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| Parts and Service System  *An analysis by Revivify* | | | |
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# Executive Summary

The attached report provides the analysis of the current Parts and Service System in place at Maple Leaf Nissan done by Revivify. It examines any current problems that are caused by the various events happening within the dealership such as customer purchases and customer work orders. It is to provide an overview of our understanding of the aforementioned system, as well as our views on potential areas for improvement.

Our research reveals that the current system in place causes various issues with tracking what is on hand for inventory and what happens to said inventory on a day to day basis. In most instances the issue appears to be with the lack of fluidity within the system and how things are updated or processed. With some of these issues it leads to untracked inventory updates and changes within the inventory that are never acknowledged until late in the year during audits.

Further investigation shows that there is little customer friendly process for ordering parts and keeping track of how work is completed on vehicles. In instances with parts specially ordered for customers sometimes a part could be sold before the person who asked for it ever finds out, leading to frustration on the customers end as they, in most cases, had to pay a deposit for the order. As well as issues with ease of access in the backend of the system to find who may have repaired a vehicle or what was done for said repair. There is no method in place to track or acknowledge any customer complaints.

Moreover, communication between some important sections of the dealership is entirely paper/phone based and can lead to missing documentation or incorrect data being passed back and forth. This leads to further issues with tracking of warranty and other types of work completed for customers. Electronic data use would potentially improve tracking and handling of various types of data and could be of significant use to the dealership.

Our goal in this is to further the success of the Maple Leaf Nissan dealership by implementing a system in which could improve the process within the company. An investment in this endeavor can minimize errors in the inventory and assist with better tracking of work orders and the passing of information between employees. We look forward to working with you in the near future to increase the effectiveness of the Parts and Service System.

Contents

[Executive Summary 1](#_Toc369036713)

[Analysis 4](#_Toc369036714)

[Parts and Inventory System 4](#_Toc369036715)

[Detailed Process 4](#_Toc369036716)

[Activity Diagram 6](#_Toc369036717)

[Use Case Diagram 7](#_Toc369036718)

[Creating Order Lists & Purchase Orders 8](#_Toc369036719)

[Detailed Processes 8](#_Toc369036720)

[Activity Diagram 9](#_Toc369036721)

[Use Case Diagram 10](#_Toc369036722)

[Order Arrivals 11](#_Toc369036723)

[Written Process 11](#_Toc369036724)

[Activity Diagram 12](#_Toc369036725)

[Use Case Diagram 13](#_Toc369036726)

[Customer Special Order 14](#_Toc369036727)

[Written Process 14](#_Toc369036728)

[Activity Diagram 15](#_Toc369036729)

[Use Case Diagram 16](#_Toc369036730)

[Part Return 17](#_Toc369036731)

[Written Process 17](#_Toc369036732)

[Activity Diagram 18](#_Toc369036733)

[Work Order/Service 19](#_Toc369036735)

[Written Process (Creating Record and Work Order) 19](#_Toc369036736)

[Activity Diagram (Creating Record and Work Order) 20](#_Toc369036737)

[Written Process (Assigning Work Order) 22](#_Toc369036738)

[Activity Diagram (Assigning Work Order) 23](#_Toc369036739)

[Use Case Diagram (Assigning Work Order) 24](#_Toc369036740)

[Written Process (Finalizing Work Order) 24](#_Toc369036741)

[Activity Diagram (Finalizing Work Order) 25](#_Toc369036742)

[Service System - Use Case 26](#_Toc369036743)

[Creating Purchase Order Number 27](#_Toc369036745)

[Written Process 27](#_Toc369036746)

[Activity Diagram 28](#_Toc369036747)

[Use Case Diagram 29](#_Toc369036748)

[Compiling Customer Invoices 30](#_Toc369036749)

[Written Process 30](#_Toc369036750)

[Activity Diagram 31](#_Toc369036751)

[Use Case Diagram 32](#_Toc369036752)

[Shrinkage 33](#_Toc369036753)

[Written Process 33](#_Toc369036754)

[Ordering Part from Reorder if Parts are on Back Order 34](#_Toc369036755)

[Current Website 35](#_Toc369036756)

[AllData and the FAST System 36](#_Toc369036757)

