FINAL PRESENTATION ON PROJECT No 2
AUTOMATIC PET FEEDER

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INTRODUCTION

- PetCare Ltd, a company specialize in pet feeder, pet foods, pet toys etc. in Vietnam with the hundreds of retailers.
- To scope with market opportunity, it has been assigned a Product Development Team to design an new model of Automatic Pet Feeder

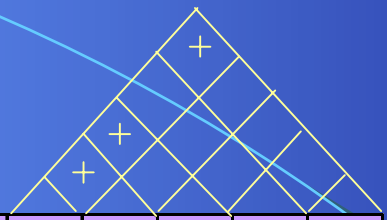
Brief mission statement

Product description: Twin compact automatic pet feeder

Key business goals:

- First Product Introduction in 3rdQ 2005
- 20% gross margin

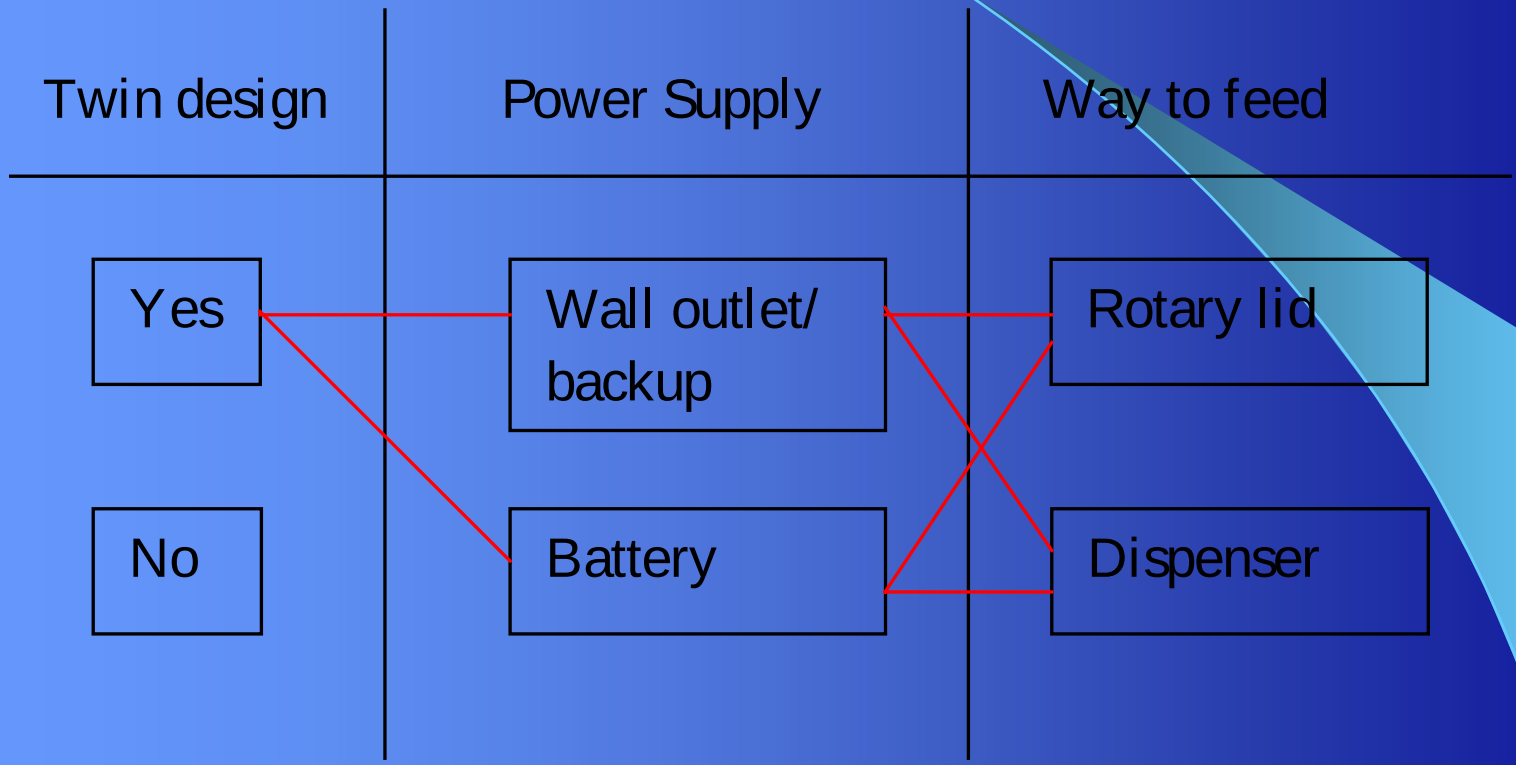
HOUSE OF QUALITY



DIRECTION OF IMPROVEMENT	↑	↑		○	○								
WHAT'S \ HOW'S	Cost of product	Range of time setting	Way to feed	Twin design	Type of power supply	IMPORTACE	PetMate	PetCS	CURRENT	FUTURE	NEED TO IMPROVE	SALE IMPACT	SCORE
Reasonable price.	9				3	5	4	4	3	5	1.7	1.5	12.5
Automatic operating		9			3	5	5	2	4	5	1.3	1.0	6.3
Rugged and compact design						3	5	3	3	5	1.7	1.2	6.0
Twin pet feeder				9		5	1	1	1	5	5.0	1.5	37.5
ABSOLUTE IMPORTANT	113	99.3	69.6	338	72.3								
RELATIVE IMPROTANT	12%	16%	8%	37%	8%								

Concept Generation

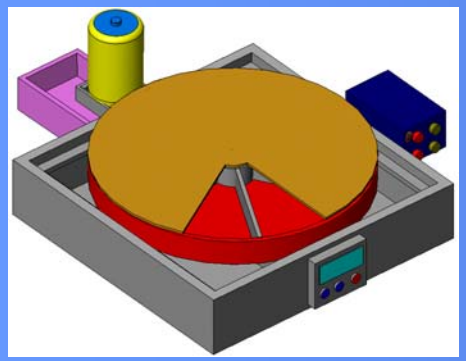
COMBINATION TREE



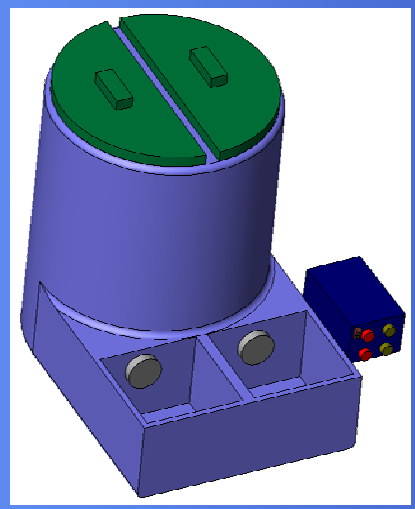
Concept Generation (cont.)

