Developing A Business Case For WMS in the Automotive Component Supply Chain

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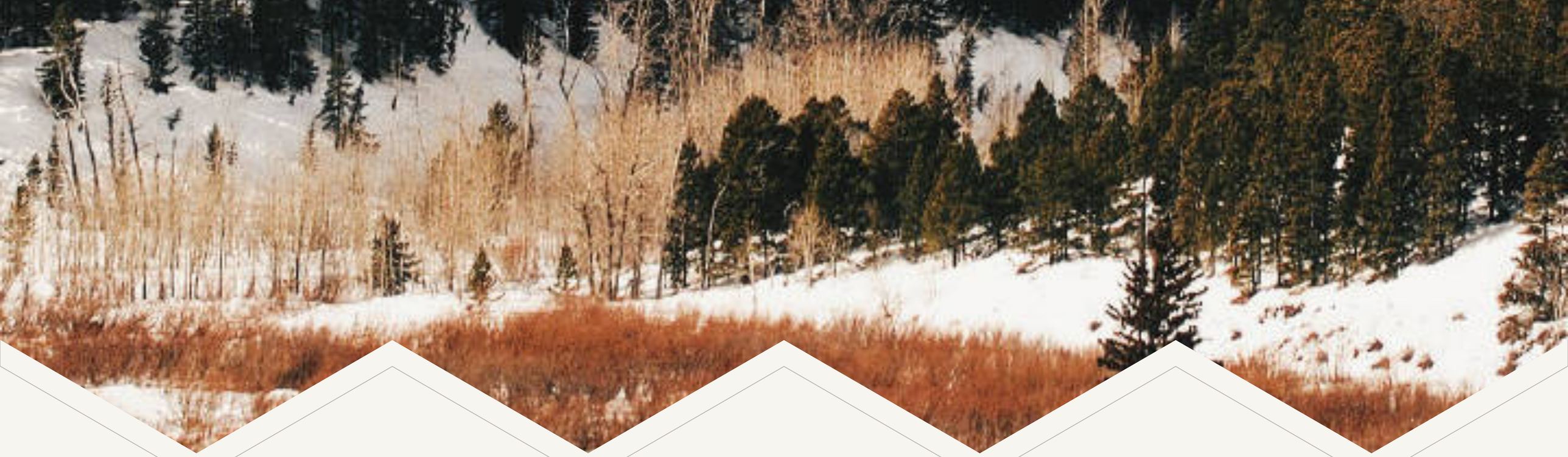
Introduction

- Development of the research - Company A
- Automotive component supply chain - upstream and downstream effects

- Focus on the operations of Company A
- Company A’s present status
- Company A’s plan for future

- Identification of problems
- Root causes



Purpose of Study

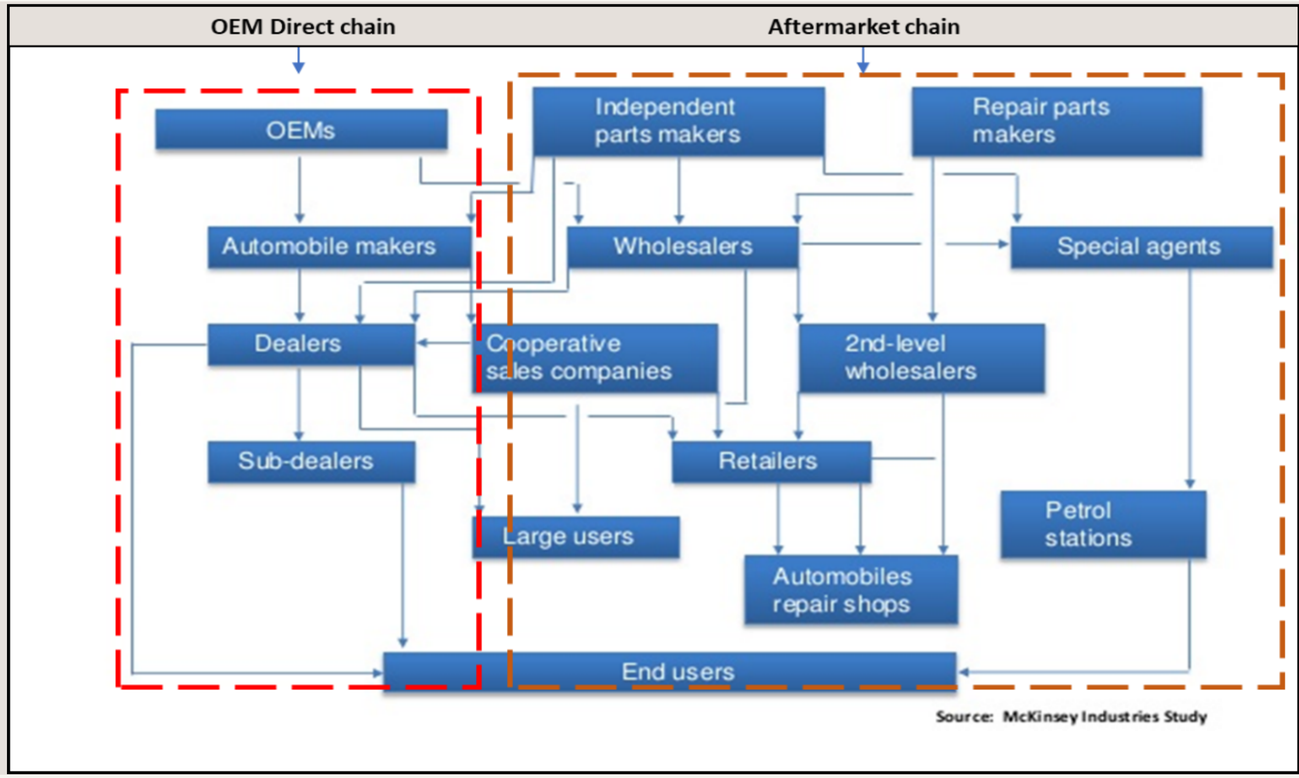
- Identify a technological intervention such as a Warehouse Management System (WMS).
- Through research and analysis will a Warehouse Management System be a viable solution for “Company A” to improve their overall efficiency?
- Focuses and why chosen:
  - Warehouse Space Utilization
  - Labor Utilization
  - Dock to Stock
  - Returned Goods

