

IPRO 355

Enhanced Vision System for Construction Safety



Agenda

- Problem Statement
- Project Goals
- Methodology and Organization
- Past / Current Progress
- Major Obstacle
- Anticipated Challenges
- Business
- Summary
- Questions

Problem Statement: Case Study

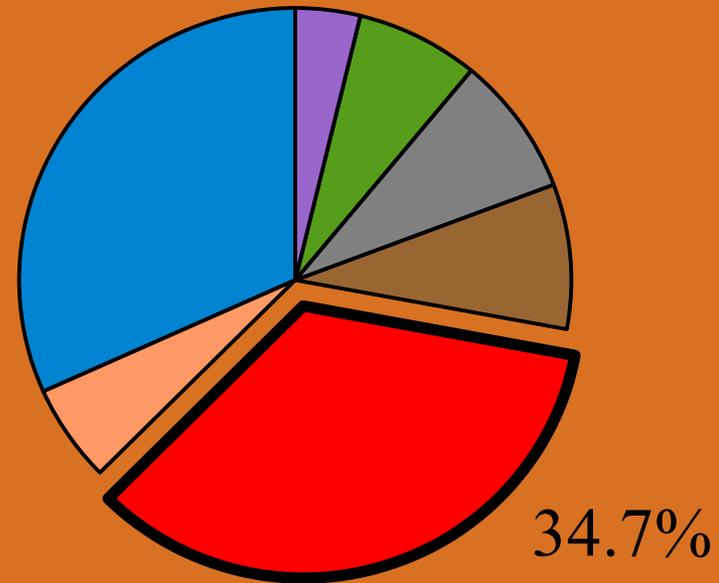


Problem Statement: Case Study



Problem Statement

- Buried utilities pose threat to excavation
- Damaging underground utilities causes hundreds of deaths and injuries and millions in losses
- Current utility marking methods are flawed



Percentage of pipeline accidents caused by excavation damage

Source: PHMSA, 2008

Overall Project Goals

- Save lives and prevent construction accidents
- Provide operators with display location of utilities to operators
- Show better view of potential hazards
- Warn operators when within digging range of utility