RESULT:

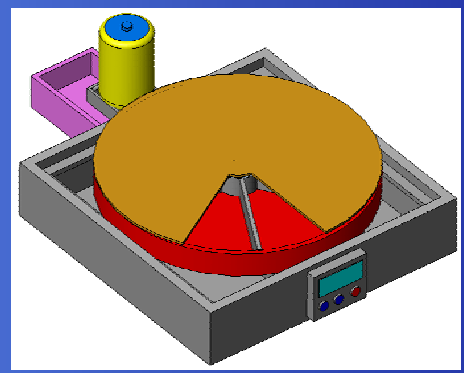
Solution #1: Twin design/Wall outlet with backup/Rotary lid
Solution #2: Twin design/Wall outlet with backup/Dispenser
Solution #3: Twin design/Battery/Rotary lid
Solution #4: Twin design/Battery/Dispenser



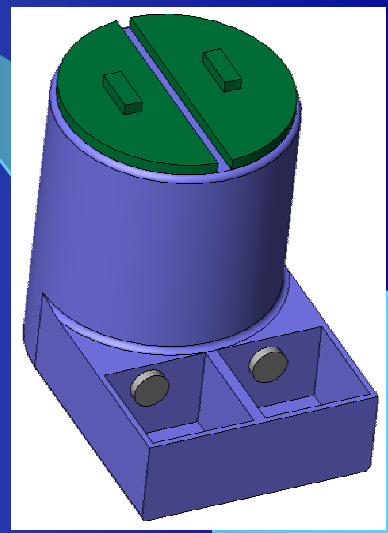
Solution #1



Solution #2



Solution #3

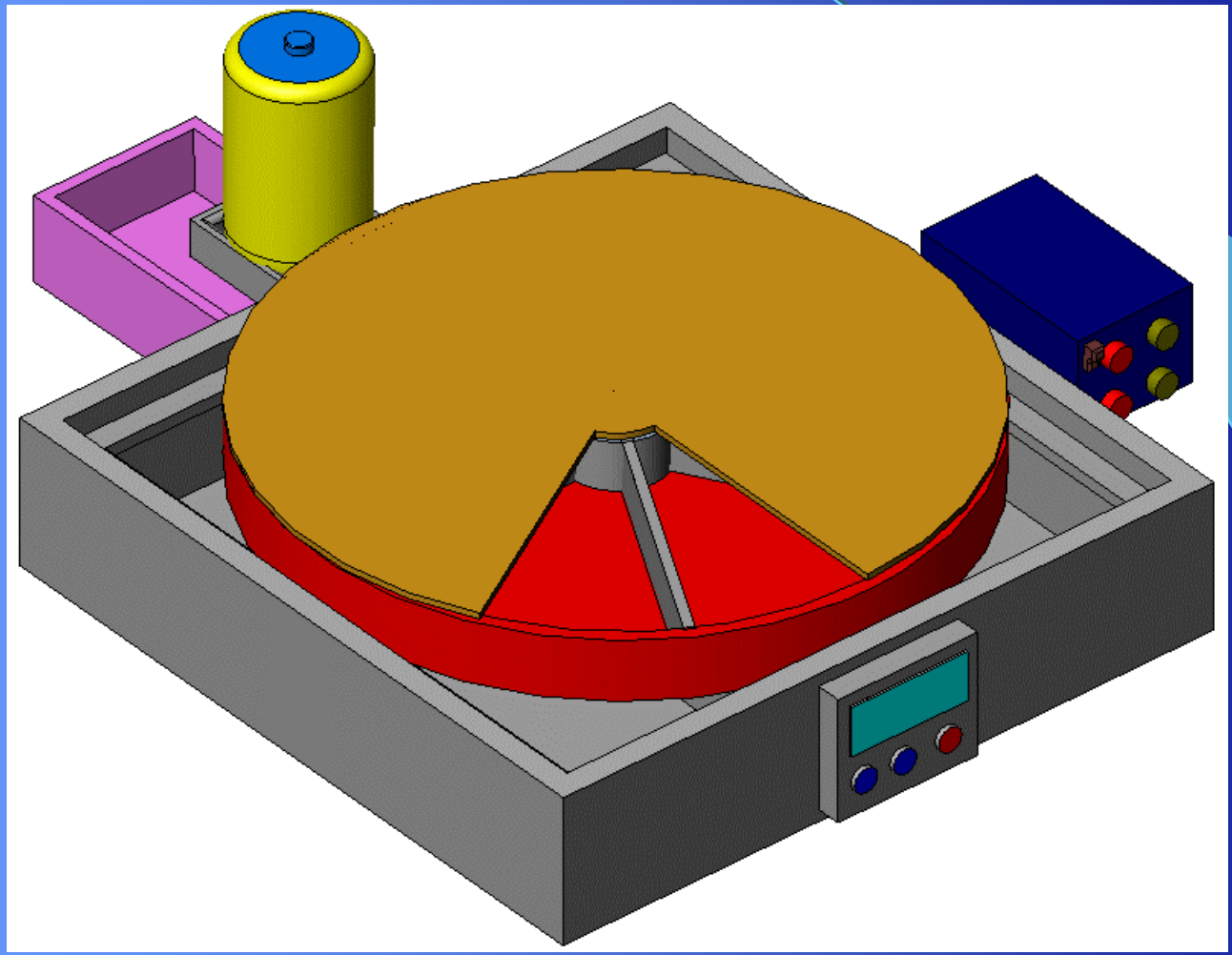


Solution #4

Concept Selection

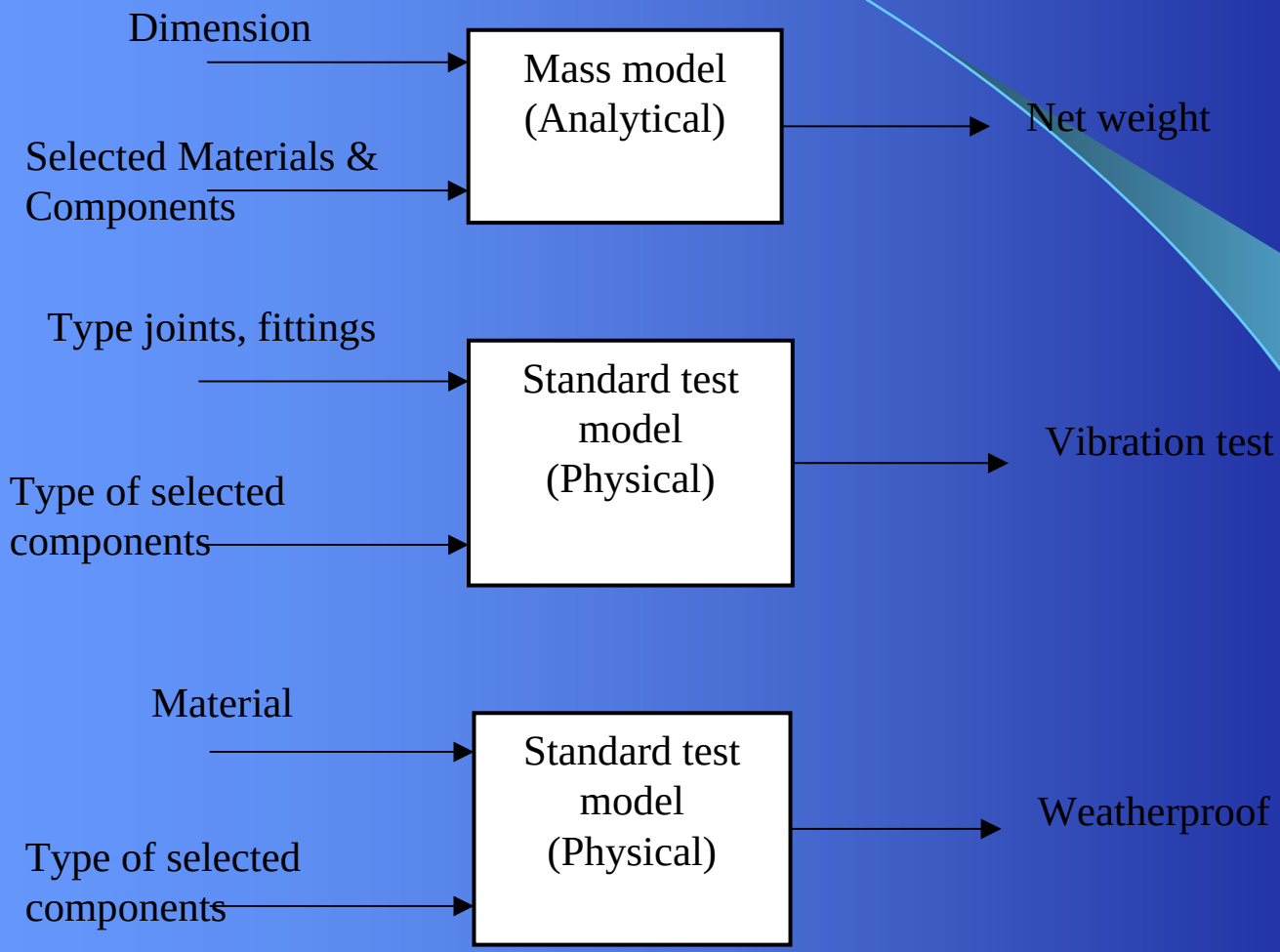
RESULT:

Solution #1: Twin design/Wall outlet with backup/Rotary lid



FINAL SPECIFICATIONS

Develop the technical model of product



FINAL SPECIFICATIONS (Cont.)

Develop the cost Model of the Product

- Selling price : 110$
- Retailer's Margin: 20%
- Company's Margin: 25%
- Target manufacturing cost: 66$

FINAL SPECIFICATIONS (Cont.)

Develop the cost Model of the Product

Part/Component	Qty.	High ($)	Low ($)
Frame	1	4	3
Power	1	8	5
Control system	1	20	17
Food block	1	13	11
Water block	1	4	3
Misc.	-	3	3
Assembly (25$/hr)	15 min	4.2	4.2
Overhead (25% of direct cost)	-	14.0	11.5
Total manufacturing cost		70	58

Part decomposition:

Component	Type of component
Food tray(including lid)	Designed
Stepping motor	External standard
Control panel	Internal standard
Control board	Internal standard
Control program	Internal standard
Electronic components	External standard
Power supply	External standard
Water container	Designed
Water bowl	Designed
Base	Designed

Assembly plan:

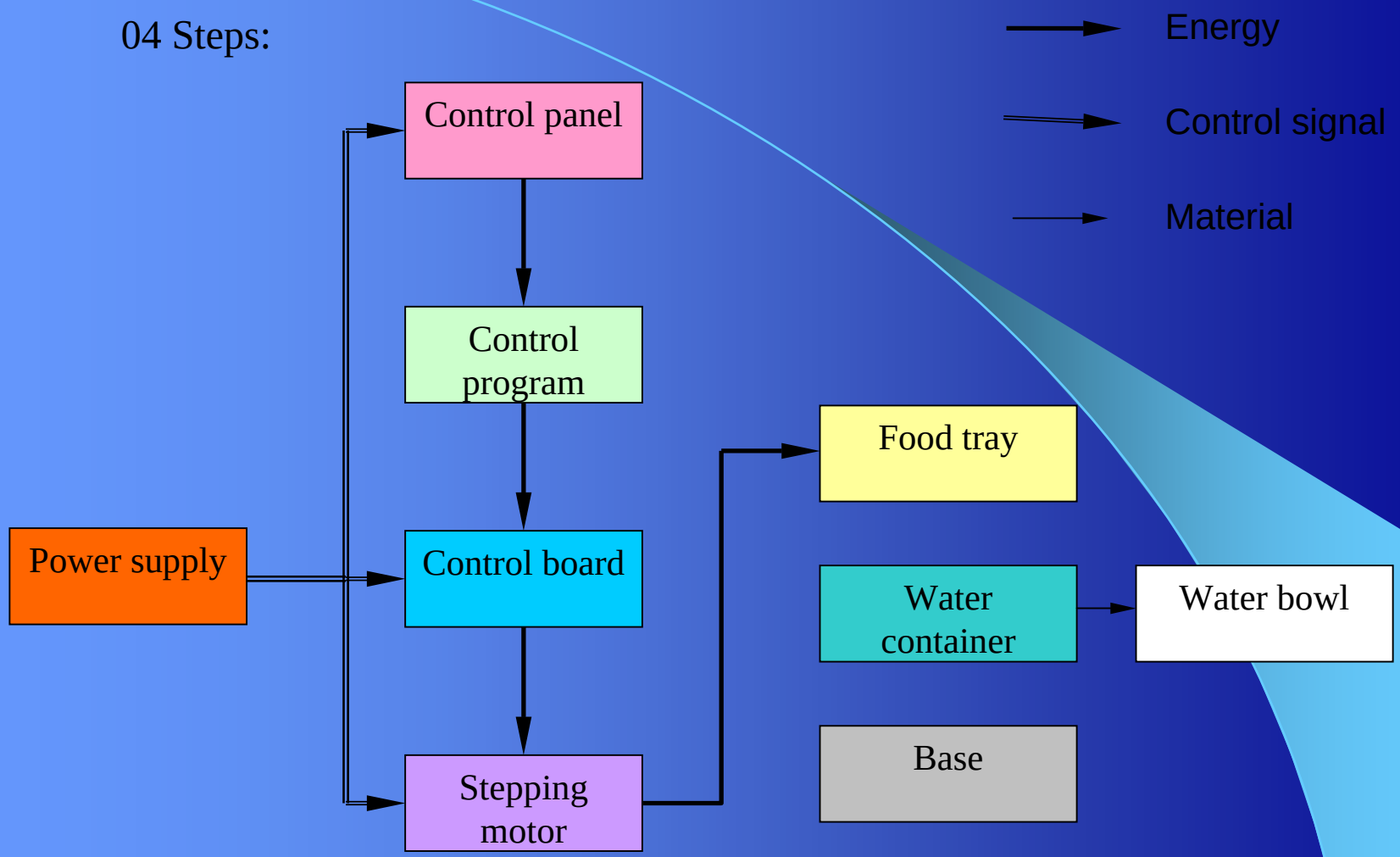
- Firstly, secure the base
- Secondly, Put the control board on the support of the base
- Thirdly, put the food tray on top of the base
- Fourthly, we put the water container on the base
- Finally, The food tray has the stepping motor inside it, next the cover lid is put on the motor.

Material-First Approach is used to select material and process for food tray and base.

