FAMU-FSU College of Engineering

Portion Perfect
Design Review 4

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Cody Hayward, Jared Sizemore

Team Introduction

Alejandro Bendeck
Design Engineer

Adrian Canepa
Computational Engineer

Cody Hayward
Systems Engineer

Jared Sizemore
Manufacturing Engineer

FAMU-FSU College of Engineering

Sponsor and Advisors

Sponsor
Dean Suvranu De

Engineering Advisor
Dr. Shayne McConomy

Advisor & Point of Contact
Mark Orendorf

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Fall Recap

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Objective

The objective of this project is to optimize the distribution process of dried goods for Beth-El Mission.

The current distribution process at Beth-El Mission

Mark in storage center

Fall Recap | Key Goals & Assumptions

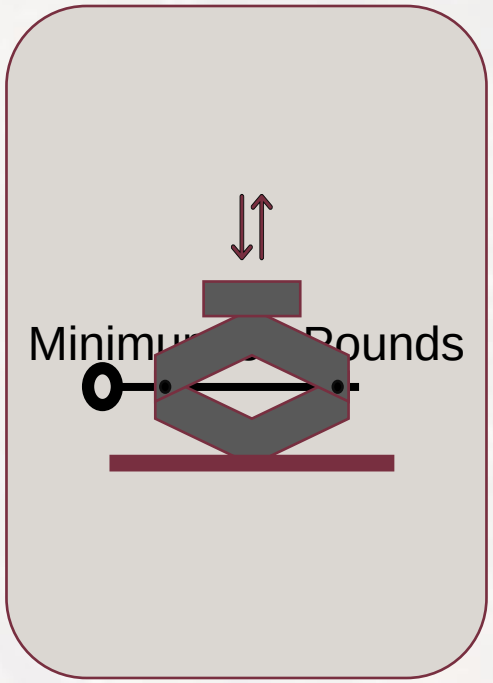
Primary Key Goals:

- Speed Up Sorting and Distribution
- Mobility
- Lifting and Handling
- Easily Sanitized
- Universal Design

Assumptions:

- Sufficient Volunteers
- Stable Environment to Store Dried goods
- Dry Goods are Already Sourced