# Analysis

## Parts and Inventory System

### Detailed Process

#### Assumptions

* All invoices created from selling parts are eventually sent to accounts receivable
* Customer always pays if billable
* Parts found in FAST system will be found in the Parts & Inventory System
* Company accounts on diagram are not overdue

#### Process

1. The parts and inventory system process begins when a customer requests a part from the Parts Associate.
2. The part name or part number is given to the Parts Associate who will then looks up the part in the FAST System.
3. When the part is found in the FAST system, the Parts Associate can optionally print out a sheet of information with the part number.
4. The Parts Associate would then look the part up in the parts and inventory system
5. From here, it depends if the customer is internal (Service Technician) or external.
6. **Service Technician**
   1. The Parts Associate would check to see if the Service Technician has a work order (given to the technician by the Service Writer). Without a work order the Parts Associate cannot give the part to the Technician
   2. If the Service Technician has a work order and the part is available, the Parts Associate writes the part information on the work order. Then the part is given to the Service Technician to use in a service job. (See service system process on how this updates the inventory).
   3. If the Service Technician has a work order and the part is not available, the Parts Associate would ask if the Service Technician would like to add the part to the Order List. The Service Technician may choose to obtain the part elsewhere, or he may choose to add it to the order list.
   4. If the Service Technician chooses to add it to the order list, he/she would then return the work order to the Service Writer. The Service Writer would put the work order aside and note the part on the work order, and contact the Parts Associate at a later time to see if the part is available. (See the Service System Process for further details).
7. **External Customer**
   1. If the part is not available, the customer would be asked if they would like to add the part to the order list (special order) and pay a deposit.
   2. The customer may choose no, and the customer would obtain the part elsewhere
   3. The customer could choose yes, pay the deposit, the payment is documented on paper, and the Parts Associate would add the part to the special order list.(See Order List/Purchase Order Process for further details)
   4. If the part is available, the Parts Associate would ask the customer for their information (Phone Number/Name) to see if they already have a customer record in the system
   5. If the customer does not have a customer record, they are asked for information to create a record, the customer may optionally choose not to give any information to simply purchase the part
   6. If the customer does not wish to have their customer record created, the customer would pay and the Parts Associate would create/print an invoice for the customer (which in turn updates the Inventory in the system) and the customer would be given the part.
   7. If the customer wishes to have a customer record, it is created by the Parts Associate.
   8. In the case that the customer has a record, the Parts Associate would verify if the customer has a Company Account. If the customer does have a company account, the Parts Associate would print the invoice and give a copy to the customer (which in turn updates the Inventory in the system), and the customer is given the part. After this, an invoice is sent to Accounts Receivable.
   9. If the customer does not have a company account, the Parts Associate would also have to know if the part was Billable or Non-Billable.
   10. If the part was covered under warranty, the Parts Associate would create an invoice for the customer (which in turn updates the Inventory in the system), the invoice and part are given to the customer. An invoice is also then sent to Accounts Receivable.
   11. If there was no company account, and it is client billable the Parts Associate would apply any discounts that the customer is eligible for (note: the customer may not receive any discount), the customer would pay and the Parts Associate would complete and print the invoice (which in turn updates the inventory in the system) and it would be given to the customer along with their part.

#### Problems

1. Parts Associate writes part number on work order, inventory is not updated until service is performed and Service Writer finalizes invoice.
2. If Parts Associate is too busy with the Service Technicians, he may ask one of the Service Technicians to write the part number on the work order. In some cases, the Service Technician may forget to write the part down. In this case, the part is given away for free, and the inventory is off by 1.
3. Special orders are kept on paper, and not always checked when going through new orders.
4. Customer numbers are not the same between the Parts & Inventory System and the Service Work Order system.

