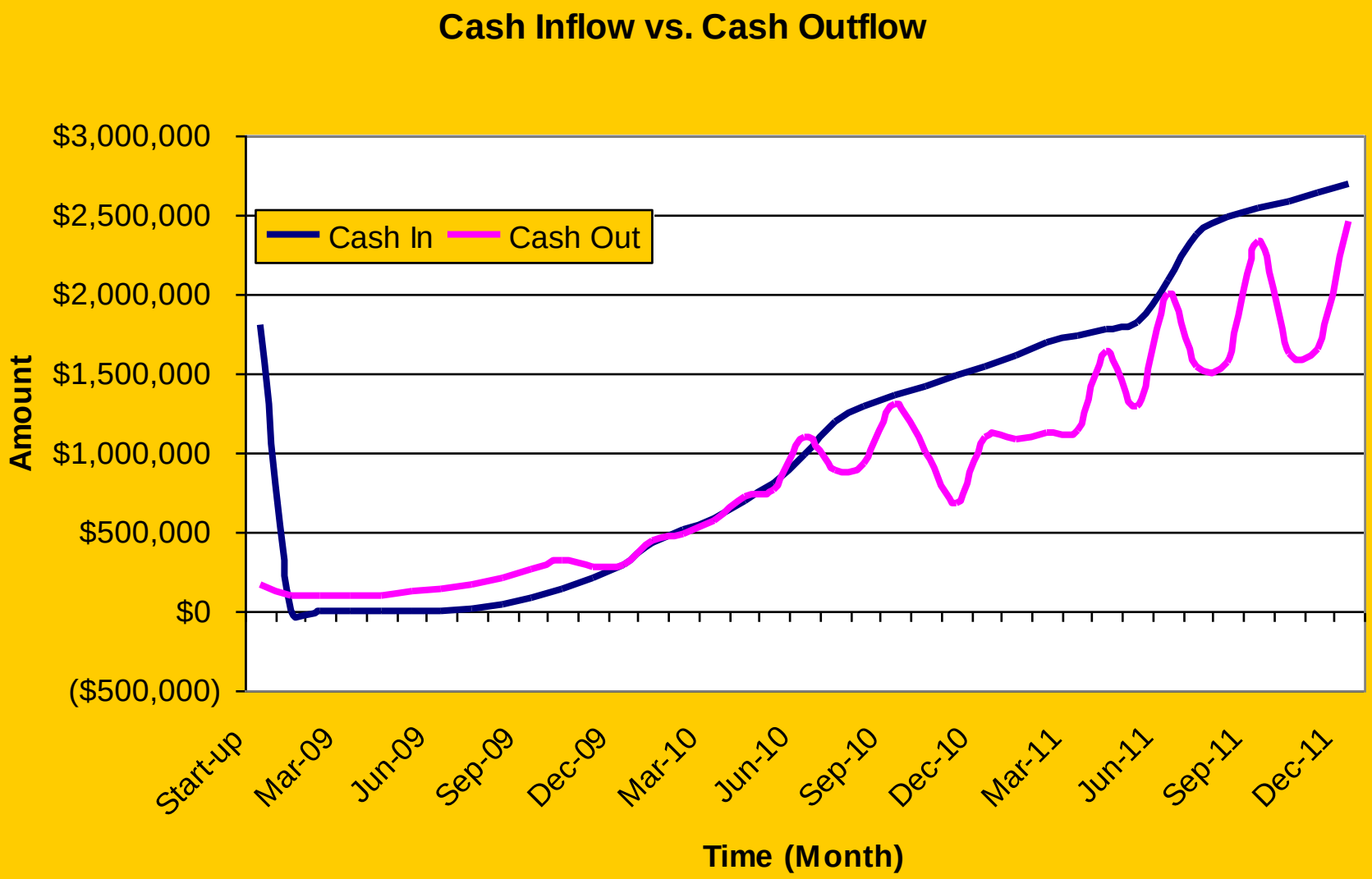
Human Resource: small number of engineers working on development; persons understand implications of their work; high productivity, loyalty, and compensation

Technology Development: continual development of product design and software to increase effectiveness of product and provide more value to the customer