Fall Recap | Customer Needs & Targets

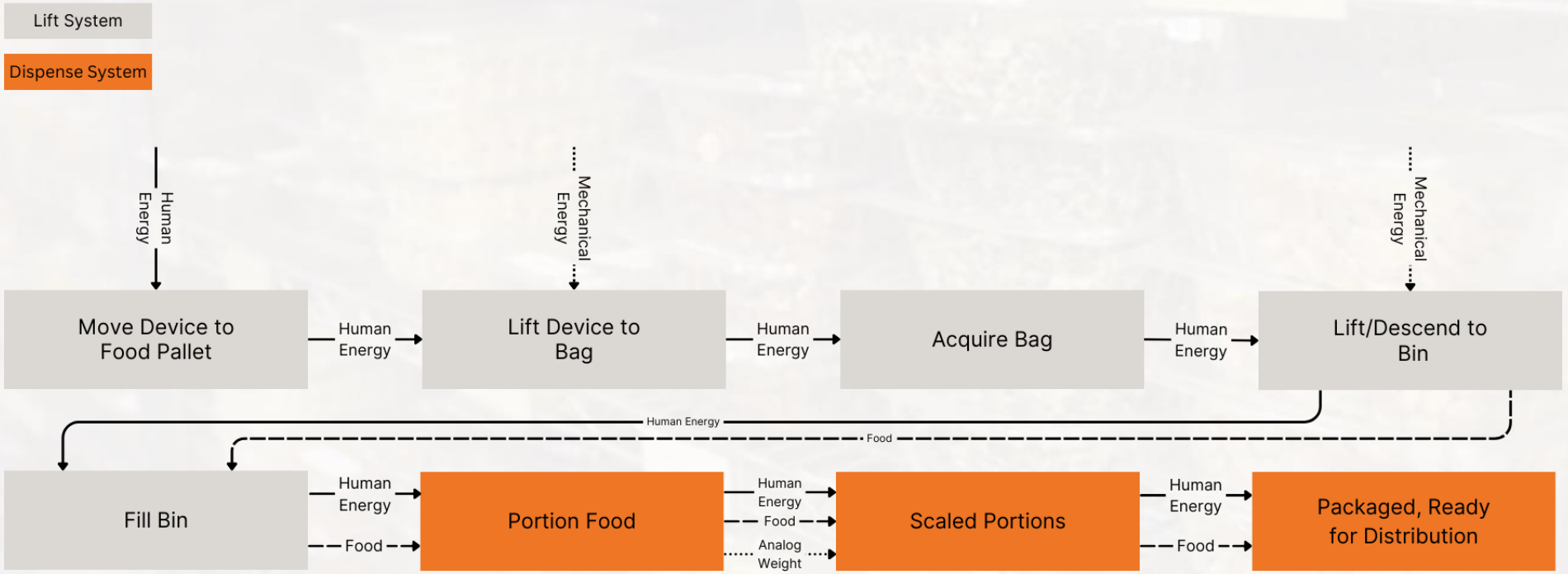


Carrying Capacity

Pallet Bounds

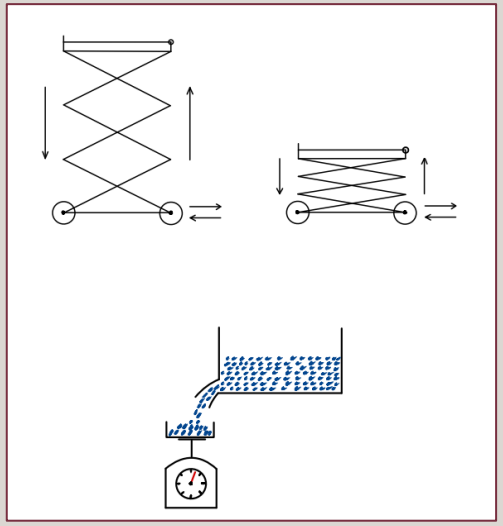
Portion Size

Fall Recap | Functional Decomposition



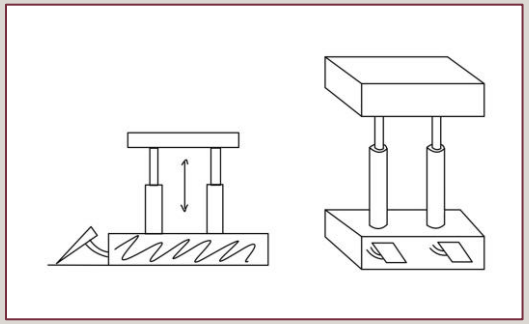
Fall Recap | Concept Selection

Scissor Lift and Scale



Alternative Value: 0.387

