California Auto Dismantling Inc. Inventory Management System

OMIS 372 – Prof. Feinstein December 2, 2009 Systems Analysis and Design Team: Chaitali Gohel Kunal Pathak Prashant Jagasia Reshad Noorzay

Executive Summary

The system analyzed in this report is a inventory management system. This system receives inputs from an employee based on the purchase or sale of cars and parts. Further this system manages the parts associated with a dismantled car or the addition of parts to a car in order for the car to be sold. California Auto Dismantling Inc. (CAD) is in the automotive recycling business. The current software used to manage their inventory system is Powerlink, a powerful and robust application that allows a business to comprehensively manage their inventory process.

The problems experienced by our client, CAD with the current system includes an inaccurate inventory database, lack of proper storage of inventory items, lack of automated processes to update the inventory database and delayed response time to customer requests and part inquiries.

The Systems Analysis Team identified the following key objectives that the new and improved system must meet:

- Ensure that the inventory system reflects accurately the parts and cars physically present at CAD Inc. premises.
- Automate the current manual procedures of updating the inventory database
- Improve the time it takes to respond to a customer request or inquiry.

The Systems Analysis Team reviewed the current system and identified three feasible alternatives:

- 1. Keep current system and add more individuals to complete the manual process and emphasize the need to meet the above objectives.
- 2. Modify the current procedures to use the full potential of Powerlink Inventory Management software and increase automation.
- 3. Contract specialized staff to complete the inventory management process and provide services in maintaining, updating, and organizing the Powerlink inventory management system.

The Systems Analysis Team recommends alternative 2, because it offers the most realistic and timely solution for California Auto Dismantling Inc. A modification of their current process will help them automate their inventory management process and ensure that the Powerlink inventory database reflects accurately the inventory in the yard at any given time. This alternative provides the clearest strategy for meeting the objectives without a hefty increase in expenses for the company and without a drastic shift in current working patterns. (See screen shots of the Powerlink application in Appendix A)

Introduction

California Auto Dismantling Inc. (CAD) is an automotive recycling company that offers a wide range of services including sales of used cars, sales of salvage titled cars, repair services and sales of car parts. The company is located in Vallejo, CA near the Napa Valley wineries. Serving the greater San Francisco Bay Area since 1997, California Auto Dismantling specializes in Honda, Toyota, Acura, Lexus, and Saturn cars or parts. Purchases can be made by visiting the shop, over the phone and via their website. Delivery is a free service to the Bay Area customers and shipping is also available to customers nationwide. The organization consists of two owners who act as managers, two supervisors assisting in daily office operations and 8 to 10 mechanics working outside the office in the yard and garage.

The company purchases cars from various sources such as auctions, other automotive recycling businesses and private owners. After the car is purchased, it is reviewed by the management team and a decision is made whether to sell the car or dismantle the car for parts. This decision is based on the quality of the car when purchased, the cost of fixing any damage, the cost of replacing missing parts, and the market value of the car. If a car will be resold then there is a manual process required to determine if additional parts are needed to upgrade or complete the car. There is a lack of proper inventory tracking to tag what additional parts are added to this car and what the total cost to the company is for upgrading the car. The car is then sold as-is and delivered to the customer. If the car is determined to be unfit for resale then a checklist is created based on the cars make, model and year. This is a list of parts that should be available for this car and often it is not possible to track every single part associated with that car. The procedure to check the main parts of the car against the list is a manual one and often times the inventory system is not updated to reflect the new parts. The car is then placed in the yard until a request for a specific part is made, which then leads to the dismantling procedure. The general lack of skilled staff to maintain the inventory system provides a challenge for CAD management. It results in an unreliable inventory database and a time consuming and troublesome process of manual searches for customer requests. Without an automated inventory management process that accurately accounts for all inventory owned by the company CAD continues to lose potential customers and remains a small scale automotive dismantling business.

Problem Description

The problem identified by our client, California Auto Dismantling Inc. is "The inventory management process requires too much manual work and the inventory system is inaccurate, which results in a delayed response time to customer requests."