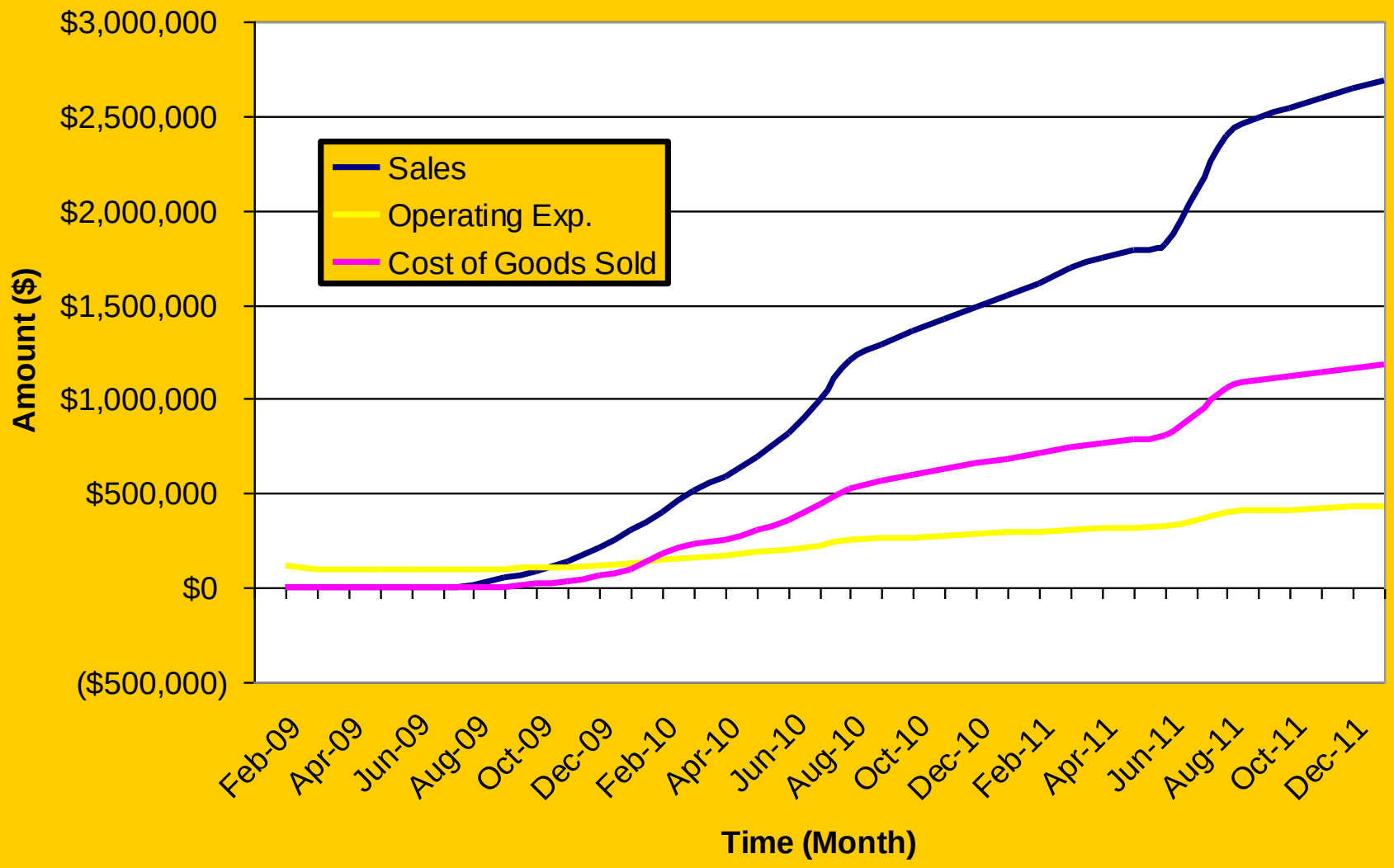
Procurement: Production outsourcing company: good relationship; ensure quality of product; timeliness of delivery.
Installation service company: good relationship; ensure proper and prompt installation and service.

Inbound Logistics	*Operations*	*Outbound*	*Marketing*	*Customer Service*
- Product (Production is outsourced) - Installation Service (outsourced)	- Quality Assurace	- EVS units - Units sold by company sales force - Installation training services	- Trade Shows - Demonstrations - Free Trials - Construction Magazines	- Installation provider diagnoses unit - Replace broken units

Cash


Cash Inflow vs. Cash Outflow
$3,000,000
$2,500,000
$2,000,000
$1,500,000
$1,000,000
$500,000
$0
($500,000)
Amount
Cash In
Cash Out
Start-up
Mar-09
Jun-09
Sep-09
Dec-09
Mar-10
Jun-10
Sep-10
Dec-10
Mar-11
Jun-11
Sep-11
Dec-11
Time (Month)

Sales vs. Expenses



Enhanced Vision System
Year-End
Income Statement (Projected)

	2009	2010	2011
Net Sales (less returns & allowances)	810,000	12,307,000	26,093,000
Cost of Goods Sold	356,400	5,415,080	11,480,920
Gross Income	**$ 453,600**	**$ 6,891,920**	**$ 14,612,080**
Depreciation & Amortization	10,952	10,952	10,952
Insurance	9,100	123,070	260,930
Marketing & Promotion	90,720	1,378,384	2,922,416
Office Supplies	3,400	2,400	2,400
Payroll Expenses			
Salaries & Wages	1,010,000	930,000	930,000
Benefits	202,000	186,000	186,000
Professional Fees	20,000	-	-
Rent	36,000	36,000	36,000
Repairs & Maintenance	1,010	24,614	52,186
Telephone	600	1,200	1,200
Utilities	3,400	2,400	2,400
Wearhousing	8,000	12,000	12,000
Total Operating Expenses	**$ 1,395,182**	**$ 2,707,020**	**$ 4,416,484**
Operating Income	**$ (941,582)**	**$ 4,184,900**	**$ 10,195,596**
Income Before Taxes	**$ (941,582)**	**$ 4,184,900**	**$ 10,195,596**
Income Taxes	-	1,046,225	2,548,899
Net Income	**$ (941,582)**	**$ 3,138,675**	**$ 7,646,697**

Enhanced Vision System
Year-End
Balance Sheet (Projected)

	2009	2010	2011
Assets			
Current Assets			
Cash & Equivalents	213,188	2,515,544	9,101,835
Accounts Receivable	39,650	46,320	80,700
Inventory	566,532	1,407,133	2,444,111
Total Current Assets	**$ 819,370**	**$ 3,968,997**	**$ 11,626,646**
Fixed Assets			
Property, Plant & Equipment	50,000	50,000	50,000
Less: Accumulated Depreciatio	(10,952)	(21,905)	(32,857)
Total Non-Current Assets	**$ 39,048**	**$ 28,095**	**$ 17,143**
Total Assets	**$ 858,418**	**$ 3,997,092**	**$ 11,643,789**
Liabilities			
Total Liabilities	**$ -**	**$ -**	**$ -**
Equity			
Equity Investments	1,800,000	1,800,000	1,800,000
Retained Earnings	(941,582)	2,197,092	9,843,789
Total Equity	**$ 858,418**	**$ 3,997,092**	**$ 11,643,789**
Total Liabilities and Equity	**$ 858,418**	**$ 3,997,092**	**$ 11,643,789**