Foot-Powered Hydraulic Lift and Scale



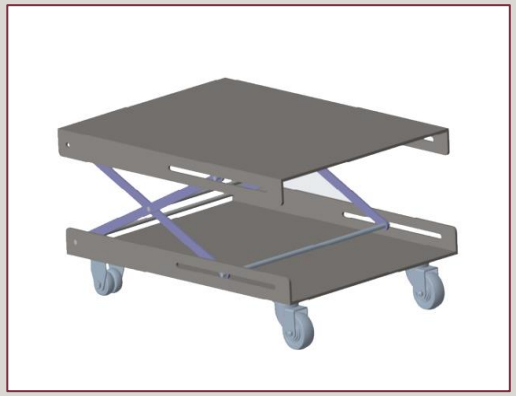
Alternative Value: 0.311

Engine Hoist-like Lift and Scale

Alternative Value: 0.302

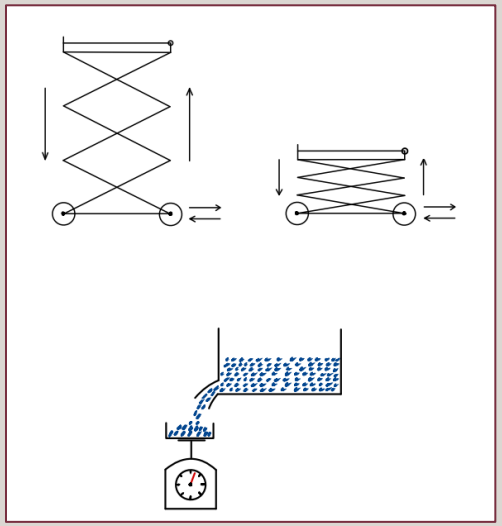
Fall Recap | First Prototype

System 1



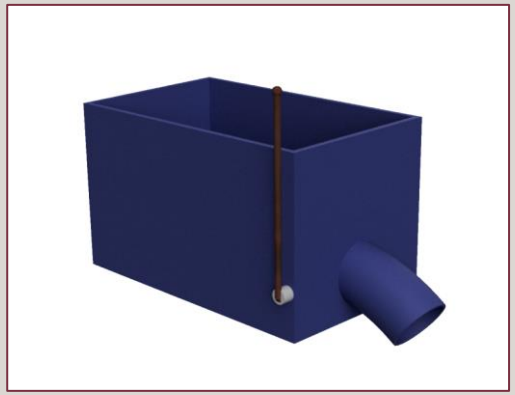
Scissor Lift

Scissor Lift and Scale