Some of the problems experienced by our client are as follows:

Inventory System Accuracy -

As seen above the inventory system is not updated and checked properly. Therefore the integrity of the inventory system is not maintained and the accuracy of the system is impacted heavily. Often the inventory system will show parts that are no longer present at the yard and have been previously sold. Other times many parts that are currently in the yard are not reflected in the system and therefore the system is often the last place the staff will refer to when searching for a part.

Manual process updates -

When a car is purchased and arrives at the yard there is a checklist of parts generated and reviewed by staff. This process is completely manual and does not always result in an inventory database update. Further no sufficient data is maintained about parts in the car that are too small to be tracked. Parts that are used to upgrade a car for resale are not properly tracked in the inventory system. Parts that are sold via the website are not reviewed by the staff to ensure the inventory system is properly updated. With a highly manual process required each time updates are made to the inventory system often those updates are neglected due to time constraints.

Response time to customer request -

When a customer requests a part or inquiries about the availability of that part the employees are not all aware of the entire inventory of CAD Inc. Often times the first search through the inventory database does not yield accurate results. After that staff are required to rely on the memory of the managers to determine whether a part is available or not. Further customers are required to wait while a staff member searches the yard to determine if the inventory database or managers memory is accurate. Other times a customer's inquiry is left for days because staff is busy with requests for parts that are available and need to be processed.

Problem Statement defined by the Systems Analysis Team:

Inventory management process is not accurate and takes too much time.

Objectives

1. Inventory System Accuracy -

All items physically entering or leaving the CAD Inc. company must be tracked in the Powerlink Inventory Management application. Newly purchased cars must be processed and entered into the system within 1 hour of arrival. All parts or cars sold must be updated in the inventory management system within 30 to 45 minutes of the sale being complete.

2. Process Updates -

Manual processes that should be part of the Powerlink inventory management automated system should be converted to automatic processes. All changes to the current internal processes and procedures documentation must be updated before the implementation of the new system. Any necessary training on the new system must be completed before the time of implementation.

3. Timeliness -

A customer request/ inquiry should be processed and responded to within 5 to 10 minutes. Depending on the distance required and method of delivery, the delivery of a part should be complete within the same business day or 4 to 6 hours. Processing includes pulling the customer information from the system and documenting their request in the system. The response includes the generation and delivery of an invoice.

Scope

In order to achieve the objectives in the shortest time possible and without a heavy impact on the current working patterns, the new Inventory Management System can be implemented within 3 to 6 weeks. The items not include in the scope of this system are the following: purchase of cars from the auction or other venue, accounting system or process, delivery/ shipping process, and physical dismantling procedures or process.

Feasibility Study

In order to determine if a feasible solution to the problem exists, we looked at three major areas of note. Is the technology available to support the required changes? Is there an adequate staff skill level to implement the new system? Is the solution acceptable to the organization?

The inventory management problem is not unique to CAD, but must be addressed by all companies that are in the automotive recycling business. The technology used by these companies to solve this problem includes everything from manual processes used at CAD to highly automated systems on computer networks such as Powerlink. Therefore the choice of technology is up to each company and is not a limitation for this problem. CAD already owns this software and utilizes it in a fragmented manner.

California Auto Dismantling Inc. is a growing company accustomed complex automotive mechanics challenges and its staff are experts in the field of automotive mechanics. Its management team is keen about leveraging technology that is easy to use for less experienced staff as well as hiring new staff with a higher technology skill level. As a result, CAD has the staff skill level to leverage a new system and is prepared to train its current staff to benefit from the new system.

California Auto Dismantling Inc. is a successful company in a competitive and struggling economy. The company culture is open to innovative ideas that will improve their ability to succeed as an automotive recycling business. The management team has invested heavily in their Powerlink Inventory Management software and wants to ensure that their getting a return on that investment. The team realizes the need for an accurate inventory management system and is ready to take the steps necessary to meet those needs and achieve their goals. The company is continuing to grow and realizes that a solution to the inventory management problem will help them continue to expand and remain a profitable business.