### Activity Diagram



### Use Case Diagram



## Creating Order Lists & Purchase Orders

### Detailed Processes

#### Assumptions

* A part is needed, a part must be ordered (to begin the diagram)
* A Parts Associate may choose to wait for a reorder coming in to satisfy a back order
* If a Parts Associate choose to wait for the reorder to come in to fill the back order, he will stop trying to make the order

#### Process

1. Order lists are created in the system generally by Parts Associates
2. The Parts Associate would enter any parts needed to the Order List
3. The Parts Associate may or may not be aware of other orders that have already been made
   1. Due to no list in the system of previous orders(other than purchase order), there are times where the Parts Associate may be unaware of orders that have already been placed
   2. In some cases this can cause either parts to be ordered twice
4. If an order was already made, and the Parts Associate checks and a reorder contains the part needed, the Part Associate has the option to wait for that order to come in.
5. After the needed part(s) are added to the Order List, the Parts Associate can optionally choose to check the flagged reorders
6. The Parts Associate may also adjust the amounts for the reorder
7. If a reorder is attached to an order, the flag still remains in the system until the inventory reaches the set reorder level.
   1. If the Parts Associate is unaware of previous orders made and reorders were already attached to another order, it is possible now for a reorder to be doubled.
8. When the Order List is completed, the Parts & Service Manager contacts the Business manager with the total for the order. The Parts & Service Manager requests a Purchase Order Number from the Business Manager. The Purchase Order is given over the phone.
9. The Order List is now updated with the Purchase Number, and the Purchase Order is created
10. The Purchase Order is then faxed over to the Warehouse chosen(In most cases, the Regional Warehouse)

#### Problems

1. Order history not easily accessible. Ex: Hard to check what parts and reorders have already been ordered. This can cause a part to be ordered when another is already coming in.
2. Inventory system does not remove flag from reorder even after reordered made, only when inventory is updated
3. Reorders can be duplicated
4. Parts that are commonly ordered are not tracked. Ex: If spark plugs are needed to be reordered multiple times per week, more shipments are needed. This could affect sales loss as well, if part is quite often out of stock, and customer does not want to wait for reorder.

### Activity Diagram

### Use Case Diagram



## Order Arrivals

### Written Process

#### Assumptions

* Customer was charged a deposit while special order was placed

#### Process

1. The process begins when Maple Leaf Nissan receives an order (shipment arrives)
2. The contents of the box are then verified against the packing slip to see if everything matches.

If they don’t match or something is broken on arrival the issue is resolved by parts manager

1. If the parts matches packing slip, the Parts Associate then brings up the order in the system
2. Parts Associate then checks to see if a part was on backorder
   1. If all parts arrives and nothing was on back order
      1. He then selects received in the system.
      2. The inventory gets updated at this point and the order is marked as complete
   2. If a part was on backorder
      1. Parts Associate then adjusts the purchase order in the system to account for packing slip
      2. He the selects received in the system
      3. The inventory then gets updated but the order remains as outstanding in the system
3. **For special orders**
   1. The Parts Associate may check if there was any special order with the current order.
   2. If there were no special order, the new stock gets added to the physical inventory
   3. If the Parts Associate discovers a part was a special order, he might set the part aside
      1. If the part wasn’t set aside, customer special order gets added with the regular inventory and may be sold to another customer looking for the same part
   4. If he sets the customer part aside, it is kept ready for customer pick up
   5. He may contact the customer to inform part arrival
   6. When the customer comes in to pick up the ordered part and pays for the part either using cash or on account depending on the type of customer
   7. The Parts Associate then prints an invoice and the inventory system gets updated at that point
   8. Customer is then given his special order part and the transaction is complete
   9. If the customer fails to show up to pick his special order part, the part gets put back in with the physical inventory
   10. After a prolonged period, the customer may even loose the deposit, if it was paid while ordering the special order

### Activity Diagram

### Use Case Diagram



## Customer Special Order

### Written Process

#### Assumptions

* There is a special order
* Deposit has been paid for the special order

#### Process

1. A customer arrives at the parts desk ready to purchase a part that they have special ordered.
   1. The customer may have been called in and advised that their order has arrived. In this case the part has probably been set aside for them.
2. If the customer has not been called in to pick up the part the customer may just be checking in on the status or was advised to come in after so many days.
   1. The parts associate will verify the customers’ name and order. They will also check to see if the part was set aside for the customer.
   2. In the case that there is no part set aside the Parts Associate will check within the inventory system to verify if the part has been put into the system.
      1. Sometimes the part may not be in the physical inventory so the Parts Associate will have to check the packing slips from the orders that have arrived for the day for the customers’ part.
      2. Alternatively as well the part can say that it is in the inventory but not be physically in inventory.
   3. The part may not have been received yet and the customer will probably have to check in again later or wait for a call to come back in.
3. If the part has been retrieved for the customer then a customer invoice is generated and the customer will pay the remainder of their order.
   1. In cases where the part has not been located, may have been sold already, may have been used in repairs or may just not have arrived yet the customer can be refunded the deposit they paid.