Application requirement	Removable, easy to clean
Feasible material class	PVC, stainless steel
Candidate process type	Molding, drilling, cutting, welding
Part requirement	Rugged, compact
Feasible process type	Molding, drilling

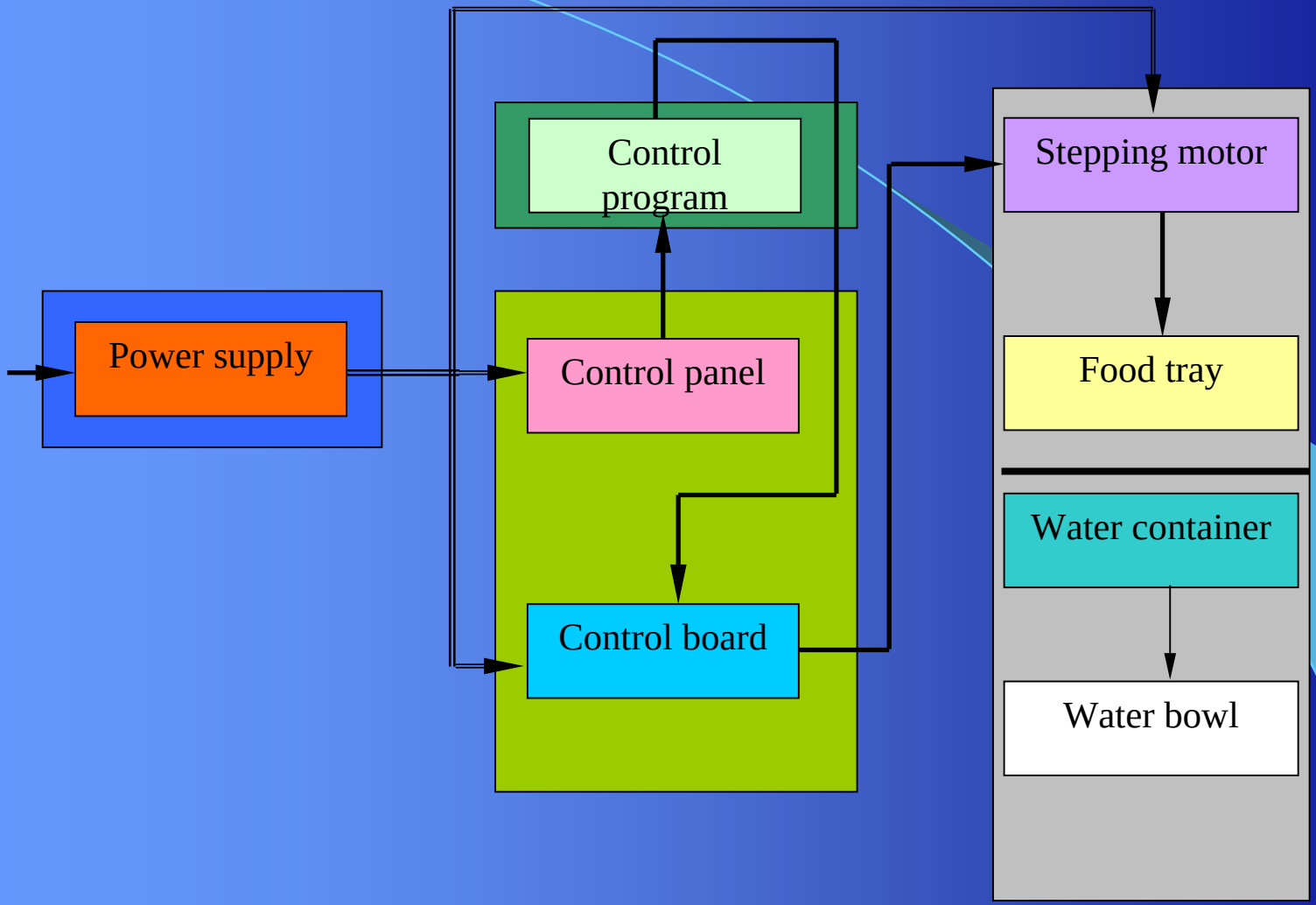
PRODUCT ARCHITECTURE

04 Steps:



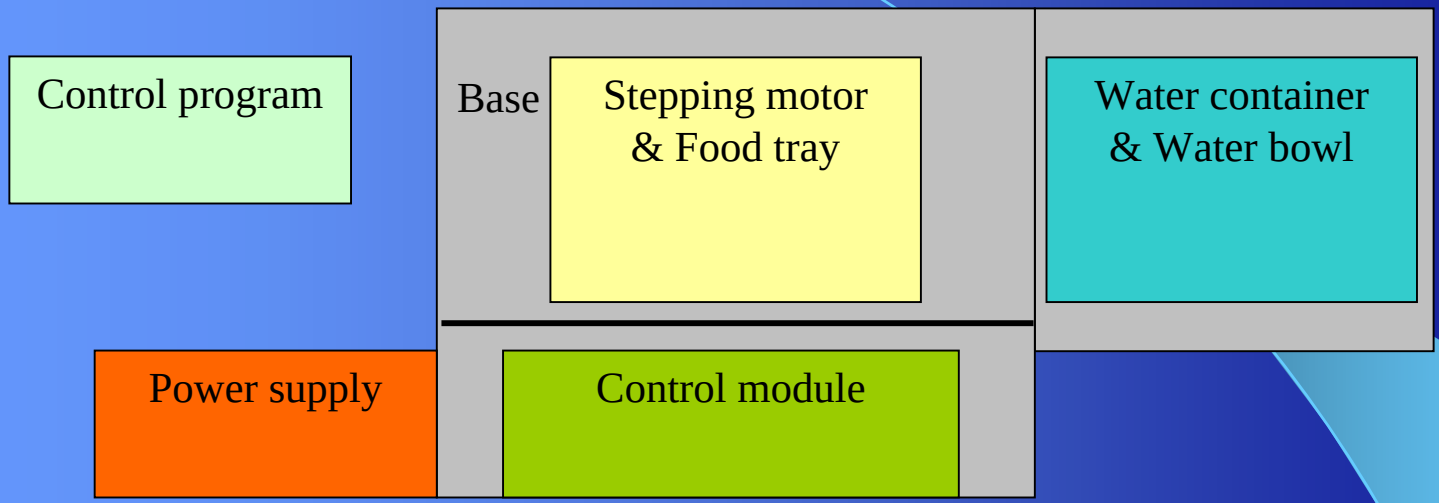
STEP 1: Create schematic for pet feeder

PRODUCT ARCHITECTURE (Cont.)



