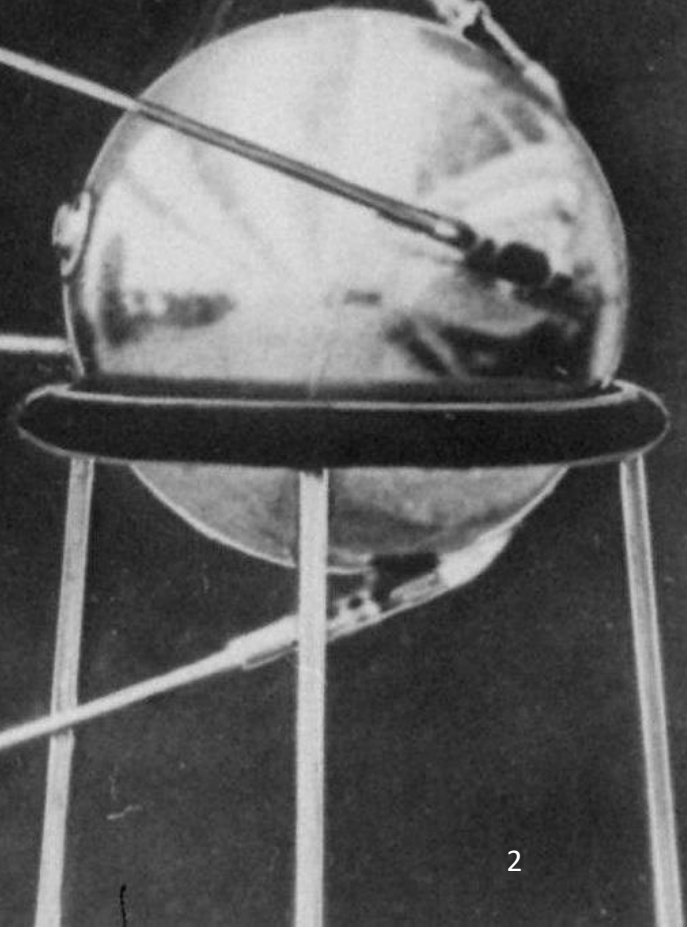


The Changing Role of NASA Cost Analysis

Presenter: John Dotson
KSC Office of the CFO

In the beginning...

- NASA was created in response to the Soviet Union's October 4, 1957 launch of its first satellite, *Sputnik I*
- *Sputnik* launch caught Americans by surprise



- When space race ended NASA still had momentum but struggled to focus
- Budget planning by mission & scheduling became somewhat routine.



Analysis Today

- Now public private partnerships compete for funding
- Focuses on doing the job with less funding



Savage Chickens

by Doug Savage



Overview

Cost benefit analysis is becoming a hot topic at KSC

When NASA or support contractor faces diminishing capacity, excessive costs, experiences problems with current suppliers, or sees changing demand (increased or decreased.)

**Case Study Project
(KSC Paint Shop)**



Data Gathering

Cost of Making

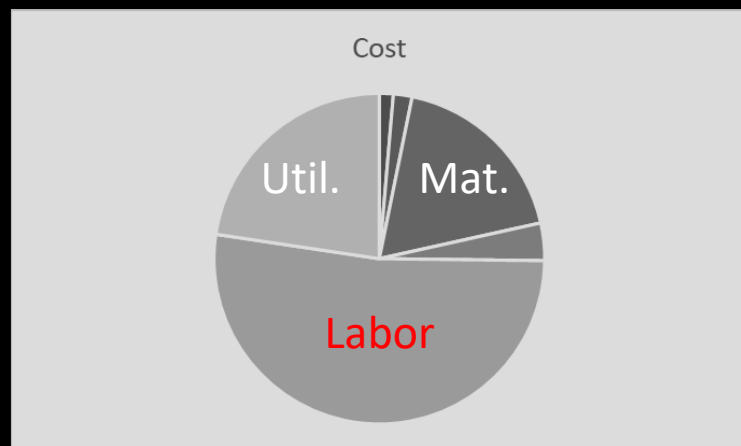
- Facilities
- Utilities
- Waste Disposal
- PPE
- Labor/OT
- 8 Staff
- Materials
- >\$1M Annually Fixed Cost
- \$330K/Annum Facility Costs
- Etc.

