FEASIBILITY STUDY OF EQUIPMENT BUYBACK MODEL

Industrial & Systems Engineering, IE3100R Systems Design Project

Problem Definition

MOTIVATION FOR BUYBACK PROJECT

- Save cost by recovering durable parts and reselling the remanufactured product as brand new ones.
- Control use of our products by competition
- Be more competitive in low end markets

PROBLEM

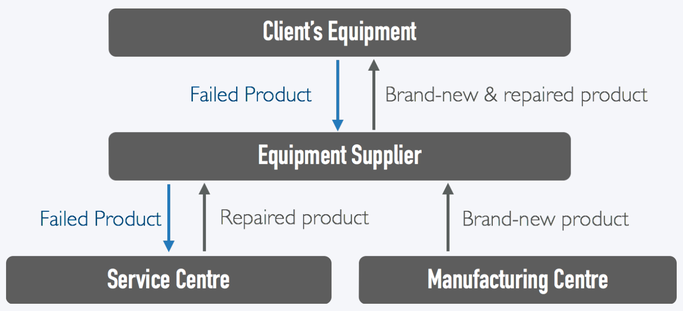
- Profitability unknown
- Non-standardised price
- Lack of incentives for clients

PROJECT SCOPE

- Understand the company business strategies for supplying equipment
- Develop a dynamic set of projections on the cost of equipment resale for individual Area.

Financial Model

THE BUYBACK PROCESS



Example In Asia Pacific region, bought back equipments are sent by the local operations to Singapore first for inspection and certification. And then it is sent to Jakarta, where the Assembly, Repair & Testing Centre in Asia is situated, for remanufacturing.

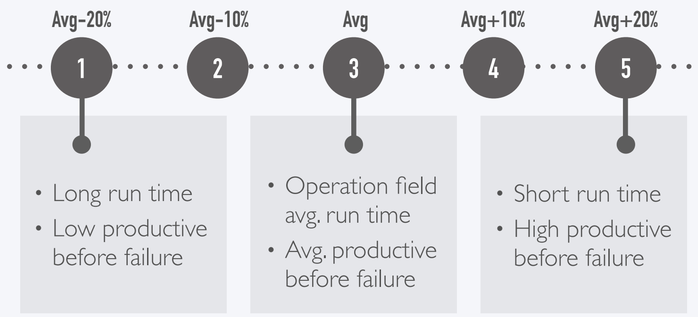
FINANCIAL MODEL

Profit = **Cost Savings** - **Buyback Price** - **Other Costs**

Parameter	Formula
Cost savings	= recovery rate * catalogue price
Recovery rate	= value of product salvaged
Catalog price	= cost of new product
Freight cost	= part weight / container weight capacity * per container freight cost for specific route
Export tax	= export tax rate * buyback price
Import tax	= import tax rate * (total value of goods + freight cost)*(1+insurance rate)
Insurance cost	= insurance rate *(total value of goods + freight cost)

Recovery Rate Scales:

For the ease of decision making, as the actual condition of bought back equipment varies in reality.



BUYBACK CALCULATOR

Function 1 Buyback price

Function 2 Profit margin & salvage rate

Function 3 Buyback price for a list of products

Buyback Calculator Model 1 V0.3

Area	ASA			
Operation Field*	TMG		ART Center	Jarkata
Product Type*	Pump		Part No.	101088152
Cost Rates				
Recovery Rate	5	71.00%	Export Tax Rate	23.75%
Repair Mode	Light		Import Tax Rate	5.00% 0.00%
Other costs ($)	500.00		Insurance Rate	0.50%
			Note: The figure in **blue** color is the default rate.	
Max Buyback Price ($)	9874.04			
Buyback Price ($)	4107.80		Calculate Profit	

Expected profit & profit margin

Suggested buyback price

Expected profit for each product

Sample Report:

Summary Report

No.	Part Number	Product Type	Quantity	Catalog Price ($)	Freight Cost ($)	Insurance Cost ($)	Buyback Price per Unit ($)	Profit ($)
2	100407474	Pump	25	13212.51	62.72	66.38	1750.00	7501.79
4	100374431	Pump	5	12401.44	32.61	62.17	2000.00	6710.24
1	100407474	Pump	10	13212.51	62.72	66.38	500.00	4788.04
5	100177213	Pump	120	12323.27	32.61	61.78	4000.00	4655.13
3	100177213	Pump	40	12323.27	32.61	61.78	3500.00	3922.80
							Other Cost	4536.00
							Total Profit	972467.85

Trade-In Incentives

CREDITS

When a client returns a failed product, instead of paying cash, Schlumberger gives an certain amount of credits to the client which can be used to buy a new equipment.

- 👍 Maintain market share and build brand loyalty
- 👎 Credits > cash payment, transaction recording is needed

DISCOUNTS

Schlumberger sells a new equipment with a certain price discount in exchange for a guarantee that when a product fails, it must be returned to Schlumberger.

- 👍 Lower new contract price
- 👎 Condition unknown until returned

UPGRADING OF EQUIPMENTS

- Regular checking on the products
- Clients return used products when a higher specification is available.

- 👍
  - Products return can be guaranteed
  - Condition of the returned product is expected to be less varied
- 👎
  - Clients may need extra incentives to switch the plan
  - Additional cost may be incurred

Limitation & Recommendations

POTENTIAL ISSUES AND UNCERTAINTIES

Unknown Demand & Supply

- Assuming all failed products will be collected, all repaired products can be sold
- If supply > demand, inventory starts to accumulate

Inventory not Considered

- Assuming unlimited inventory capacity and zero inventory cost
- Inventory cost contributes to the total cost incurred in the buyback process

SC Network & Capacity

- All failed products within a region are sent to one ART Centre
- ART Centre capacity not considered, which may lead to longer flow time

PROCESS IMPROVEMENT

Flexibility

- Handle uncertainties, such as unplanned transaction, involvement of a new logistics provider
- Flexible schedules for collection, disassembly, inspection, as well as warehousing and switch of logistic providers could be made possible with regard to cost savings

Information & Data

- Enable demand and supply forecasting, providing more accurate estimations on revenue and cost
- More data on product price, contracts, cost and etc. could be collected and analysed to generate more insights on the process

Supervisors: Dr. Yap Chee Meng Dr. William Haskell Company Supervisors: Gillian Goh, John Lee

Team Members: Chen Yixin Du Yuhang Kang Dian Li Ruoxi Li Yueqi Xu Meng