Alternative solutions:

Considering the fact that CAD has been operating successfully for over a decade indicates that there should be a relatively simple solution to the problems identified. A simple alternative would be to keep the current system and add more staff to complete the manual processes. The current system requires manual documentation of order requests, car part checklists, sales tracking and delivery tracking. With a few more staff to spend time taking requests, searching manually for parts in the yard and delivering parts the company will be able to increase its customer request response time. Further these additional staff will be able to spend time updating the inventory system at a basic level. This will solve the problems identified over a longer time period and cost CAD Inc. additional salaries and wages.

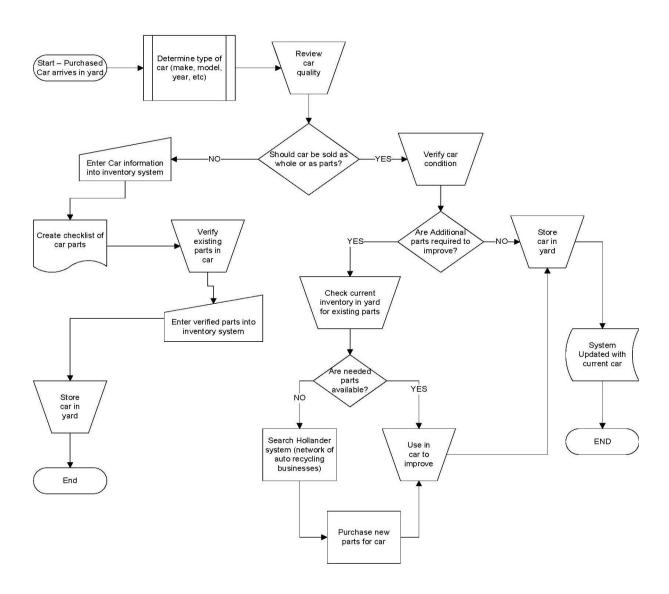
A second alternative would be to modify the current procedures to leverage the full potential of the Powerlink Inventory Management software and increase automation. The current system uses the Hollander network, which connects California Auto Dismantling Inc. with all the auto shops in the area. The inventory management system, Powerlink, provides many of the essential tools needed to process customer requests, search for and find parts in the inventory database, tag inventory items with a bar code, generate invoices for sales, and track delivery. If the current manual processes are fully automated the company will have an updated and accurate inventory database and also be able to address customer requests in a more timely fashion. This transition to the extensive use of the Powerlink system will require some training for staff and can be completed within a relatively shorter time frame with respect to alternative one.

A third alternative would be to contract a specialized external team that would spend time updating the inventory database. This would require no extra training for the CAD staff and would allow them to leverage more accurate inventory information to respond to customers and provide parts and cars faster. This solution would cost more than alternative one or two. However, it could potentially be implemented much sooner than either alternative one or two.

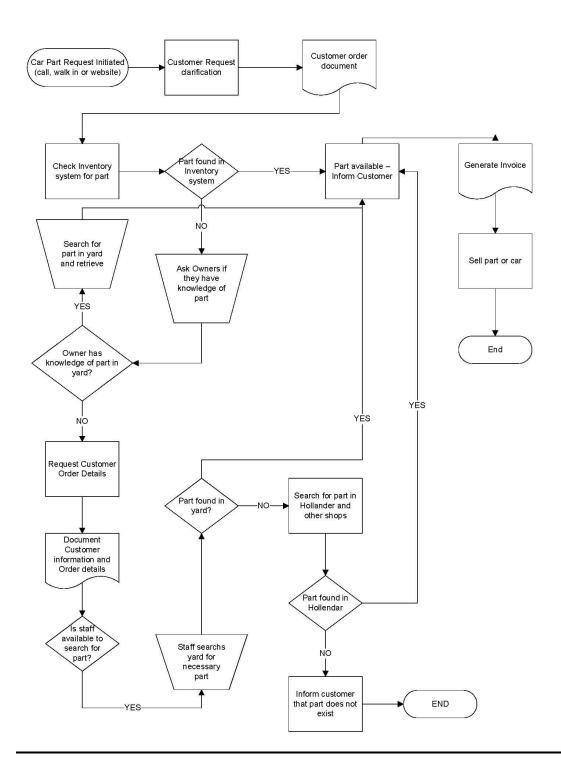
Analysis of Current System

Please refer to the following flow charts titled CAD - Current System Flow Chart - Inventory Management Process and CAD - Current System Flow Chart - Customer Request Process.