Alternative Value: 0.387

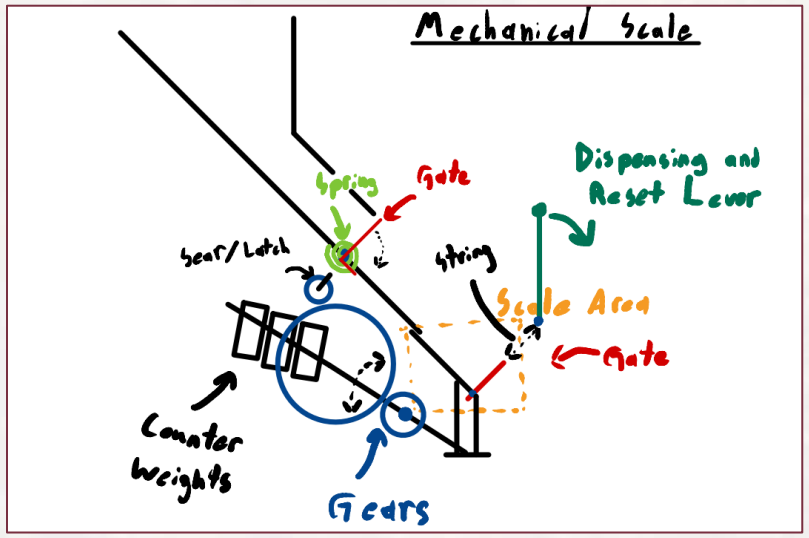
System 2



Dispenser

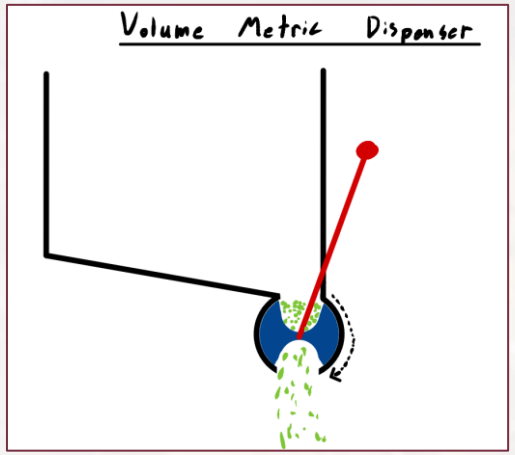
Current Work

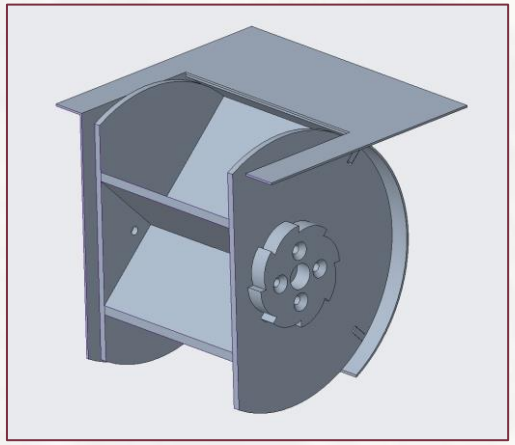
Dispensing System | First Iteration



Pros	Cons
Fully Automatic	Costly
Precise	Maintenance

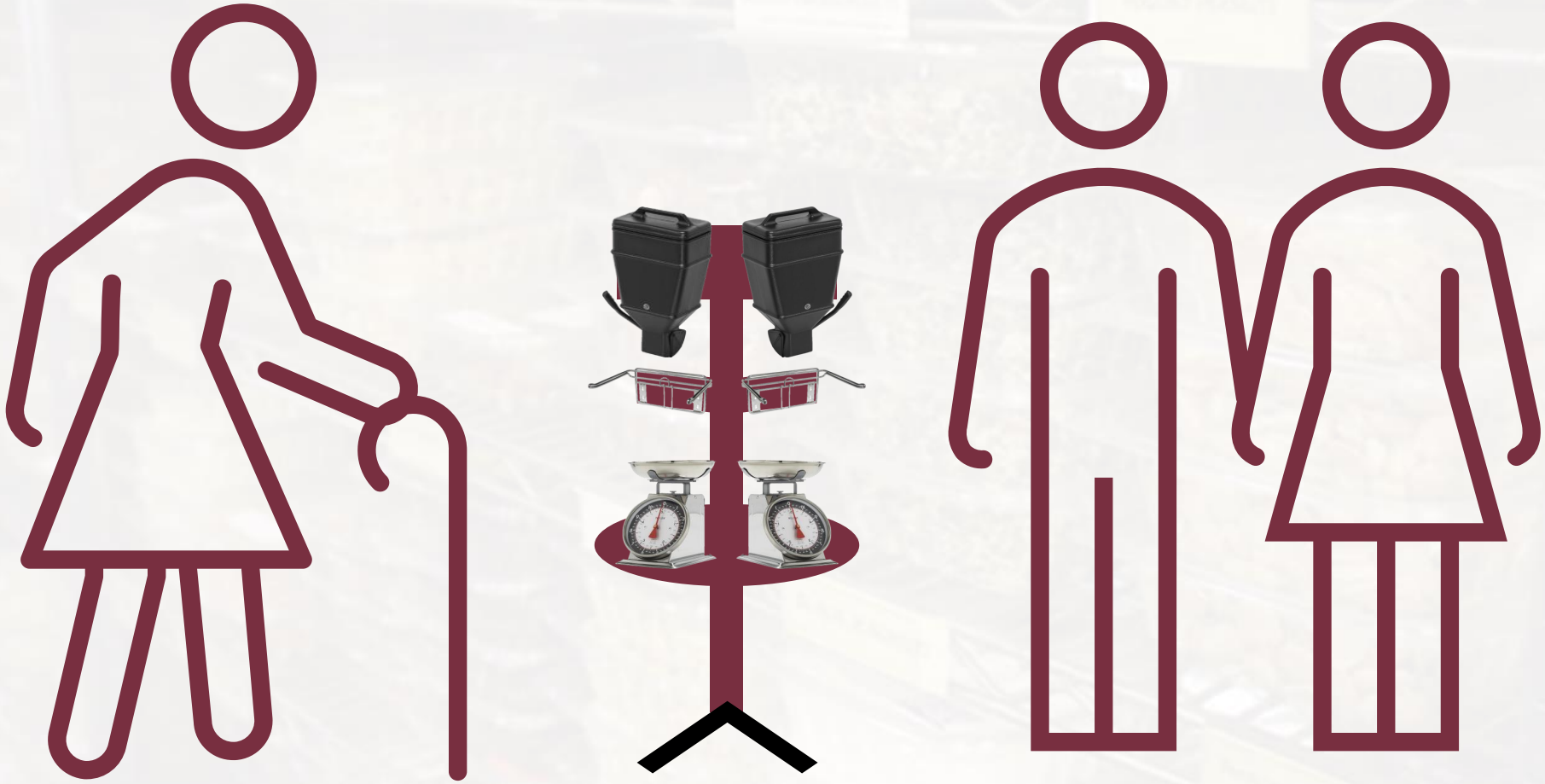
Dispensing System | Second Iteration