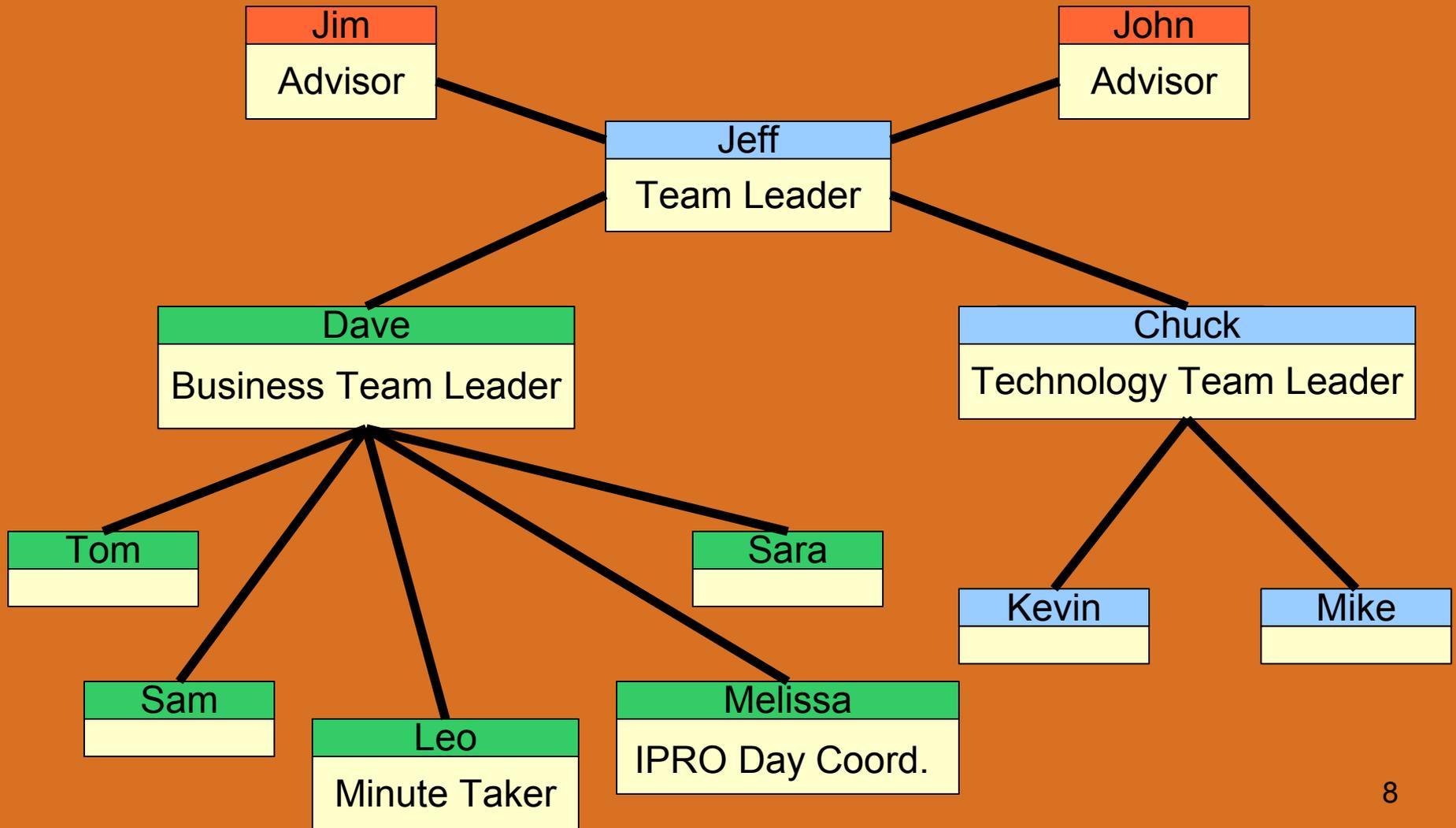


Semester Goals

- Research construction industry and market
- Create business opportunity assessment
- Design software application
- Form relationship with Trimble



Team Organization



Previous Semester's Work



- Previous team outlined overall goals
- Created business plan
- Designed device
- Began work on prototype

Progress Towards Goals



- Interviewed a safety administrator, operators, lawyers, and a mechanic
- Examined other companies in the market
- Obtained Software Developer's Kit (SDK)
- Emailed Trimble

Ethical Considerations

- Intellectual Property
 - Discovered under-utilized patent
 - Respect IP rights of others
- Public Good
 - Technologies may improve safety
 - Patent may inhibit public benefit
- Solution
 - Due diligence

Problem Solving

- Patent research
- Law student
- Team considered other means:
 - Good will statute
 - Forming relationship with patent holder
 - Changing our method
 - 3rd party company
- IP counsel

Conflict Resolution

- Robert Diehl of Seyfarth Shaw, LLP
- Determined non-infringement
- Performed patentability review
- Unable to patent, but seem to have freedom to operate
- May perform full review in coming semesters

Market Research

- Chicago-based construction companies
 - e.g. Walsh, McHugh, Power
- Researched current safety solutions
- Interviews conducted
- Identify key expansionary targets
 - Midwest upon launch