Cost of Buying

- Requirements
- Availability
- Schedule Concerns
- Contracts
- Purchase Price
 - Shipping Costs
 - Volume of Purchase

Establishing Make Cost

- Make Cost for a paint shop was established as follows:
 - Facility Costs
 - Labor
 - Production
 - Material Cost/Other Direct Costs
 - O&M Costs



Type:	Cost	
Facilities	\$20K	Fixed
PPE	\$27K	Variable
Materials	\$270K	Variable
Environmental	\$54K	Variable
Labor	\$768K	Fixed
Utilities/Refuse/etc.	\$333K	Fixed
Total	\$1,472K	

(2021 Data) Cost per year

Establishing Buy Costs

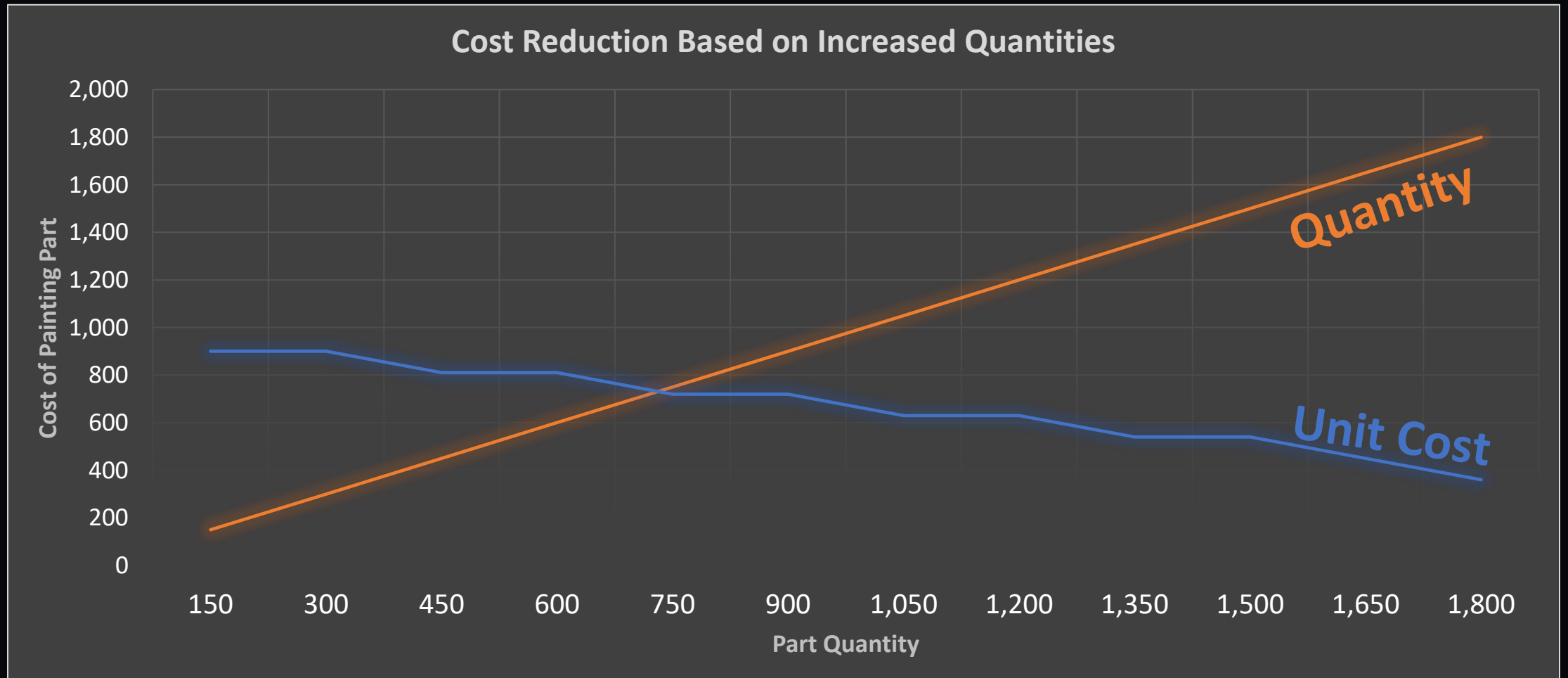
Unit Cost	Quantity	Extended
900	150	\$ 135K
900	300	\$ 270K
810	450	\$ 364.5K
810	600	\$ 486K
720	750	\$ 540K
720	900	\$ 648K
630	1050	\$ 661.5K
630	1200	\$ 756K
540	1350	\$ 729K
540	1500	\$ 810K
450	1650	\$ 742.5K
360	1800	\$ 648K

