

King Fahd University of Petroleum and Minerals
Construction Engineering and Management Scheduling

CEM512 Value Engineer

Term Project

Value Engineer Study in Purchasing 50 Cars for Company's Salesmen
Working in the Field of Office Equipment Marketing

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1- Introduction:

The idea of this VE term project is a common problem faced on daily basis by most of Saudi Arabia company's working in alternative fields 'bearing in mind that our company's business in our example in this presentation is in the marketing business; in selling and marketing office equipments' which is; What is the best solution of purchasing most suitable cars for the company's salesmen? Starting from the idea of having a least car cost and cover its required function perfectly. Noting that, the company in our example has a good budget power and prefers to purchase the cars rather than rent it and to avoid lease to own interest.

Our project here in is to find the VE for the best car type to be purchased / 50 numbers; for a company as mentioned above working in the field of office equipments marketing.

- This assumed project or idea is based on many facts collected from the market.
- It's a good example, as such idea is a common practice one and it can be seen that the car dealers are competing hardly to win such kind of bids and promoting their items using alternative attractive promotions and offers.
- The VE result (enclosed) is applicable to Saudi Arabia market, but it doesn't mean that it can be applicable somewhere else, due to alternative criteria related to the local market which might not be applicable somewhere else.

2- VE Job Plan

- 2.1- Information Phase
- 2.2- Functional Phase
- 2.3- Creative Phase
- 2.4- Judicial Phase
- 2.5- Development Phase
- 2.6- Audit Phase

2.1- Information Phase

Study Premise / Project Information and Company's Item Criteria

- As mentioned before, the project or the task of the VE is to select the best 50 cars number to be purchased for the company's salesmen working in the field of office equipments marketing. As such selection should make sure it achieves the least car cost and covering it's purpose / desired function perfectly.
- It's required to be mentioned that in the given handout it states to find an item which is seen to be of poor VE and develop VE on that basis, but in our case herein no need to do so as VE can be done during the project design phase which is quite effective, as doing VE at the earliest design selection stage leads to proper decision and time saving, which reflects in cost saving as well, as no more extra hours to be wasted by the company's staff for further selection development stages. Noting that, such VE can be done by the procurement department of the company and in consultation with car dealers.
- The company's criteria for the car is as follows (Noting that the ranking of such criteria from most priority and less will be found in further VE stages of this presentation and not as in order hereunder):
 - a- The car cost not to exceed SR 50,000
 - b- The cars to be replaced every five years / paid cash
 - c- Economic / gasoline consumption
 - d- Spare parts availability and good maintenance / car agency
 - e- Good re-sale / salvage value after five years, as the car model changes every five years in general concept.
 - f- Good mechanics of the car
 - g- Presentable car to give good impression of the company's image / noting that, not a luxury car is meant by this
 - h- The car to be of its basic functions only
 - l- Reasonable car size
 - j- Safety at road

Noting that the mileage of each car / month is 7500km as per company's statistics

I've taken the consultation concerning the cars from two resources:

1- From the surrounding personnel and their expertise in this field and the reputation of alternative cars each alone.

2- From my observation and expertise of the last seven years I have spent in Saudi Arabia.

In addition find below a list of car agencies that I have contacted and I took their consultation related to alternative issues and mainly that covered under project / company's criteria:

Contact	Telephone #:	Major Points
Al-Esayi Trading Corp.	03-8571807	General points mainly related to the project criteria
Safari MOTORS	03-8589045	
Abdullatif Jamil Limited Corp.	05-5867982	
KIA Motors Corp.	82-2-3464 2797	
Al-Jabr Trading Co.		

Performance Criteria:

Objective or Required Criteria:

- 1- To meet the criteria listed under project criteria and mainly that related to budget, maintenance, salvage value and economy.
- 2- Reasonable size and shape that can serve the purpose of car function from the aesthetic point of view.
- 3- Good performance on the road and especially that related to safety due to the presence of highways and high speed in KSA roads.
- 4- Comfortable driving

Goals, Desired Criteria or Features

- 1- Reputable car
- 2- Reputable car agency offering good and quick service
- 3- Available auto parts
- 4- Safety and performance on the road
- 5- Initial cost of each car not to exceed SR50,000
- 6- Heavy duty

Cost Data:

This item will be looked for after generating the ideas based on which the proposed car types will be set out and evaluation process will be carried after.

2.2- Functional Phase:**Functional Worksheet:**

Why?	Function	How?
Cars meet the budget	To serve the desire function / salesmen	To have transport proper decision
With low maintenance	Meet the proper prestigious needs	Meeting the set out criteria of the project
With low depreciation / Good salvage value	Safety at road	

Identify Item Function:**What does it do?****verb**

Transport
Ensure
Provide

noun

Salesmen
Safety at Road
Good Image

what must it do?**verb**

Perform
Be
Improve

noun

Well
Economic
Image

(The item function is describe as verb/noun functions)

2.3- Creative Phase:

Generate Ideas:

Here below are alternative ideas proposed to be studied and evaluated to choose the best alternative, bearing in mind that such ideas are generated from market reputation in this field in relation to the car size relative to the project criteria:

- 1- Nissan Sunny / 1.8-liter, 4 cylinders
- 2- Honda Civic / 1.7-liter VTEC, 4 cylinders
- 3- Toyota Corolla / 1.8-liter VVT, 4 cylinders
- 4- KIA CERATO / 1.6-liter, 4 cylinders
- 5- Mitsubishi Lancer / 1.6-liter, 4 cylinders
- 6- Seat Toledo / 1.6-liter, 4 cylinders
- 7- SKODA OCTAVIA / 1.6-liter, 4 cylinders

Noting that, the above mentioned cars have approximately equivalent gasoline consumption.

