



Robotic Arm Platform

Week 1 & 2 Deliverables

ERIN BRENNAN

ALEC FENICHEL

ERIC HOM

SHAUN ORR

JOSH LIEBERMAN

Problem Statement

Suez has a need for a stable platform system capable of supporting a robotic cleaning arm inside water tanks. Requirements for the platform include stable construction to support the movement of the arm, versatility to accommodate multiple tank designs, remote operation of the platform system and arm, and visual feedback for operator to confirm arm positioning. The project team will provide scaled prototype of solution with explicit bill of materials and method of construction.

Team Skills



Erin Brennan

Project Manager
Fabrication
Website

Project Management
CNC Machining
Mechanical Failure Analysis
Production Line Design
Industrial Manufacturing
Experience



Josh Lieberman

Mechanical Design
Material Selection

Mechanical Design
Industrial Design
Mechanical Failure Analysis
Material Sourcing
Business Background
Patent Experience



Shaun Orr

Mechanical Design
Material Selection
Research

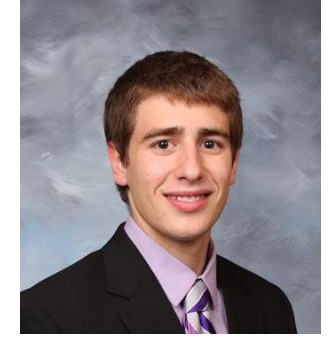
Mechanical Design
Rapid Prototyping
CAD Modeling
Project Management
Production Line Design
Microcontrollers