CAD – Current System Flow Chart Inventory Management Process



CAD – Current System Flow Chart Customer Request Process



Physical Model - System Flow Chart Description

The current Inventory Management Process begins with a car purchased from an auction or other venue. After the car is purchased the details regarding the make, model and year of the car are provided to staff at the office. The management team then manually reviews the quality of the car and makes a decision to either sell the car as-is or to use the car for parts. The decision is based on the amount of work needed to upgrade or improve the car and the market value of the car. If the car will be sold then the there is another manual evaluation of the parts required to improve or update the car. If additional parts are required then the staff determines if those parts are available at the CAD location or if parts must be purchased from outside vendors in order to complete the car for resale. The parts needed are purchased and the new parts are added. There is no tracking of what parts are added to the car and what parts are purchased. When the car is ready to be sold it is a stored and available for a customer to make an offer. The system, at this point, is sometimes updated with the new car information and at other times the car already has an offer on it so it is sold immediately.

If the car will be used for parts then there is a checklist generated and printed out for staff to review the parts available. This checklist is based on the type and model of car and the checklist contains an exhaustive amount of detail regarding the parts that the car should contain. A staff member must manually review the car to determine which parts are in good condition and can be sold and which parts are not available to be sold. Often times there are too many parts to be tracked and many other parts are too small to be tracked. If time permits a staff member will add the new parts into the inventory management system. The car is left intact and stored in the yard until customer requests are made.

The second main process in the current system is when a customer requests a part for purchase or inquires about the availability of that part. The two most prevalent forms of customer interaction are via telephone calls or in-person at the office. When a customer provides some general information regarding the part the staff often check the inventory system for parts initially. Yet due to an overall mistrust and known lack of accuracy of the inventory system, often the staff skip searching the inventory system altogether. However, if the part is found in the inventory system then the customer is informed of availability and is given a quote on the spot. Often times other staff members are delegated the task of seeking out the location of that part in the yard to confirm that the system is accurate. In cases where the system does not have updated information regarding the parts then the owners of the company are asked if they are aware of the specific part being available.

If the owners have knowledge of the part then the customer is given a quote for purchase and if they choose to purchase then the part is manually retrieved from the yard. If the owners are not aware of the part being available then the customer is asked to provide details regarding their request. Those details are documented on a sheet of paper. If time permits a staff member will be sent to search through the yard for the part. If the staff is busy then the request remains on file until a later time when staff is free. When the staff has the opportunity to search for the part in the yard they either will find that part or not be able to find that part. If they do find the part then the customer is notified of the availability and given a quote. The customer can then purchase the part and the process ends. If the part is not found in the CAD yard then the Hollander system is

search to determine if the part is available at any other auto recycling company. If this information is available then the customer is notified to contact that particular auto recycling company for the part needed. Lastly if a part is not found at any of these levels the customer is notified that CAD cannot provide them with the necessary request.

Often times, CAD Inc. deal mainly with customer requests that they are able to fulfill within a short time frame (approximately 15-30 minutes). The full process of searching and delving into the archives of the inventory is time consuming and tedious, which results in a lack of motivation and is determined to not be worth the investment. There are enough requests that can be completed in the shorter time frame resulting in the sales and delivery of parts.

<u>Logical Model - Data Flow Diagram Narrative</u>

The context diagram for the CAD system indicates the major sources and sinks in the system: Sources:

• Manager: Who purchases an item or car for CAD.

• Clients: Request for an item or car.