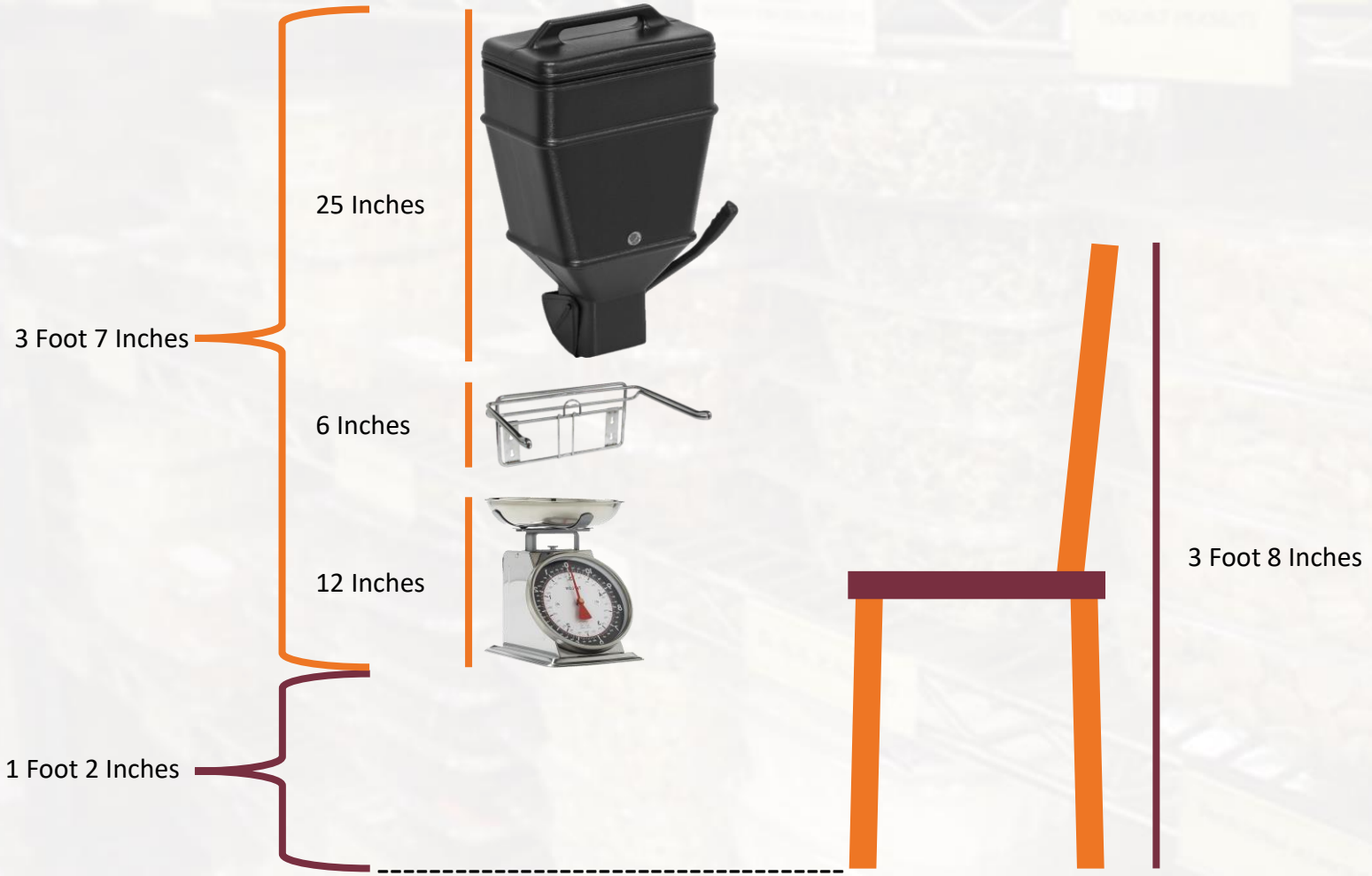


Pros	Cons
Simple	Manufacturing
Precise	Costly
Maintenance	

Dispensing System | Current Iteration



Dispensing System | Current Iteration



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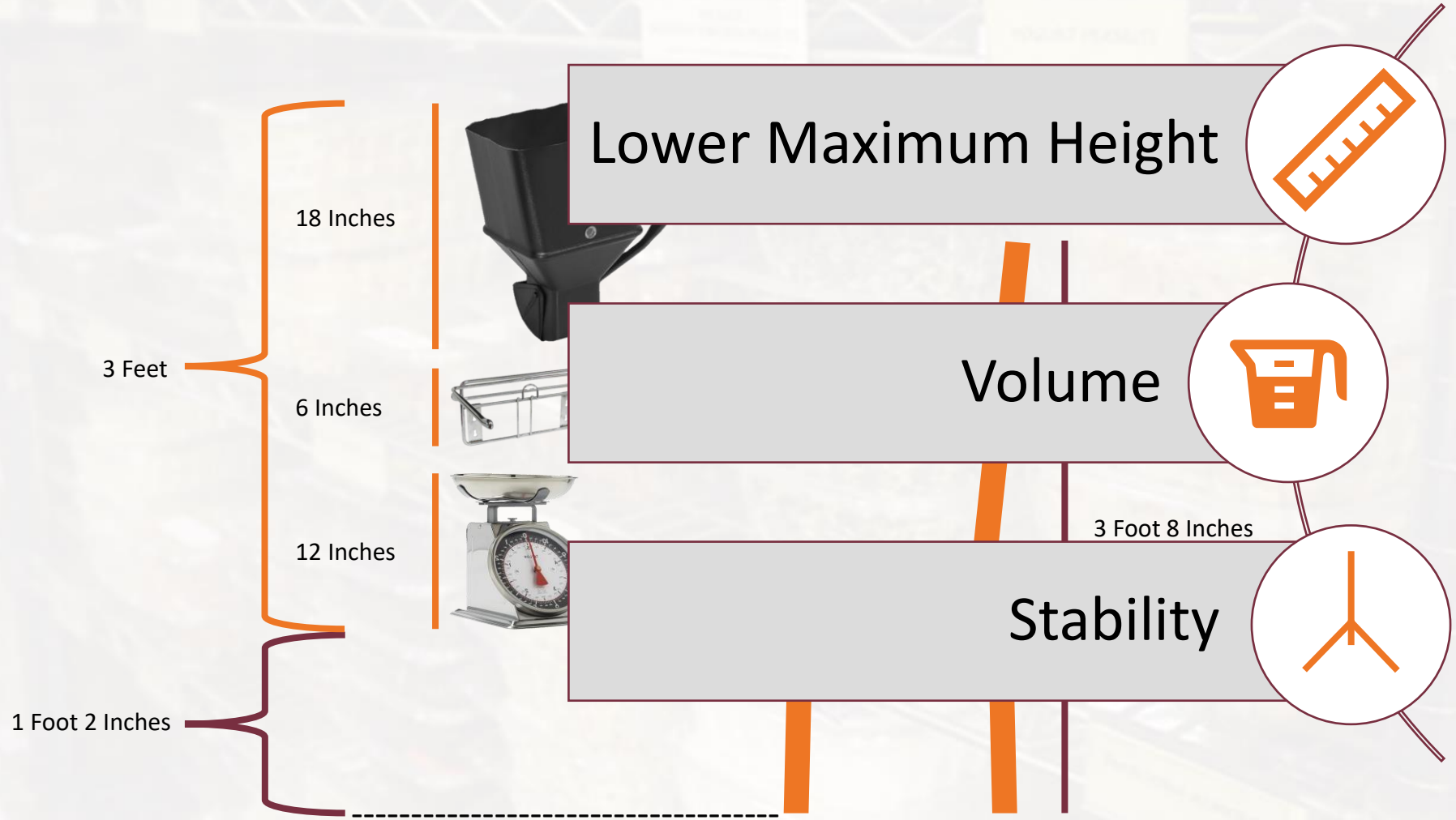
Dispensing System | Areas of Improvement



