Project Overview

PSI Control Solutions needs a system to maintain “shop parts” including nuts, bolts and washers. By redesigning the storage devices, and implementing a process for ordering, receiving and storing, PSI Control Solutions can maximize return on investment, while minimizing chances for stock-outs.

System Criteria and Customer Priority

1. Autonomous: 21%
2. Productivity: 30%
3. Ease of Use: 14.9%
4. Ongoing Cost: 12.6%
5. Implementation Timeline: 6.3%
6. Implementation Level of Effort: 3.2%
7. Initial cost: 3.0%
8. Scalability: 5.4%

2 Bin KanBan Design

This is designed to signal workers to reorder, while still having parts in stock. This lowers the chances of stock-outs. The workers pull from one bin until it is empty, and then they switch to the second bin while at the same time placing an order to replenish the items in the first bin.

Ordering Process

- Purchase orders are automatically generated after a bin is scanned
- Each order is organized by vendor, contact information.
- The PO number is created with the date, and number of orders.
- Prices, and assigned vendor for each part was determined from historical data

Inventory Control Model

- Reorder point
- Safety Stock Levels

Scanning Software Features

- Scan: Allows unlimited amount of barcodes to be scanned
- Transfer: Allows for purchase orders to automatically generate given what is scanned.
- Email: Creates a table of what is scanned, and automatically generates an email ready to send via Outlook

Bin Assignment and Verification by Volume

- Large Volume: 306 in²
- Medium Volume: 288 in²
- Small Volume: 144 in²

Volume of Cylinder Part x Order Size Recommended ≤ Bin Volume

Order Quantity = (((Sample Mean) + (Normal Distribution prediction) + (EOQ) + (Average Order per size per instance)) / 4)

Sample Mean = Average of the 24 months
Normal Distribution prediction = Norm.Inv(0.95, Sample Mean, Sample STD)
EOQ = SQRT([2*(Fixed Cost)(Annual Demand)] / holding costs)
Average Order per size per instance = (Total Ordered / Instances)

Operations and Implementation

An operations manual detailing the system has been drafted for seamless hands-on, and implementation of the proposed system. Contents for the manual include: Introduction, Concept of Operations, Inventory List, Inventory Analysis, Two-KanBan Design, Storage Organization, Wireless Scanner, Ordering, Installing New Part, Setting up Email, Capturing Historical Data, Maintenance, Conclusions and References.
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System Criteria and Customer Priority

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Inventory Control Model

- Automated Excel Sheet
- Usages for shop parts
- Quantities to be ordered
- Reorder point
- Safety Stock Levels

Order Quantity = \( ((\text{Sample Mean}) + (\text{Normal Distribution prediction}) + (\text{EOQ}) + (\text{Average Order per size per instance})) / 4 \)

Sample Mean = Average of the 24 months
Normal Distribution prediction = Norm.Inv(0.95, Sample Mean, Sample STD)
EOQ = \( \sqrt{\frac{2(\text{Fixed Cost})(\text{Annual Demand})}{\text{holding costs}}} \)
Average Order per size per instance = (Total Ordered / Instances)

Ordering Process

- Purchase orders are automatically generated after a bin is scanned
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Scanning Software Features

- **Scan**
  - Allows unlimited amount of barcodes to be scanned
  - Allows for purchase orders to automatically generate given what is scanned.

- **Transfer**
  - Creates a table of what is scanned, and automatically generates an email ready to send via Outlook

- **Email**
Bin Assignment and Verification by Volume

- The demand at which the individual items are used and part size will determine how many of the items are placed in the bins.
- Assume all parts are cylinder in shape to calculate the volume.

Operations and Implementation

An operations manual detailing the system has been drafted for seamless hand-over, and implementation of the proposed system. Contents for the manual include: Introduction, Concept of Operations, Inventory List, Inventory Analysis, Two-Kan-Ban Design, Storage Organization, Wireless Scanner, Ordering, Installing New Part, Setting up Email, Capturing Historical Data, Maintenance, Conclusions and References.