Background

Background

Automotive Component Supply Chain

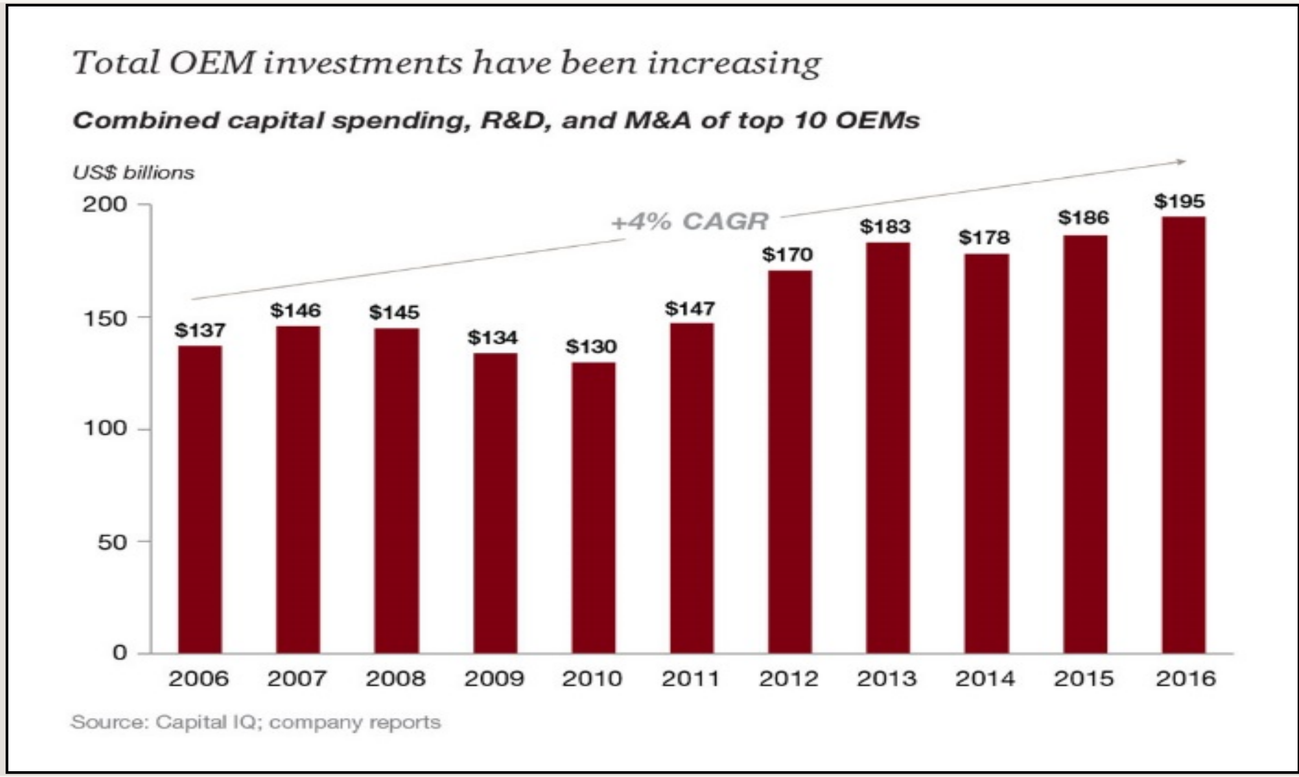
- In 2016, worldwide automotive sales reached 88 million, a 4.8% annual growth (Rich Parkin, 2017).
- This trickle down effect has a large impact on automotive component maker.
- Automotive makers are constantly engaged in innovation
  - Autonomous cars
  - Hybrid, Hydrogen cell and Electric fuel options
  - Internet of Things (IoT)
- Worldwide top automotive component manufacturers are Robert Bosch and Company A.
- Business models of automotive parts maker
  - OEM
  - Aftermarket