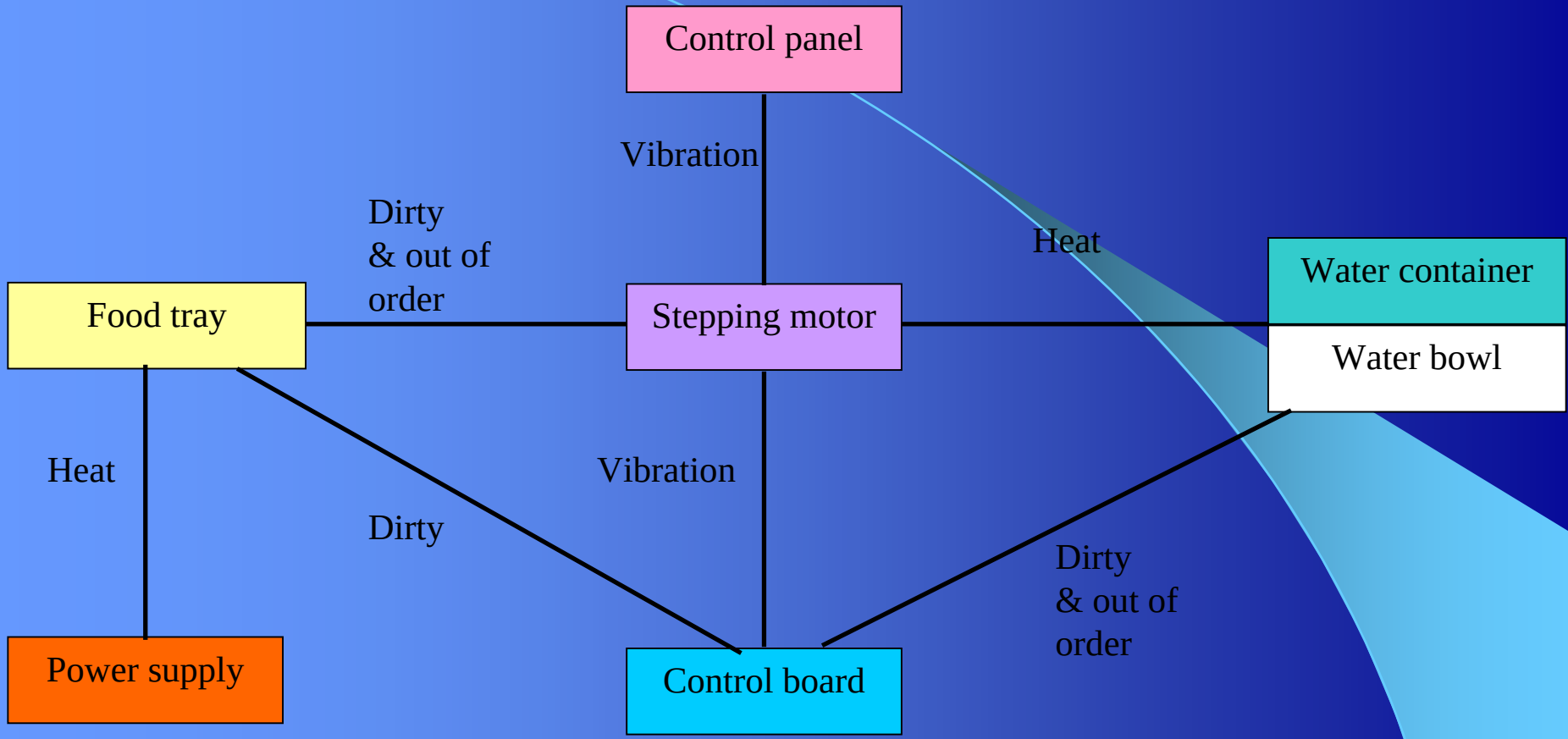
STEP 2: Cluster the element of the schematic

PRODUCT ARCHITECTURE (Cont.)