Eric Hom

Fabrication
Research

New Product
Development
Prototype Testing
R&D Engineering
CAD Modeling

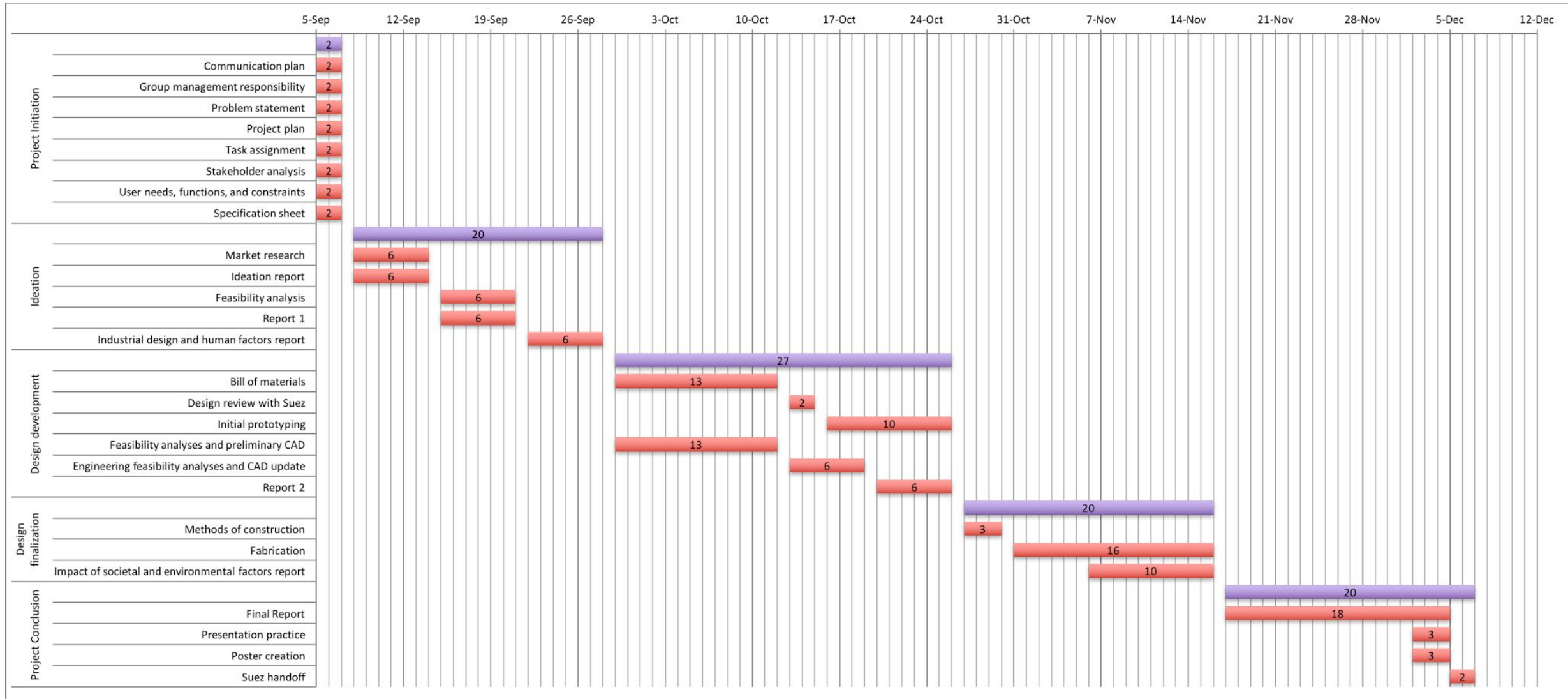


Alec Fenichel

Controls
Fabrication
Website

Rapid Prototyping
Programming
Electrical
Robotics
Microcontrollers

Project Plan



Task Assignments

ITEM	DESCRIPTION	DUE	RESPONSIBILITY
PROJECT INITIATION			
Communication plan	Determine methods of communication for sponsor contact/internal contact, meeting times, etc.	7-Sep	Erin
Group Management responsibilities	Determine broad contributions to team for each member ie, group leader, controls, fabrication, mechanical design, etc.	7-Sep	Erin
Problem Statement	Define the scope and expected content of the project. It addresses novelty, customer needs, specifications, constraints, evaluation criteria, market, goals, and any other specific relevant issue of the project.	7-Sep	Hom
Project Plan	Each team submits a work plan for the completion of the project. Identify individual members responsible for activities related to group management, design partition, and deliverables. Include a timeline with critical dates. A Gantt chart is a useful model.	7-Sep	Alec
Task Assignment	Assign detailed responsibilities for each member as stated in the Project Plan. Each team member details the specific tasks in supporting the project and team. Each person must understand their own responsibilities and the responsibilities of the other team members.	7-Sep	Shaun
Stakeholder Analysis	Identify stakeholders and submit a stakeholder matrix and influence diagram for the project.	7-Sep	Josh
User needs, functions, and constraints	Identify the user needs and functions that the design has to fulfil, and applicable constraints.	7-Sep	Erin
Specification sheet	Identify engineering design specifications following SUEZ meeting. Consult lecture and ME 2110 material for a specification checklist (e.g., include quality requirements (define allowable tolerance levels), mechanical properties, material requirements, etc. Be as quantitative as possible when defining amounts, ranges, limits, tolerances, units, etc.	7-Sep	All
IDEATION			
Market Research	Begin research into prior art, relevant patents, similar concepts	19-Jul	Josh/Erin

Week 2 Deliverables

ERIN BRENNAN

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ERIC HOM

SHAUN ORR

JOSH LIEBERMAN

Stakeholder Analysis

Stakeholder	Interests	Impact/Effect	Importance	Influence
Suez WAS	Quicker, more cost effective tank cleaning using robotic arm	protect workers while using a more effective method of cleaning	High	High - design must meet company's constraints
Tank Cleaners	a solution that is safer, more ergonomic and faster	High impact on these workers daily jobs	High	High - solution must be able to work for them
Municipalities	quicker cleaning times leads to a faster turn around to an operational tank	Get tanks cleaned and operational ASAP	Medium	Low - this project has direct influence in design from the municipalities
Municipality Citizens	Want clean water tanks for potable water in reasonable time	Dirty tanks can lead to health problems	High	Low - this project has direct influence in design from the citizens
Robotic Arm Manufacturer	Stable platform for the arm would allow them to sell more arms to customers	Arm works but cannot be used well due to instability of platform	Medium	Medium - Arm has to fit design of base and input from the manufacturer could help improve design

User Needs

User Needs	Functions	Constraints
Platform to support Suez robotic arm	Platform must fit inside storage tank	Minimum and maximum dimensions of the steel water storage tanks
	Platform must remain stable while robot arm moves	Minimum and maximum dimensions of the robotic arm
	Platform moves both vertically and horizontally	Robust enough to support weight of robot arm
	Manually operated by an individual outside of the storage tank	Human factors with user controls
	Provide visual feedback to the operator	Camera location for maximum visual feedback without impacting function of arm
	User interface for operator to employ all tools in the arm's scope	Withstand wear from sandblasting
		Portable/easily moved or reassembled
		Safety constraints

Specification Sheet