Background

OEM Market

- OEM - Organization who manufacture that piece of original product which goes into the assembly of a “new vehicle”
  - Design and technology may be proprietary
  - Satisfying material and methods of the customers
- Components directly sold to the company assembling the new vehicle.
- OEMs’ are beginning to invest, and a PwC research estimated that OEM investments had reached $195 billion by the year 2016.



Background

Aftermarket

- Aftermarket refers to supplying parts after the initial product is sold.
  - Retail environment - Auto Zone, ORailley etc.
  - Dealers - Accessories and fixtures
  - Other wholesalers and distribution network

- The aftermarket segment was the result of analysis of lost opportunity cost, OEMS were leaving behind on the table.

- A Harvard Business Review study estimated that, OEM lose most of the aftermarket potential after the initial warranty period (Cohen et al., 2006).

- In 2012, automotive aftermarket products represented $307.7 billion in sales.

- US automotive aftermarket is expected to grow at a compounded annual growth rate of 3.4% through 2017 (Automotive Aftermarket Suppliers Association, 2017).

Background

The “Company A” Vision

- A leading supplier of advance automotive technology system and component maker.
- Revenues of over $40.0 billion worldwide.
- Over 200 cutting edge automotive associate companies.

Background

Problem Statement

- Company A, is currently undergoing a transformation to enhance their internal systems with the goal of improving their overall process efficiency. One such consideration, is the processes within the warehouse.
- Presently, Company A adopts manual methods of obtaining and managing data for everyday day decision making. This has resulted in lack of visibility to make constructive changes for Company A. A change can be implemented through technological advancement which creates flexibility and identifies issues within the labor, space, inventory and time paradigm.

Research Questions

- Can a WMS help an automotive component supplier reduce the cost of return goods process by at least 25%?
- Will dock to stock time will be reduced by 5-10% as compared to the current working based on a non-WMS system?
- How can an automotive parts supplier improve the efficiency of labor utilization in the warehouse?
- How will a WMS effectively improve warehouse space utilization?

Background

Warehouse

Purpose of a warehouse

- A warehouse is a facility which enables (Rama et al., 2012)
  - Consolidation of products
  - Opportunity to reduce transportation cost
  - Achieve economies of scale
  - Create value-added processes
  - Shorten response time

- Warehousing has evolved to become a critical link in the modern supply chain, approximately 2-5% of total logistical costs can be attributed to warehousing (Frazelle, 2002).