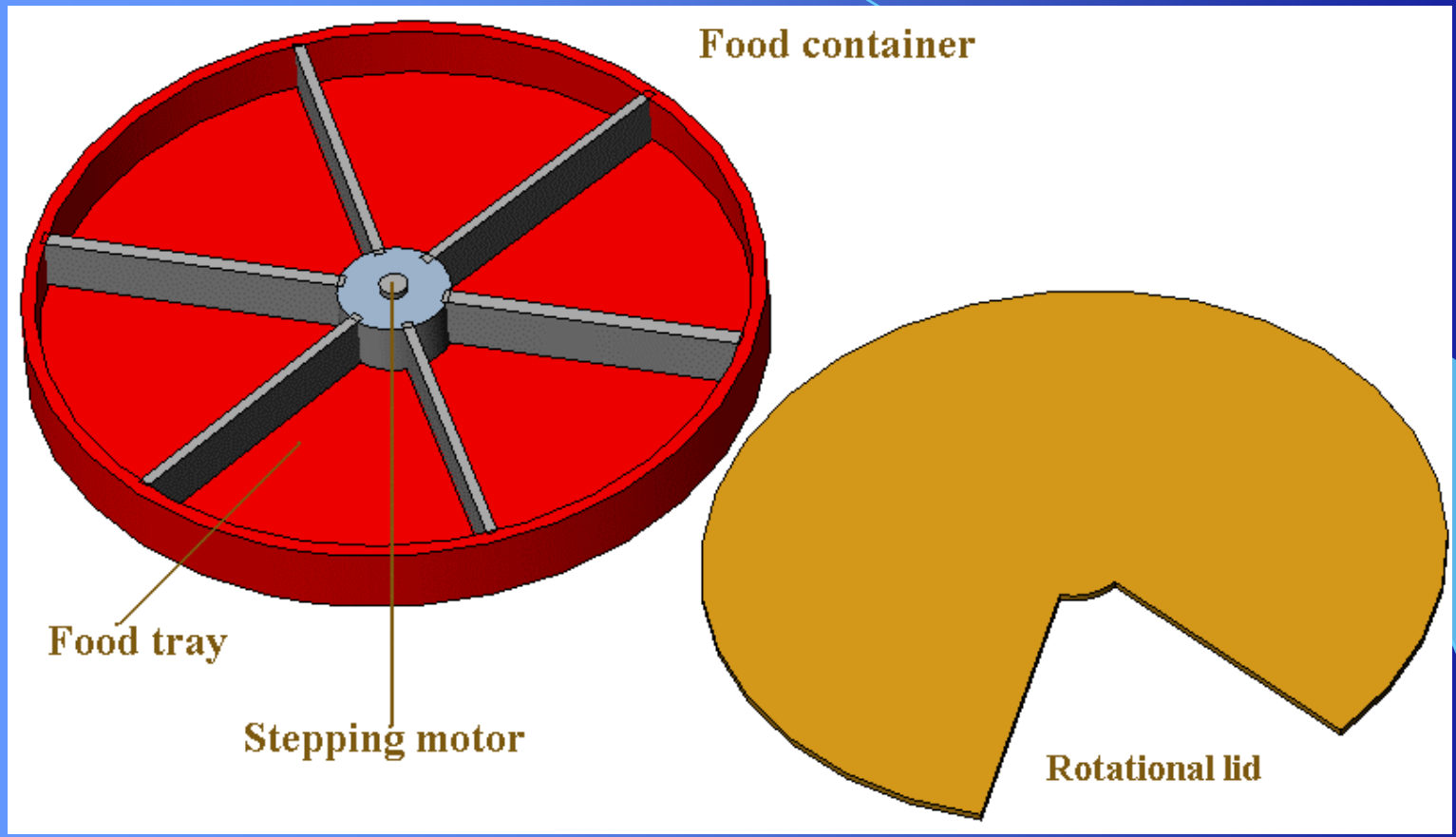
STEP 3: Create a rough geometric layout

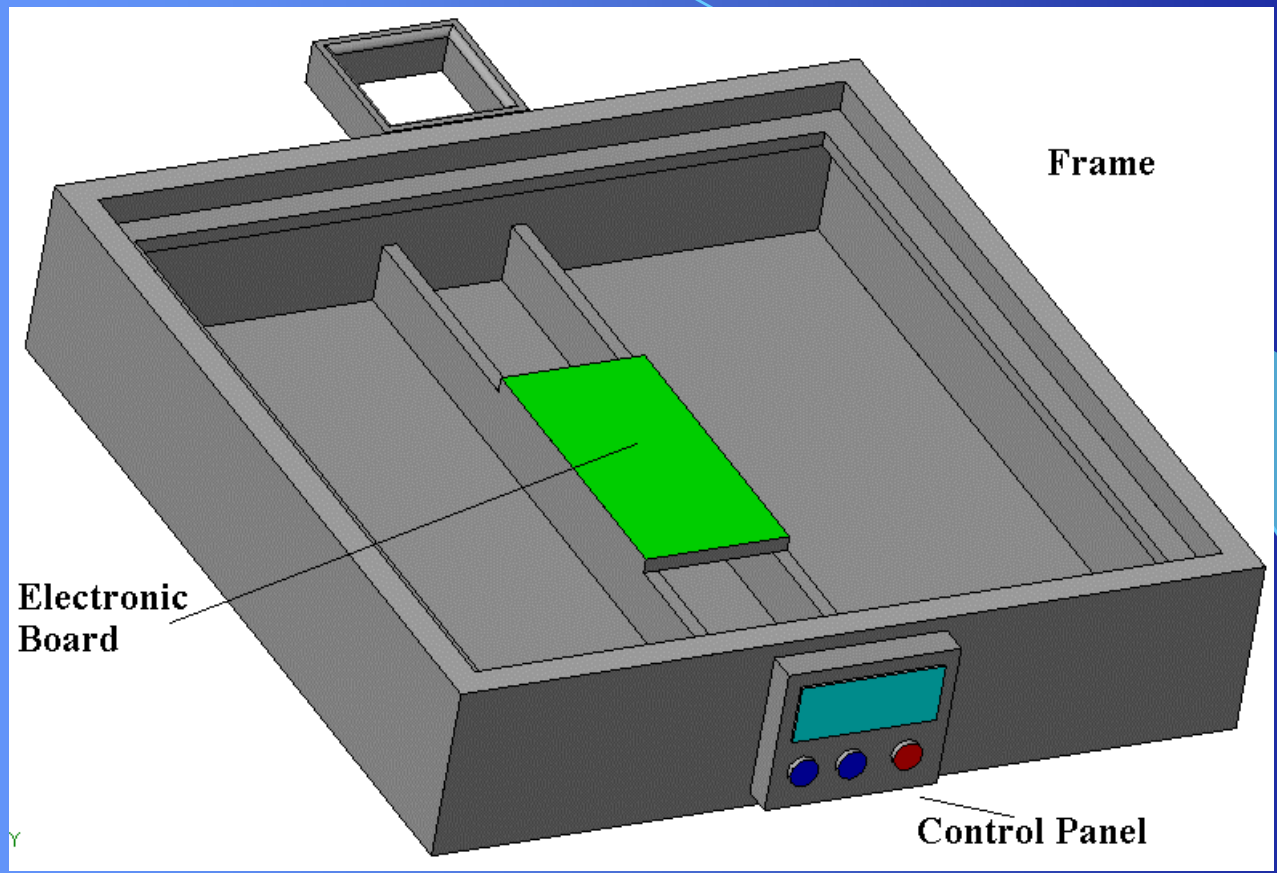
PRODUCT ARCHITECTURE (Cont.)



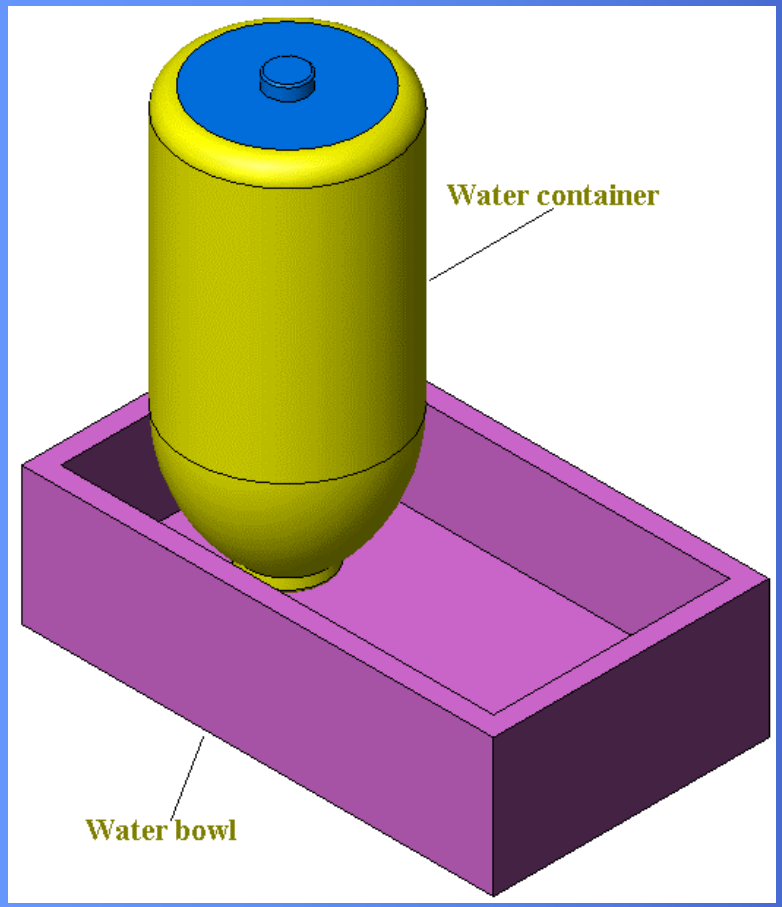
STEP 4: Identify the fundamental and incidental interaction