#### Problems

1. Customers are not always advised of when their part is available.
2. Parts can be sold before the person who orders them ever finds out.
3. In cases where the part is sold and the customer comes in at some point later the sale of their part may not have been tracked and they may be advised to wait for a part that will never arrive
4. Parts are not always set aside for someone.

### Activity Diagram



### Use Case Diagram



### Part Return

### Written Process

#### Assumptions

* The returned part gets prioritized for work orders
* There may be times when customer may have bought a part based on Parts Associates advice and the part wasn’t what the customer was looking for. In which case customer can still get a refund but depending on the condition of the part, the part may not be reusable

#### Process

1. The process begins when customer brings back a part
2. The Parts Associate then looks up purchase history in the system
3. He then investigates the part
4. If the part is non-refundable, Parts Associate refuses the part return
5. If the part is refundable, the customer is given his money back
6. After the part is taken back, the Parts Associate then determines if the part can be added back to the inventory
7. If not, the part is not considered shrinkage
8. If the part is in good condition and the box is still undamaged the part gets added to the inventory along with other parts
9. If the part is in good condition, but the box was damaged or missing, the part is added to the inventory
10. The part information is also updated in the inventory system
11. The returned part information is then sent to accounting
12. The unboxed part is ideally prioritized for work orders
13. If a customer came in looking for part and newer parts were not available, Parts Associate might then offer the customer the returned part, at which point the customer might offer to buy the part at a discounted price

### Activity Diagram

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## Work Order/Service

### Written Process (Creating Record and Work Order)

#### Assumptions

* Assuming the process of avoiding duplication of customer information in the service system already exists

#### Process

1. The service process begins when a customer brings in a car for servicing.
2. The Service Writer then looks up information either based on customer information or car information
3. If customer doesn’t exist, he then looks up the car information,
   1. If the car exists in the system, he creates a new customer record and adds the previous car servicing information to the new customer.
4. If car doesn’t exist in the system, but the customer has had servicing done before
   1. He adds new car information to the customer in the system
5. After the customer and car information are added into the system
6. The customer then explains issues with the car
7. Service Writer then starts a work order based on the issues identified
   1. Service Writer looks up ALLDATA system for standard procedures and adds it to the work order
   2. If the issues mentioned are not standard, they are considered non-standard procedures and are billed by the hour
8. The work order is then created in the system and printed out by the Service Writer
9. Customer then signs off on the work order and then gives it back Service Writer

### Activity Diagram (Creating Record and Work Order)

Use Case Diagram (Creating Record and Work Order)

### Written Process (Assigning Work Order)

#### Assumptions

* Parts Associate is aware of any returned part that is in the inventory and assigns that to the work order prior assigning a new in-the-box part

#### Process

1. The process begins when Service Writer assigns work order to Service Tech
2. Service Tech then gets to working on the car based on the work order
   1. If the work order contains standard procures, he fixes them accordingly
   2. If the work order contains non-standard procures, the Service Writer will do a diagnostic to determine what the issue is
3. Service Tech informs the Service Writer about the non-standard issues
4. Before the Service Tech gets to working on the non-standard issues, the Service Writer contacts the customer to inform them of the findings and the potential cost of the non-standard procedure.
   1. If the customer agrees to have the non-standard issues, the new work gets added to the work order
   2. If the customer does not wish to get the new work done, the Service Tech will work on any other issues that may have been listed on the work order
5. During the process of working on the work order, the Service Tech may discover new issues
   1. If the issue is a major fix, Service Tech advises Service Writer and the Service Writer contacts the customer to find out if the customer would like to get that fixed as well
   2. If Service Tech discovers a minor issue, he fixes the issue and adds the work to the work order
6. When the Service Tech requires a new part
   1. Service Tech takes the work order to Parts Associate and requests the part needed
   2. Parts Associate will then look up in the inventory system to figure out if they have the part
   3. If the part is in stock
      1. The Parts Associate then marks the part number on the work order
      2. In case the Parts Associate is too busy to mark part number on the work order, the Service Tech is expected to account for the part on the work order
      3. The Service Tech the retrieves part from Part Associate and gets back to working on the car
   4. If the part is not in stock
      1. Service Tech requests Parts Associate to order the part
      2. Service Tech then returns the work order to the Service Writer and informs him that the work is on hold till the part arrives
      3. Service Writer then assigns a new task to the Service Tech
      4. At a later point in time, Service Writer calls up Parts Associate to find out about the part needed for the work order
      5. If the part for the work order is in stock
      6. Work is resumed on the work order and is assigned to a Service Tech
7. After work is complete, Service Tech returns the work order to Service Writer and work is completed on the car