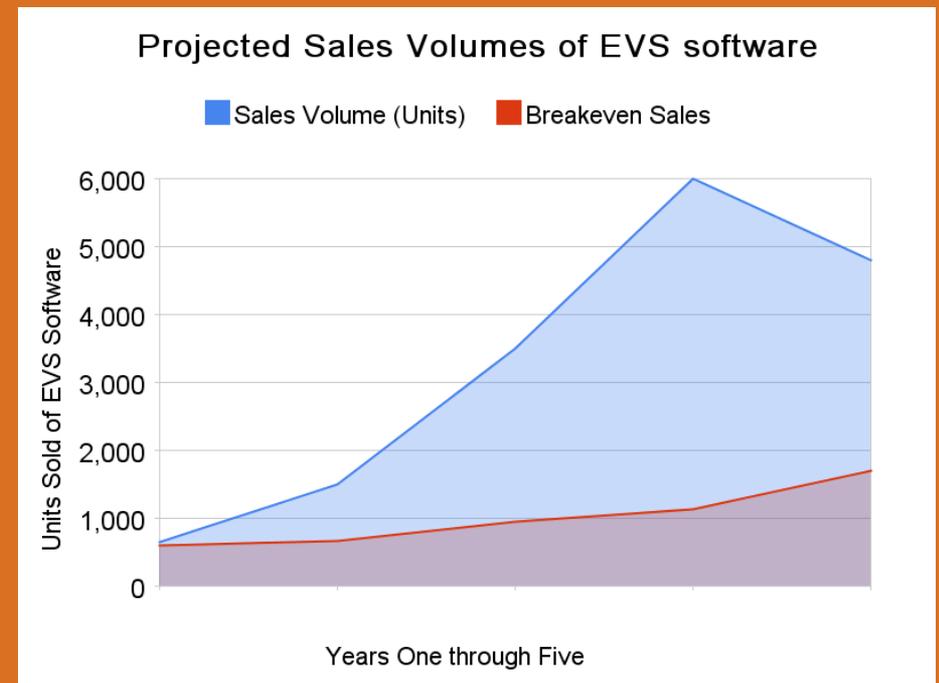
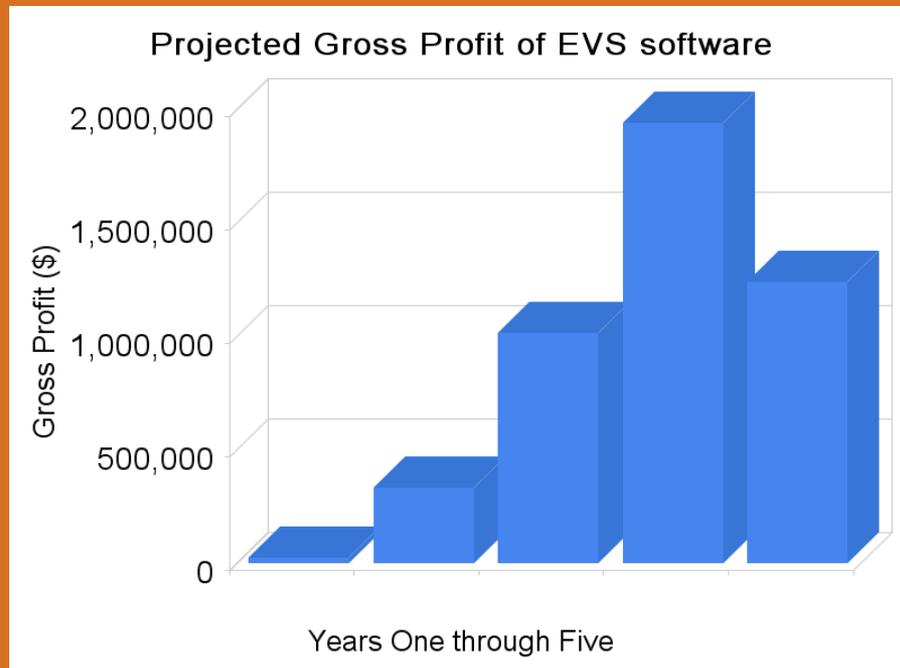
Competitors

- Guardian Pro Star
 - Provide integrated solution
 - Low market penetration
- uaView / uaField
 - Trimble software offering
 - Not intended for operator use
- Legacy utility map systems
 - Incumbent technology
 - Static, lacks features

Business Model

- Develop software applications
- Business to Business sales
 - Construction companies and contractors
 - Online downloads
 - Direct to customer outside sales
- Virtual organization composed of:
 - Owners
 - Employees
 - Independent contractors

Sales / Profit Forecasts



Income Statement

- \$200,000 startup capital needed
- Profitable after first year – PV = \$3,000,000
- Initial expenses and firm growth
 - New versions of EVS
- Potential for new R&D after two years

Year	One	Two	Three	Four	Five
Sales Volume (Units)	650	1,500	3,500	6,000	4,800
Breakeven Sales (Units)	594	798	1,151	1,548	2,004
Revenue (\$) [\$399]	259,350	598,500	1,396,500	2,394,000	1,915,200
Expenses (\$)	237,080	318,320	459,143	617,505	799,414
Net Profit (\$)	15,589	196,126	656,150	1,243,546	758,563

Assumptions and Risks

Assumptions

- 20% market penetration
- Reasonable stable economy
- Effective project management
- Freedom to operate

Risks

- Resistance to change
- Standard start-up risks
- Technical Obsolescence
- Competitive reaction
- IP concerns

Path Ahead

- Perform secondary target market research
- Finalize business plan
- Develop software application beta version
- Pursue business relationship with Trimble
 - Identify substitute hardware providers

Summary

- Construction poses threat to utilities
- Current utility marking methods flawed
- EVS software may help prevent accidents
- Business opportunity

Credits and Thanks

- Seyfarth Shaw, LLP
- Robert Diehl, esq.
- Advisors: Jim Burstein, John Stoner
- Walsh Construction
- Martin Turek
- Alex Pappas- Kent Law student
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Questions

