



Inventory Management System

TEAM
DESIGN

Abstract

This product presents an Automated Inventory Monitoring System designed to streamline inventory management for small items such as screws, nuts, and bolts. The system incorporates weight-based smart baskets, and a conveyor belt to enable real-time tracking and efficient handling. The system continuously monitors inventory levels, triggering automated alerts when stock reaches predefined thresholds to ensure timely restocking. Machine learning algorithms process historical data to optimize order quantities.

Primary Functions

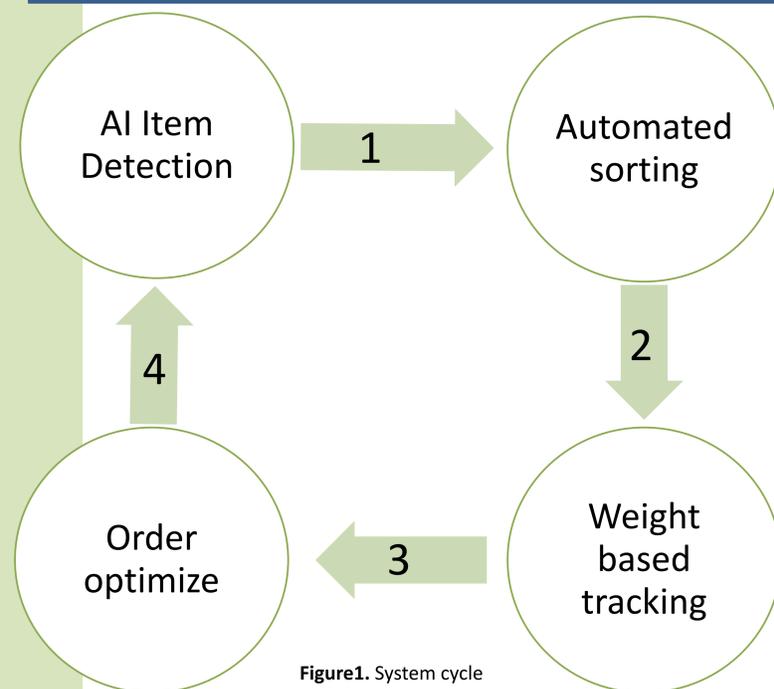
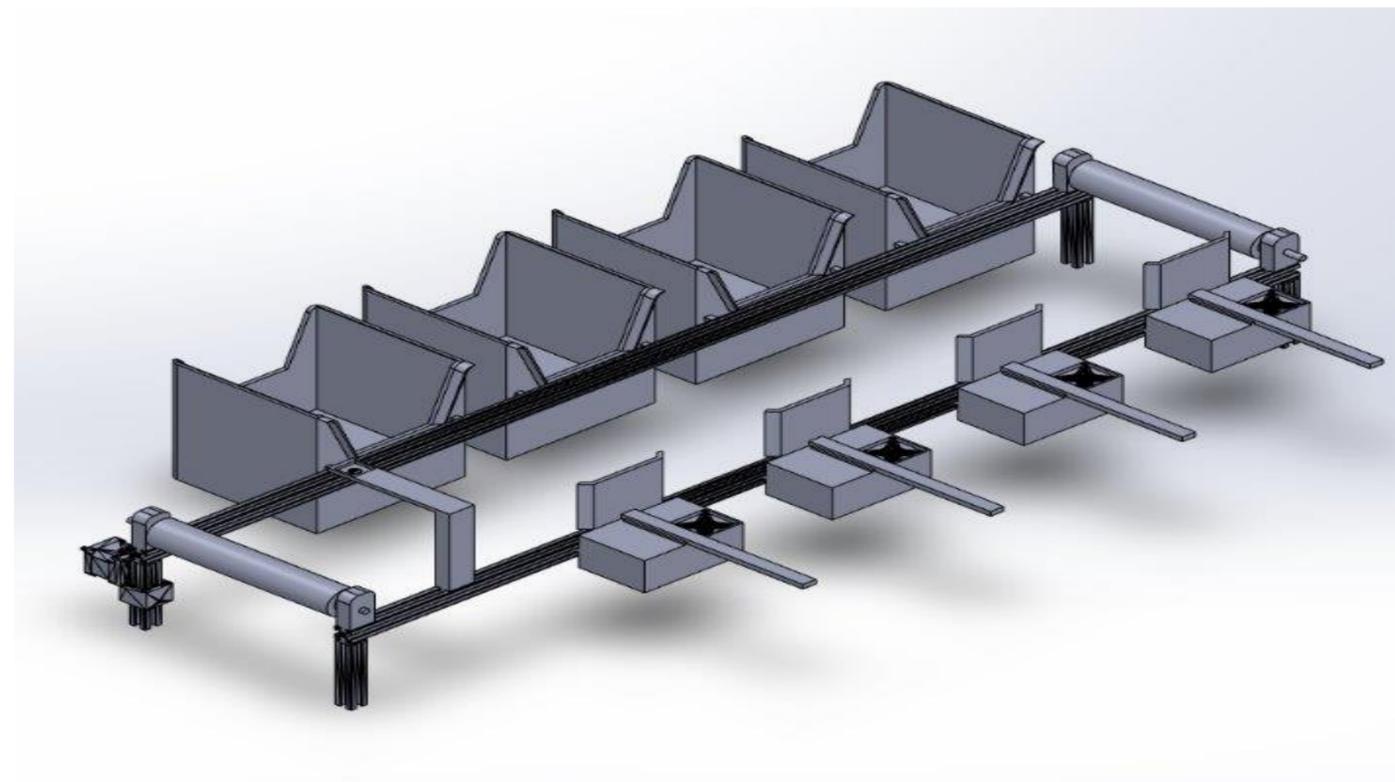


Figure1. System cycle

System Assembly (CAD)



Bill of Materials

#	Part	Quantity	Cost per item (SR)
1	Nema 17 motor	5	40
2	60oz Bearing	4	6
3	2020 extrusion	2	250
4	Shaft	4	10
5	Roller	2	20
6	Weight sensor	4	5
7	ESP 2.0	4	15
8	Arm	4	15
9	Bearing Mount	4	20
10	Camera mount	1	10
11	Basket	4	15
12	Arm stand	4	15
13	Motor mount	5	5
14	Raspberry Pi	1	500
15	Belt	1	250
Total		49	2929

Table1. Bill of Materials

Constraints

Budget

- 3000 SR

Time

- 16 Weeks

Functional

- Mixed Inventory
- Item detection

Design

- Ergonomic
- Scalable

Product Validation

Response Time

- Item Identification Avg. Time: 0.39 s

Sorting Accuracy

- Successful Item classification: >94%

Forecasting Techniques

- Winter's Method mean avg. error: 5.05%

Multidisciplinary Roles

Computer Eng.

Programming algorithm
Database setup

System Integration

Design Optimization

System Design

Quality Control

Analysis and assembly

Facility Layout

Optimization methods

Mechanical Eng.

Industrial Eng.

TEAM - 04

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