### Activity Diagram (Assigning Work Order)



### Use Case Diagram (Assigning Work Order)

### Written Process (Finalizing Work Order)

#### Assumptions

* Company accounts and discounts are already predetermined and Service Writer will discount company accounts appropriately

#### Process

1. After the repairs are complete, Service Tech hands the work order to the Service Writer and the work order gets updated in the system
2. Service writer then determines if any work done on the car was Full warranty work or free service
   1. In which case, both parts and labor are appropriately charged
   2. If any newly installed part was replacing a recalled part charges are reflect accordingly on the invoice
3. After the Service Writer adds all the work in the system charges
4. The invoice is ready in the system
5. Service Writer then reaches out to the customer to inform that are car is ready to be picked up
6. When customer arrives to pick up car, Service Writer determines payment method
7. If the customer has a company account, they are able to pay on account, in that case the Invoice is sent to Accounts Receivable
8. After customer payment is handled the Service Writer prints off two copies of the invoice, a copy is handed to the customer and the customer gets his car back
9. All copies of invoices are sent to Accounting Department, where all information is entered into the Accounting System.

### Activity Diagram (Finalizing Work Order)



### Service System - Use Case

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## Creating Purchase Order Number

### Written Process

#### Assumptions

* Parts Manager has totals and the destination of the order request

#### Process

1. The Parts Manager will have prepared orders and is reaching out to the Business Manager to get a purchase order number.
   1. The information the Business Manager needs at this point is the total of the order and the supplier it is being sent to.
2. The Business Manager will create a purchase order number and provide it to the Parts Manager who will finish the order and fax the order to the supplier in question.
   1. Once the order is faxed out the Business Manager needs to know of this as well for when the order is completed.

#### Problems

1. There is a concern that everything needs to be done in phone calls.
2. Has to sometimes track down invoices as they do not always make it to the Business Manager.
3. Multiple orders being processed for same item, missing out on discounts for bulk orders.

### Activity Diagram



### Use Case Diagram



## Compiling Customer Invoices

### Written Process

#### Assumptions

#### Process

1. Every day the Accountant will begin to manually enter all of the necessary information from a collective of customer invoices. This is a pile of paper that the Account has to manually sort through.
   1. The important information on these documents is the totals for parts and labour and the invoice numbers.
   2. The other important information is how services or parts may have been paid for. This includes warranty, recall, discounts, or payments via cash, cheque, and credit or added on account.
2. The Accountant will add this information into the system towards the end of the day and if not completed will carry over into the next day in the morning. This is all manual data entry.
   1. Sometimes a customer invoice can be missing; in this case the Accountant will go and try to find the customer invoice by doing a general walkthrough.
   2. If the invoice is never found the Business Manager gets involved in finding it.
   3. As well sometimes the invoices can be handed in in rough shape, making things hard to read or interpret.

#### Problems

1. Customer invoices can be missing or illegible can lead to inaccurate data.
2. All the data entry is manual and time consuming. No electronic data.