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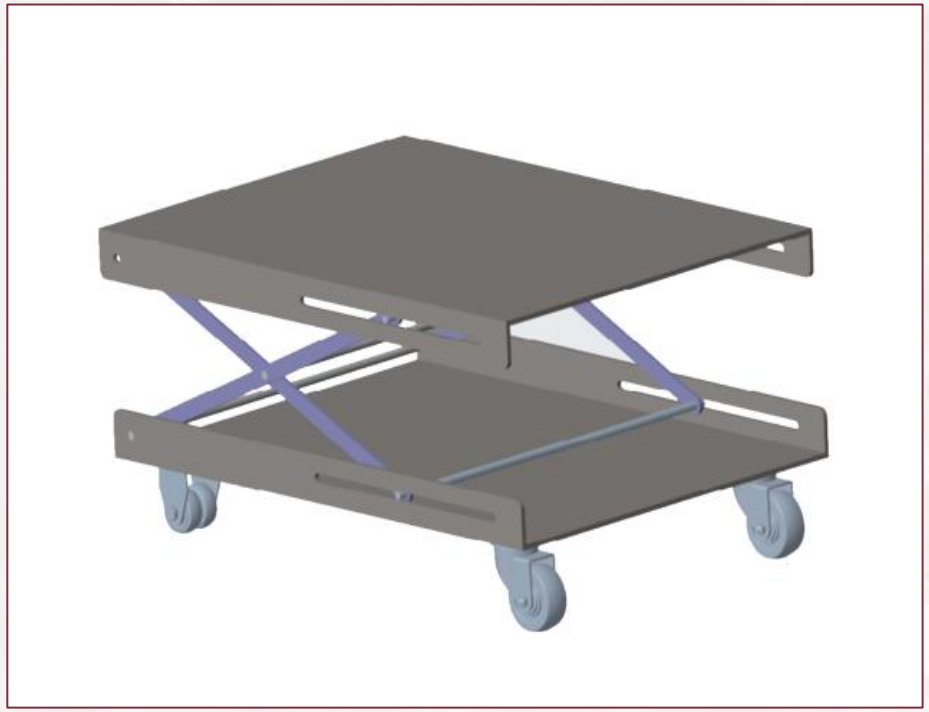
Lift System | First Iteration

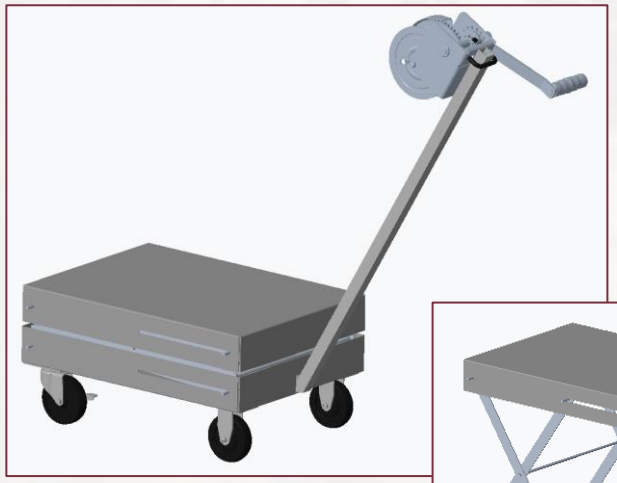


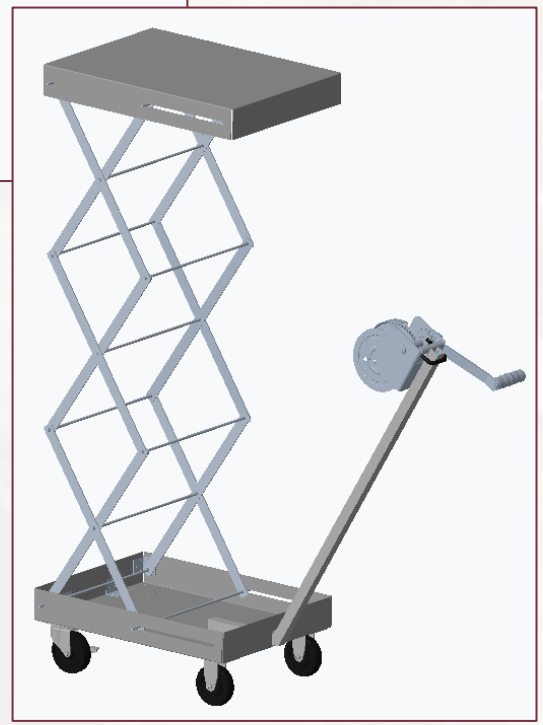
Pros	Cons
Simple	Oversized
Stable	Overweight