PROTOTYPING AND DEMONSTRATION

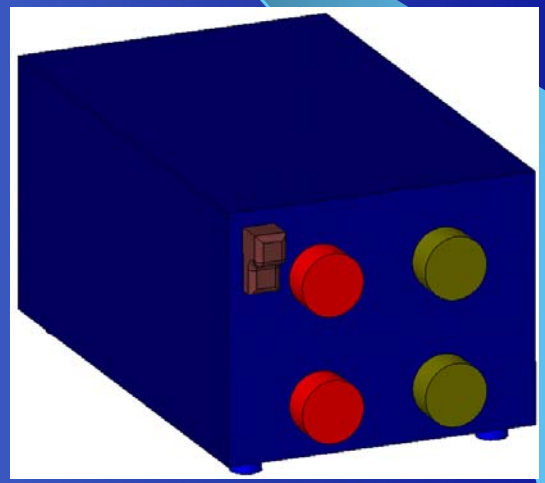



Frame
Electronic
Board
Control Panel

PROTOTYPING AND DEMONSTRATION

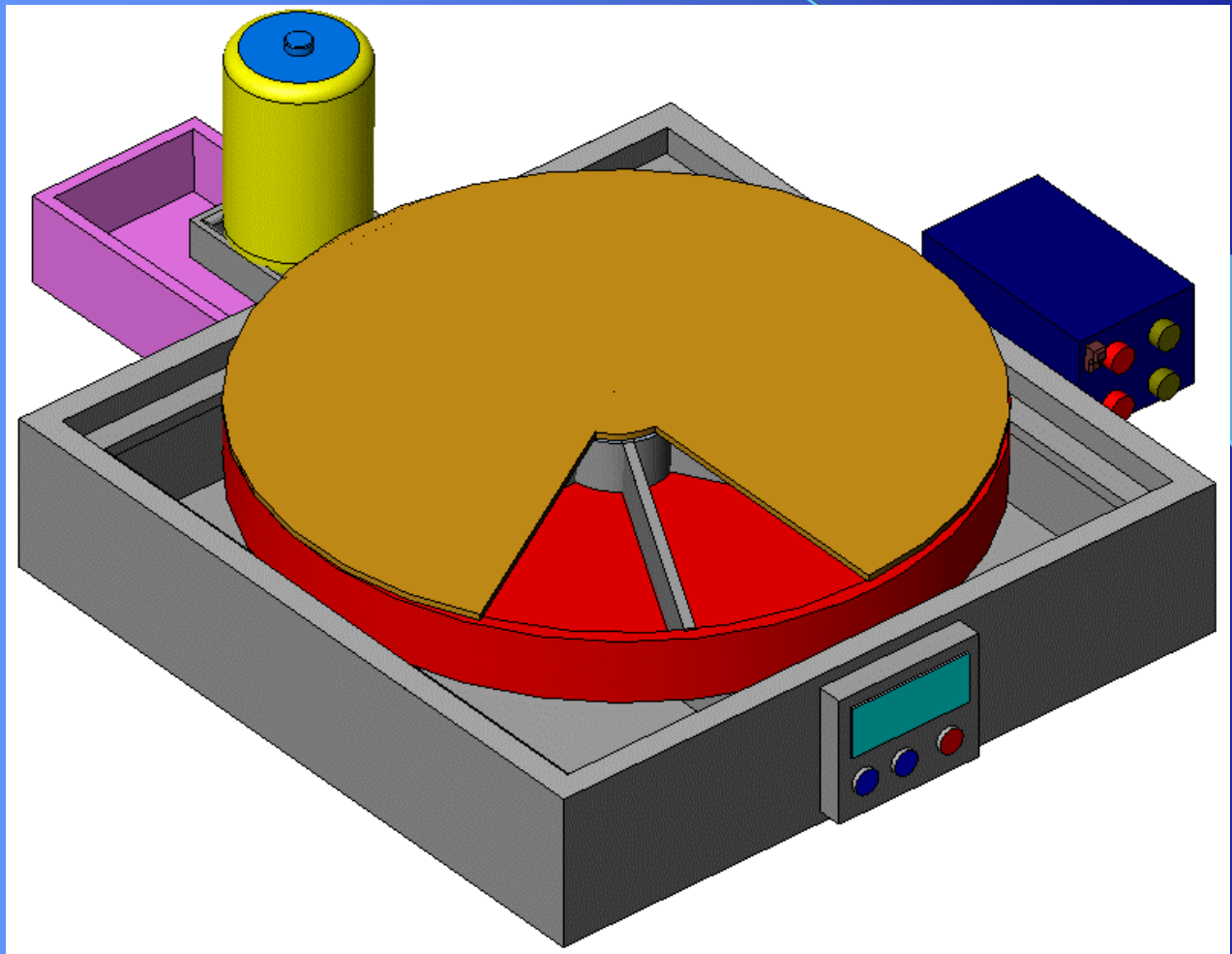


Water container



Power supply

PROTOTYPING AND DEMONSTRATION (Cont.)



PROTOTYPING AND DEMONSTRATION (Cont.)

Real prototype

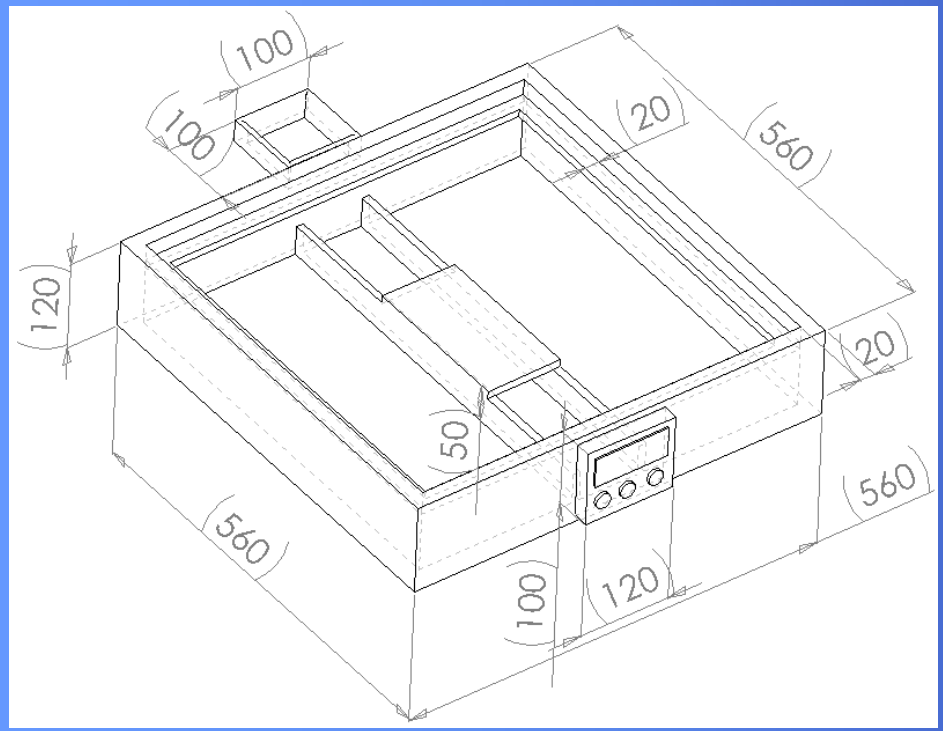
DETAIL DESIGN

Bill of materials:

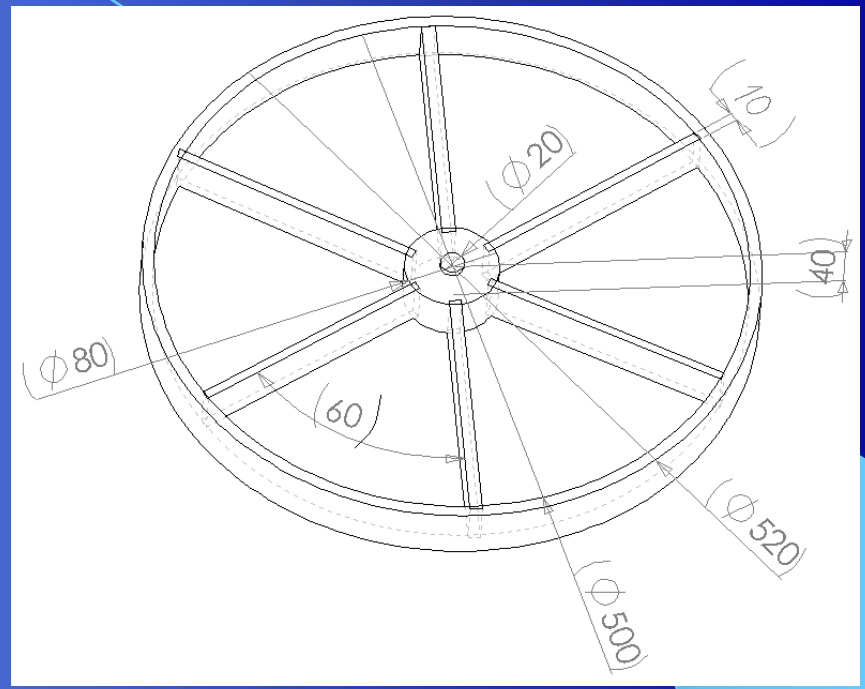
Components/Parts	Qty	Material	Value & Standard
Power Supply	1	-	12 DVC- ATX12V 2.01
Base	1	PVC compound	
Food tray	1	PVC compound	
Water Container	1	Transparent Plastic	
Water Bowl	1	Transparent Plastic	
Printed Circuit Board	1	-	DEEE
Control Button	3	Plastic	
7-Segment Led	4	Plastic	
Micro controller 8951	1	Silicon	
Stepping Motor	1	Steel + Cu	5V, 200mA, 2 phase, 1.8° step angle, 200 full steps per rev. MS23 standard
Resistance	3	-	
LM7805	1	Silicon	
SLN2803A	1	Silicon	
Capacity	1	Ceramic	
Heat sink	1	Al	
Dowd load Kit for AT89C51	1	-	
Software Program	1	-	Assembly Language
Screw	8	Steel	
Switch	1	Plastic	
Wire	0.5 mm	Plastic	

DETAIL DESIGN (Cont.)