### Activity Diagram



### Use Case Diagram



## Shrinkage

### Written Process

Shrinkage

1. Customer returns part that is defective (Possibly due to durability loss) warehouse will not take it back.
2. Customer returns a part that the customer broke, but is deemed returnable
   1. Ex: Customer given radiator to fit in car, radiator was given to customer and told this was the correct part. Part was actually for another vehicle, and would not fit properly in the customers’ vehicle. During the process of trying to get the part in, it caused damage to said part. Parts Associate deems this to be a mistake and refunds the customer.
3. Part broken during stocking process.
4. Part broken when a car was being serviced.
5. Part remains on shelf too long and durability is affected.
6. Part goes missing (unknown reason)
7. Part that is used to service a car is not written down on the work order, or the invoice. Part is never paid for, and inventory shows 1 extra part in the system.
8. Goodwill work due to customer complaint

Current procedures that can affect shrinkage and sales loss

1. Reorder process: The system does not currently keep a record if a reorder has already been made. Duplicate reorders can be made, causing overstock of certain parts.
2. Part does not decrease inventory when the Service Technician retrieves the part from the Parts Associate. Part is updated later (whenever the service is finished) and when the invoice is created by the service writer, then the inventory is updated. Potentially could cause loss of sale if a customer was told a part was available, came in and then was told it was not.
3. Part on back order for technician
   1. Service writer may forget to contact Parts Department to confirm if part is now available. This could potentially cause the delay of service for a customer, which could in turn cause the customer to be dissatisfied. Also, delaying this service could potentially tie up a service bay (possibly a service bay with wheel alignment abilities) that cause delays for all other customers as well.
4. Customer special order
   1. If customers special order is not set aside, and then the part is used/sold to someone else, there is a possibility that if the part is not available when the customer comes in that they choose to go elsewhere.

## Ordering Part from Reorder if Parts are on Back Order

The following fictions situation is used to explain how parts are added to the Order List based on Reorder Level calculations and how the system gets updated when a part is used from inventory

Inventory ideally likes to have 50 headlights on hand as they are a fast selling item

Reorder level for headlights may be assigned 25

Scenario I:

Inventory currently has 45 headlights on hand

3 headlights are already on backorder

Customer comes in and buys 20 headlights

Inventory now has 25 and need 25 more to have a full stock

Place order for 22 headlights for next order

Next order + back order =Inventory needed 25 in total to have full stock of 50

22 + 3 = 25

Scenario II:

Inventory currently has 15 headlights on hand

30 headlights are already on backorder

Customer comes in and buys 3 headlights

Inventory now has 12 and need 38 more

Place order for 8 headlights for next order

Next order + back order =Inventory needed 38 in total to have full stock of 50

8 + 30 =38

Calculation:

Based on the above scenarios, the calculation performed to determine how many parts needs to be ordered to have a full stock of certain item

Next order = Number of certain item usually present in the inventory

* The number of that item presently in stock
* Current number of back orders for that item

## Current Website

The website currently in place is reportedly out of date with information, such as the times Maple Leaf Nissan is open. The reason for this is primarily due to how the website is updated. Updates to the website are only done when a web designer in contracted to make changes for the company. This causes issues because the company has to pay and hire out of pocket as Nissan really only provides a link to their site on the main site but does not assist with general upkeep costs.

This website can be vital to furthering the success of Maple Leaf Nissan as it could give an online presence more so than it currently has. By reaching out to customers online or having more information readily available online it would only assist the company with streamlining how the current methods of repairs and services and selling of parts works.

This could be considered a problem as people who currently visit the site are not able to find any real information on what is stocked or cannot keep track of current progress on their vehicle. Updates to this site could massively help with customer service.

## AllData and the FAST System

The NISSAN FAST system is the current system in place to assist in searching part numbers for various parts of a Nissan vehicle. The system has the ability to show various parts by section for each of the cars available, as well as show what may have been affected based on the damage reported within the systems options. E-FAST is similar to the FAST portion of the application but it used for older models of vehicle.

For example a customer could come in for service and state they have minor damage to front left headlight. Someone using the fast system could easily determine what parts would need to be replaced. With this section of the application the Parts Associate could list all the part numbers and print this list for searching within the inventory system. There is no current integration between the two systems and they are not on the same PC.

The AllData system is used to determine work and costs for car repairs based on specific types of issues. The information in this system will generally be used to determine how long a repair should take and how much the repair will cost. This information is set information and the system does not need to be changed. It can be blended in with potential new updates as it is effective as is.