Lift System | Current Iteration

Pros	Cons
Compact	Costly
Stable	Tall
Tall	

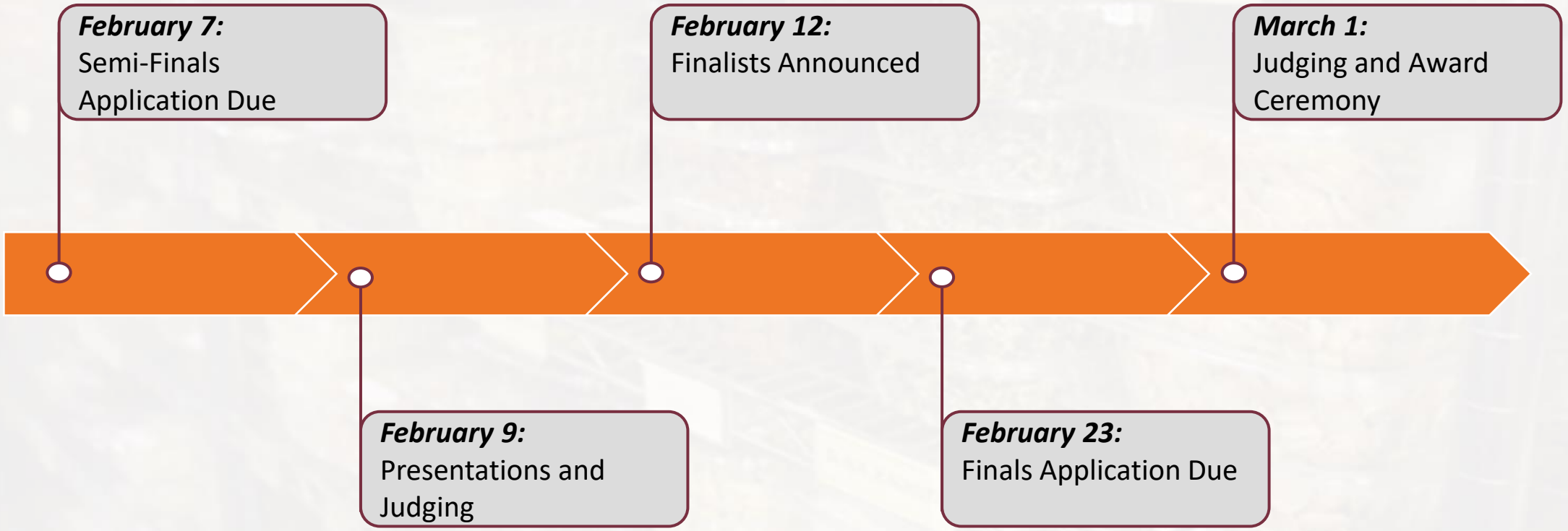
Lift System | Areas of Improvement



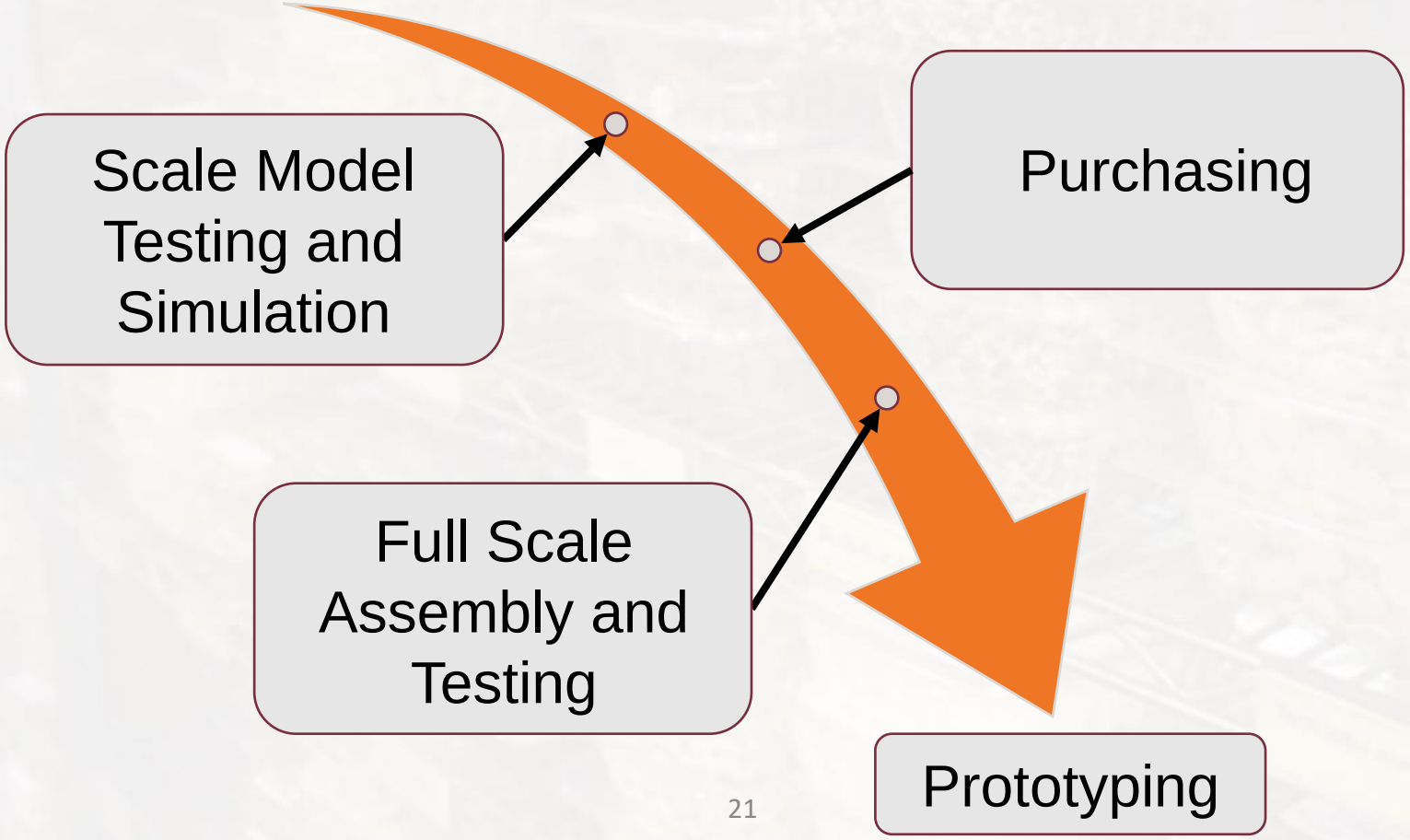


- Pulley System
- Wide Base
- Handle Support
- Packaging

InNOLEvation Challenge



Future Work


Scale Model Testing and Simulation
Purchasing
Full Scale Assembly and Testing
Prototyping

Questions?

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Backup Slides

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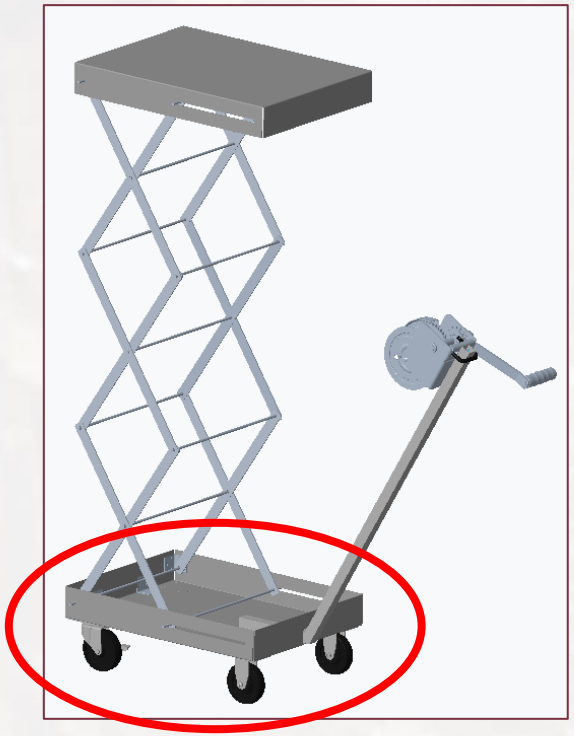
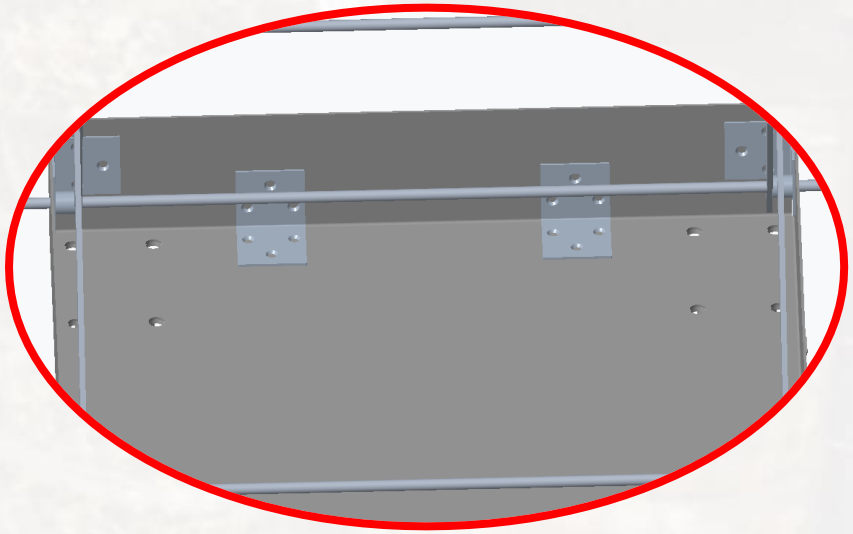
Lift System | Areas of Improvement





Targets

Function	Metric	Target
Carrying Capacity*	Pounds, lb	$50 \leq x$
Portion Size*		$1 \leq x \leq 4$
Tray Volume	Inches Cubed, $in.^3$	$3520 \leq x$
Storage Volume		$7962 \geq x$
Tilt	Degrees, x^o	$0 \leq x \leq 21$
Pallet Bounds*	Height, $in.$	$11 \leq x \leq 60$
Spout Size	Diameter, $in.$	$2 \leq x \leq 4$
Lift Velocity	Meters per Second, $\frac{in}{s}$	$5 \leq x \leq 9$
Compatible Dried Goods	Listed Dried Goods	Red Beans
		Black Beans
		White Rice

F.D Cross Reference Table

Food Distribution			
Function	System		
	Input	Monitoring	Output
Accepts	X		
Display's analog weight reading		X	
Pour	X		X
Raise	X		X
Lower	X		X
Package	X		X