<https://www.alliance-finishing.com/price-list>

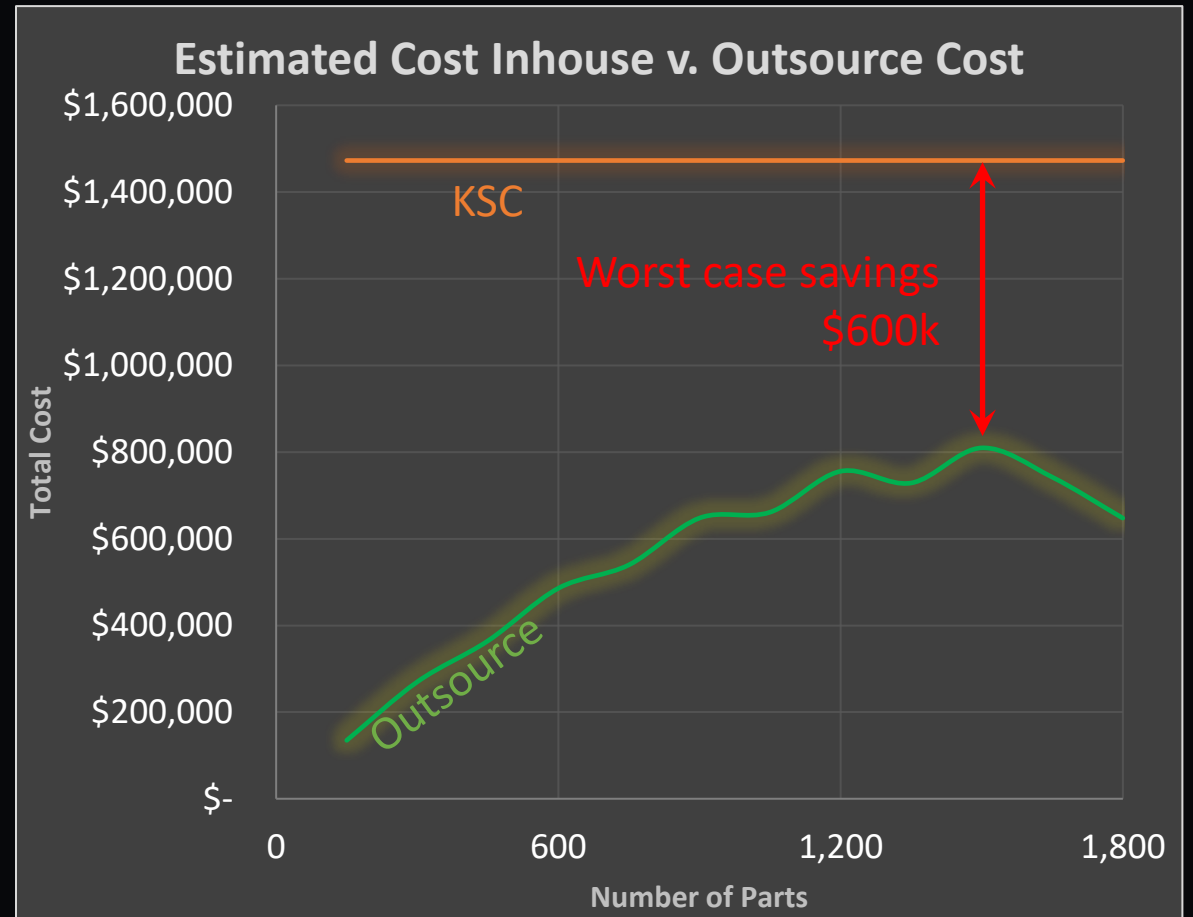
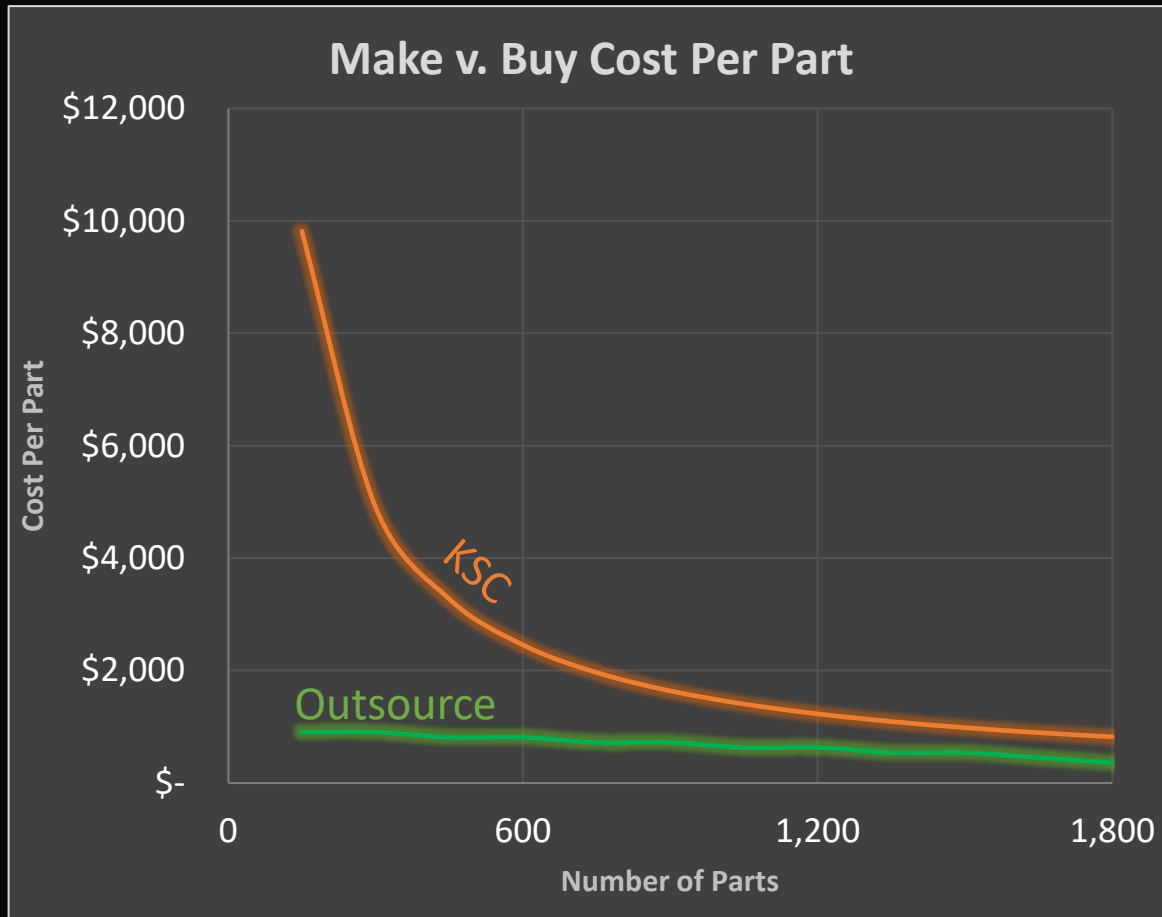
This is the total price of a completed product based on supplied specifications less transportation