Sinks:

• Clients: The sales are made directly to the clients requesting the item.

The context diagram has two data inputs, the details of the item/car purchased by the managers and the item request made by the clients and one output – the details of the item requested by the client. The details of the processes are explained in the blow up Level 0 and 1 diagrams.

Level - 0 Data Flow Diagram

The Level 0 of the DFD gives an overview of the high level processes of the system. We have two major processes viz. Review Car and Inventory Management. The inputs to this level are the details of a car and an item request made by client. The output obtained is the information on the item (location in the yard, number of units available, etc). The sink of this information is the staff employee who makes the input the system and the source is again a staff employee who feeds the details of the car into the system.

1.0 Review Car:

The car review process takes the car details as the input. The car is checked for quality and parts present on it. By this we can get the information whether the car should be sold as an entire unit or should it be dismantled for getting salvage value out of the parts. If the car is to be dismantled a checklist of the parts to be dismantled is generated else a list of missing parts is generated that could be used to prepare the car for sale as an entire unit.

2.0 Dismantling Process: (Out of project scope)

In this process the car is dismantled and the details of the dismantled parts are passed to the inventory management process for system update. The input to this process is reusable car parts.

3.0 Betterment of the car:

In this process we have checklist of missing parts as input, these missing parts are searched in the system for its availability. Then if the parts are available they are retrieved from the inventory available and the car is fixed. (Otherwise these parts are obtained from the other yards, this is out of the scope of this project). The output of this process is information for inventory update of the parts used for the betterment of the car.

4.0 Inventory Management

In this process an item (entire car unit/dismantled parts) is uniquely identified and stored in the yard/warehouse. The information on storage of the item and the identity of the item is updated into the system. The item retrieval process is also taken care of by the inventory management. The inputs are inventory/part details and the client request/order. The output of this process is item information.

Level 1 Data Flow Diagram -

Car Review 1.0

1.1 Generate Item Checklist:

In this process the complete review of the items available on the car is performed and a checklist of parts available on the car is generated. It takes the car details as input and passes a checklist as input data to the next process which is validation of item quality.

1.2 Validate item Quality:

In this process the data from the item checklist generated in the previous process is validated for its quality. It is in this process that a decision is taken whether the car would be prepared for sale as an entire unit or would be dismantled to salvage individual parts. If the car has to be dismantled a list of reusable parts is generated as a output. Else if the car has to be sold as a complete unit a list of parts missing on the car is generated.

Betterment of the Car 3.0

3.1 Check if the inventory is available in system:

For the betterment process we first check if the parts needed for the betterment are available in inventory. We have checklist of the missing parts as input to this process and the availability of the part as output. This process determines if the parts are available in system. If the part is not available then it is searched in Hollander system.

3.2 Retrieval of missing parts:

If the part is available in the system then this process retrieves the part from the warehouse. The input to this process is the information that the part is available and the output is the retrieved part.

3.3 Fix the car:

Once the missing part is retrieved, the car is sent for betterment. In this process the missing parts are fixed in the car and the car is made available for sale. The inventory is updated with the used

parts and new item available for sales information is passed to the inventory management process.

Inventory Management 4.0

4.1 Designate UID:

In this process a unique identification number is generated for each item. The unique identification number contains the item information that can be utilized for storage and retrieval of this item. This number is bar coded and tagged on to the item. The input to this process is item information and the output of this process is UID details of the part.

4.2Storing:

This process handles the storing of the item. If the item is a dismantled car part then storage information contains information like the rack and the shelf from where the item can be retrieved else the storage information is the location of the car unit in the yard. This process takes uniquely identified part details as input and generates item storage information as output.

4.3 System update:

System update process takes input from storing process and retrieval process the functionality of this process is to maintain the accuracy of item information. The output of this process is the information regarding the location and number of units of available items.

4.4 Retrieval:

This process takes client request as input from the staff employee whenever an item is fetched this process generates the transaction details as output which is given to system update to maintain inventory accuracy.

Appendix A – Powerlink Software Screen Shots