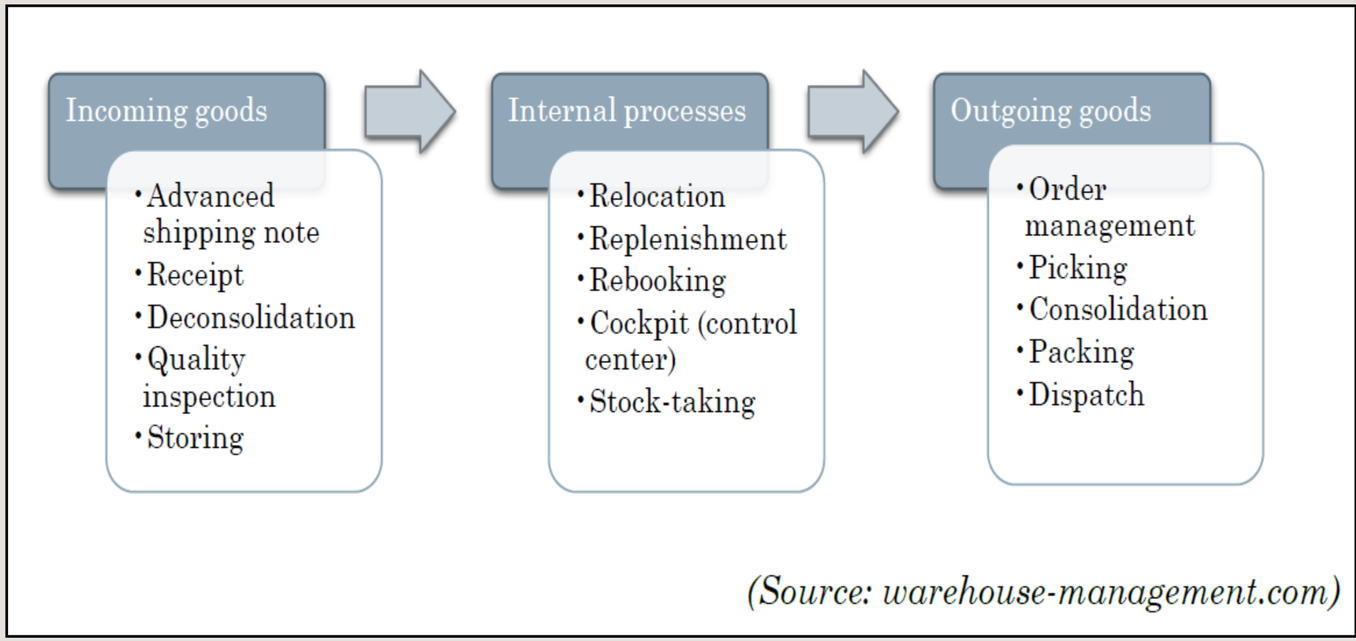
- **https://youtu.be/203Oo_hE37U**

Background

Warehouse Management System

Functions of a WMS

- Software and real-time based solutions for warehouses and distribution centers.
- A WMS has four critical functions
  - Define a warehouse structure
  - Master data management
  - Inventory management
  - Transportation management



(Source: warehouse-management.com)

Background

Warehouse Management System

Benefits of using a WMS

1. Transparency and Visibility
2. Better Balanced Inventory
3. Optimized Processes
4. Efficient Labor Allocation
5. Continuous Improvement
6. Improved Supplier and Customer Relationships
7. Reduced Operational Expenses
8. Better Demand Planning
9. Improved Security
10. Employee Morale

Background

Warehouse Management System

- Cost Breakdown:
  - License fees
  - Custom development
  - Computer hardware
  - Radio frequency hardware
  - Services such as design, implementation, training, testing and travel
- Typical improvements and savings that can be achieved with a successful implementation of a WMS are along the lines of:
  - Labor Utilization 10-45%
  - Inventory Reduction 5-40%
  - Floor Space Utilization 10-40%
  - Maintenance 0-10%
  - Shrinkage 50-99+%
  - Rolling Stock 10-20%
  - Increase Shipping Accuracy to 99%+
  - Increase Data Entry Accuracy to 99%+
- In most cases, operations that do not currently have a WMS can likely recognize ROI in 12 to 18 months (Register, 2015).

Generic cost and saving with a WMS

Background

SWOT Analysis for the Automotive Component Sector

Strength

- Quality and brand image
- Economic of scale
- Consistent demand irrespective of car sales
- Proximity in relationship with automakers
- Rising stock prices beyond the major automaker

01

Weakness

- Lack of dynamism and adaptability
- Inability to identify potential threats
- Cultural factors
- Adopting business efficiencies internally early
- Lack of diversification
- Bureaucracy and slow decision-making ability

02

Opportunity

- Identifying industry disrupters such as autonomous vehicles, IoT based application and leverage technological advances
- Form consortiums and enhance research capabilities
- Have a first mover advantage in patentable technology

03

Threats

- Competition from Chinese auto part makers
- Looming threat of consolidation
- Tech giants such as Google and Apple have their eyes set too
- Regulation and increasing pressure to reduce CO_2 emissions
- Unstable political climate (NAFTA etc..)

04

Background

SWOT Analysis for Company A

Strength

- Company A is a reliable supplier to companies such as Toyota, Nissan, Ford
- Worldwide capability and reach
- Economies of scale in terms of product and capital
- Demand for Company A's products consistent with the automotive sector

01

Weakness

- Balancing act between input and process output
- In terms of operations, decision making is not based on real time smart information
- Lack of incorporating solution based approaches using best practices
- Very old information systems which does not relay accurate information

02

Opportunity

- Large scope of improvement in technology space to relay real time information
- Ability to gain knowledge from sister companies
- Use cultural factors to your advantage
- Create feasible solutions based on internal learning

03

Threats

- Competition
- Lack of consolidation and poor performance
- Outpaced by technology

04

01

WMS’ Effect on Return Goods Process

- Returns process
- Returns policy

02

Dock to Stock Improvements Using a WMS

- Dock to stock technology

03

Overall Labor Utilization

04

Maximizing Warehouse Space Utilization

Literature Review