Note reduction of unit cost

Outsourcing Economy of Scale



Results of Make Versus Buy



- Based on 1,800 parts
- Shop would have to make over 4,000 parts per year at no additional cost to be competitive

Paying for a standing army

Recommendation & Outcome

Recommendation

- Recommend Closing Paint shop
 - >\$500K reduction/annum
 - Cost savings increase with volume
 - Reduced overhead (O&M)

Outcome

- Recommendation was not implemented.
- Possible conflict of interest in decision making process
- Culture of large program standing work force & lack of planning

Case Study Key Takeaways

- Despite importance of cost analysis, political & other pressures can prevent their implementation
- Previously, political pressure has led to the cancellation of programs that were deemed too expensive, even if they were scientifically valuable
- As the purse strings tighten the role of analysis changes from what will it take to how can we make it work.

People are generally resistant to
any change for any reason



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Backup



Establishing Buy Costs

Hours	Loaded Rate	Dollar Hours	Materials	Environmental	Total cost labor/materials costs	Labor Multiplier/ODC/Profit	Unit Cost	Quant	Extended
3	65	195	150	15	360	250%	900	150	\$ 135,000
3	65	195	150	15	360	250%	900	300	\$ 270,000
3	65	195	150	15	360	225%	810	450	\$ 364,500
3	65	195	150	15	360	225%	810	600	\$ 486,000
3	65	195	150	15	360	200%	720	750	\$ 540,000
3	65	195	150	15	360	200%	720	900	\$ 648,000
								105	
3	65	195	150	15	360	175%	630	0	\$ 661,500
								120	
3	65	195	150	15	360	175%	630	0	\$ 756,000
								135	
3	65	195	150	15	360	150%	540	0	\$ 729,000
								150	
3	65	195	150	15	360	150%	540	0	\$ 810,000
								165	
3	65	195	150	15	360	125%	450	0	\$ 742,500
								180	
3	65	195	150	15	360	100%	360	0	\$ 648,000

Backup

Units	Cost	Total Fixed Cost	Estimated C	Total Outsource
150	\$ 9,816.35	\$ 1,472,453.00	\$ 900.00	\$ 135,000.00
300	\$ 4,908.18	\$ 1,472,453.00	\$ 900.00	\$ 270,000.00
450	\$ 3,272.12	\$ 1,472,453.00	\$ 810.00	\$ 364,500.00
600	\$ 2,454.09	\$ 1,472,453.00	\$ 810.00	\$ 486,000.00
750	\$ 1,963.27	\$ 1,472,453.00	\$ 720.00	\$ 540,000.00
900	\$ 1,636.06	\$ 1,472,453.00	\$ 720.00	\$ 648,000.00
1050	\$ 1,402.34	\$ 1,472,453.00	\$ 630.00	\$ 661,500.00
1200	\$ 1,227.04	\$ 1,472,453.00	\$ 630.00	\$ 756,000.00
1350	\$ 1,090.71	\$ 1,472,453.00	\$ 540.00	\$ 729,000.00
1500	\$ 981.64	\$ 1,472,453.00	\$ 540.00	\$ 810,000.00
1650	\$ 892.40	\$ 1,472,453.00	\$ 450.00	\$ 742,500.00
1800	\$ 818.03	\$ 1,472,453.00	\$ 360.00	\$ 648,000.00