Details drawings



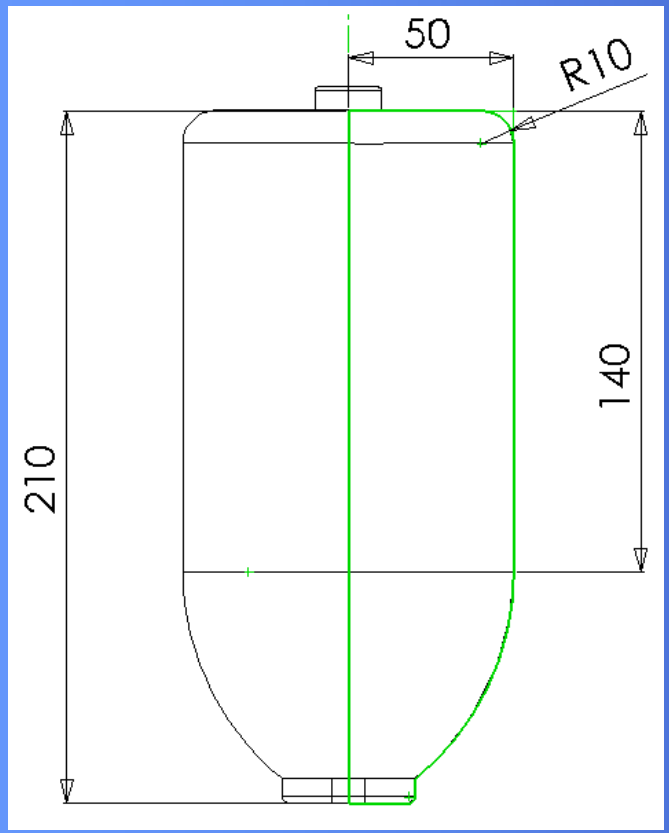
Frame



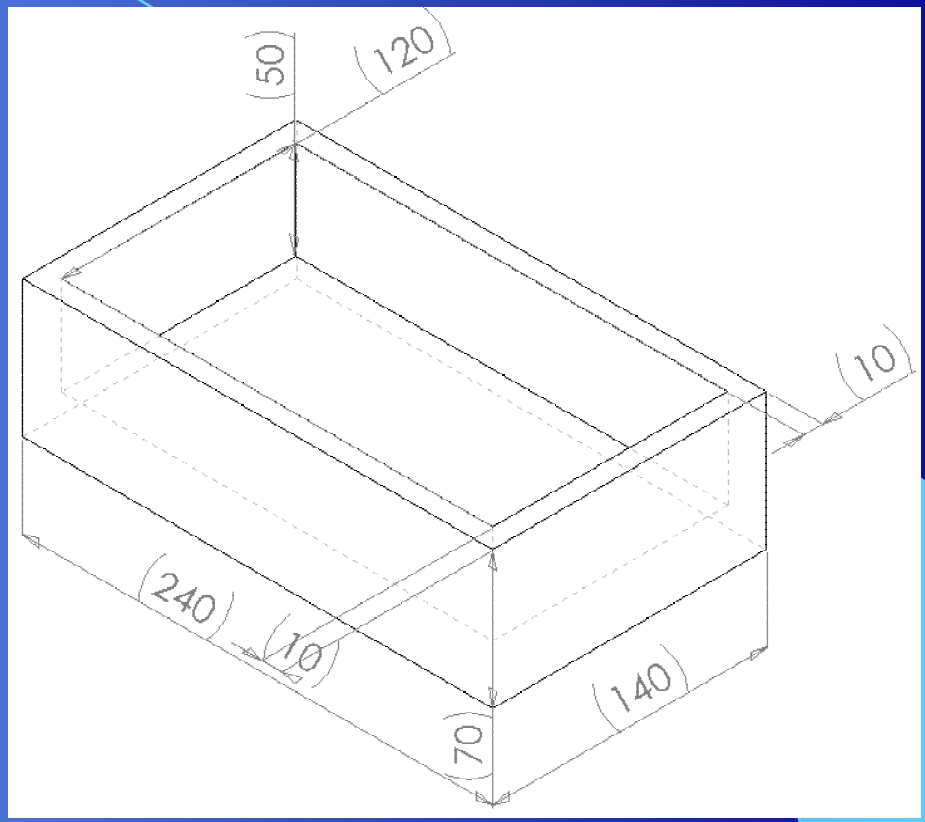
Food container

DETAIL DESIGN (Cont.)

Details drawings



Water container



Water bowl

CONCLUSION

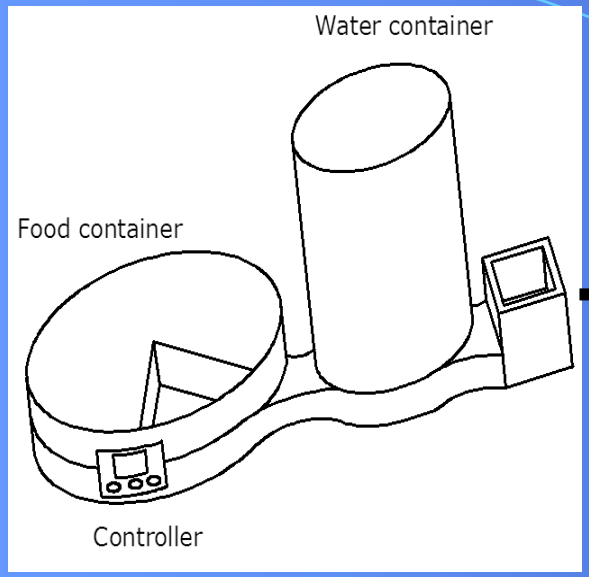
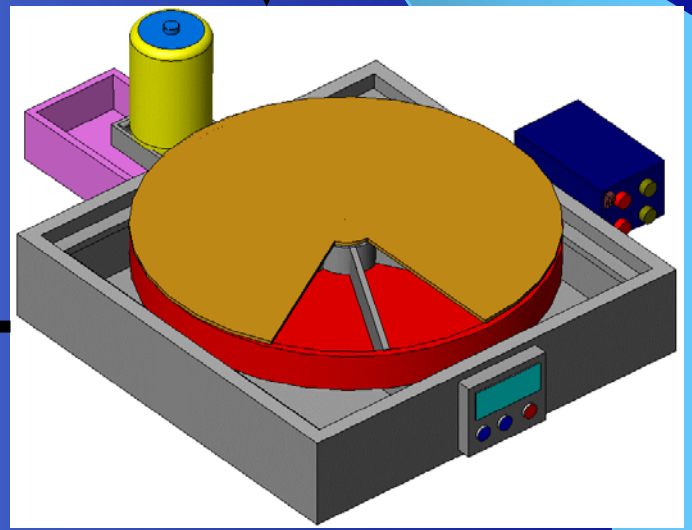


Figure 01: Solution with rotary lid



CONCLUSION (Cont.)

During the 8-week period, the project team has almost completed the product development process for the market-pull product from taking into consideration of market opportunities up to refining specifications and some parts of System Level Design. The concrete result of these process are:

- Selected concept
- Final specifications
- Product architecture
- Prototype and its demonstration
- Bill of materials

CONCLUSION (Cont.)

The above results are the fundamentals for the next step of products development process. Therefore, there exists a strong believe that the new series of Automatic Twin Pet Feeder shall gain significant market share in Vietnam as well as in some South East Asian Countries and successfully achieve all target goals established in its mission statement during whole life of its product lifetime.

THANK YOU

and enjoy

Demonstration