Notes:

- Under this creative stage of the value study. Many ideas are generated (above), process or methods to fulfill the function that the item under study must perform. And ideas evaluation will be occurred accordingly, without deleting or canceling any idea.
- The cars were chosen on the basis of what has been mentioned previously and from alternative sources: Japanese, Korean and European.

Before we continue to the Judicial Phase, find below the cost data (car initial cost plus other costs for the previously generated ideas / proposals. Noting that, the insurance cost is not mentioned since such value is 6% equivalent to each others.

<u>No.</u>	<u>Car Brand Name / Particular</u>	<u>Cost / pc</u>	<u>Quantity</u>	<u>Total</u>
01	Toyota Corolla	SR49500	50	SR2475000
02	Honda Civic	SR48500	50	SR2425000
03	Nissan Sunny	SR49000	50	SR2450000
04	Mitsubishi Lancer	SR40400	50	SR2020000
05	KIA CERATO	SR37500	50	SR1875000
06	SEAT TOLEDO	SR60000	50	SR3000000
07	SKODA OCTAVIA	SR54000	50	SR2700000

In addition to the above car initial cost information additional information related to car maintenance cost / year, salvage value after 5 years are to be added and as follows:

<u>No.</u>	<u>Car Brand Name</u>	<u>Maint/year</u>	<u>Maint/5yrs</u>	<u>Salvage Value</u>
01	Toyota Corolla	SR4000	SR20000	SR18000
02	Honda Civic	SR3000	SR15000	SR14000
03	Nissan Sunny	SR3600	SR18000	SR18000
04	Mitsubishi Lancer	SR4400	SR22000	SR11000
05	KIA CERATO	SR3000	SR15000	SR10000
06	SEAT TOLEDO	SR4600	SR23000	SR16000
07	SKODA OCTAVIA	SR4200	SR21000	SR13000

Noting that, the maintenance / year is in condition the car mileage is 7500/month and the salvage value is applicable for good car condition / approx. 400,000km mileage.

2.4- Judicial Phase:**Feasibility Ranking:**

	Safety	Aesthetic	Performance	Salvage Value	Maintenance	Initial Cost	Total	Rank
Toyota Corolla	6	7	7	7	7	6	40	3
Honda Civic	8	10	7	6	5	5	41	2
Nissan Sunny	7	9	8	7	6	7	44	1
Mitsubishi Lancer	9	5	9	3	4	3	33	7
KIA CERATO	10	10	10	3	3	2	38	5
Seat Toledo	2	3	2	10	10	10	37	6
SKODA OCTAVIA	3	6	3	9	9	9	39	4

Determining Weights for Evaluation:

Goals, Desired Criteria, Functions and Features:

		Raw Score	Assigned Weight
A-	Initial Cost	8	10
B-	Maintenance	7	9
C-	Salvage Value	4	5
D-	Performance	3	4
E-	Aesthetic	1	2
F-	Safety	5	6

Scoring Matrix

	<u>B</u>	<u>C</u>	<u>D</u>	<u>E</u>	<u>F</u>
<u>A</u>	A/B	A/C	A-2	A-3	A-1
	<u>B</u>	B/C	B-1	B-2	B/F
		<u>C</u>	C/D	C-1	F-1
			<u>D</u>	D-1	D/F
				<u>E</u>	F-2

How Important:

- 3- Major Preference
- 2- Medium Preference
- 1- Minor Preference

Evaluation Matrix:

Safety

Aesthetic

Performance

Salvage Value

Maintenance

Initial Cost

10 9 5 4 2 6

							Total	Rank
Toyota Corolla	4	3	4	4	4	4	135	4
Honda Civic	4	5	4	4	4	3	147	2
Nissan Sunny	4	4	4	4	4	4	144	3
Mitsubishi Lancer	5	3	5	3	2	2	130	5
KIA CERATO	5	5	5	3	2	2	148	1
Seat Toledo	2	1	2	5	5	5	99	7
SKODA OCTAVIA	3	2	2	5	5	5	118	6

Savings:

On the basis of the previous results the savings in money (SR) will be as follows if compared to ranked 2 & 7 ideas:

	<u>Item</u>	<u>Initial Cost</u>
1-	KIA CERATO	SR1875000
2-	Honda Civic	SR2425000
	Saving in initial cost	SR550000
		=22%reduction

Life Cycle Cost Results

<u>Idea</u>	<u>Maintenance/5yrs</u>	<u>Lost between initial cost & salvage value</u>	<u>Total</u>
1-KIA CERATO	SR15000	SR1375000	SR1390000
2-Honda Civic	SR15000	SR1725000	SR1740000
		Saving in Life Cost Cycle	SR350000
			=20%reduction

	<u>Item</u>	<u>Initial Cost</u>
1-	KIA CERATO	SR1875000
7-	Seat Toledo	SR3000000
	Saving in initial cost	SR1125000
		=37%reduction

Life Cycle Cost Results

<u>Idea</u>	<u>Maintenance/5yrs</u>	<u>Lost between initial cost & salvage value</u>	<u>Total</u>
1-KIA CERATO	SR15000	SR1375000	SR1390000
2-Seat Toledo	SR23000	SR2200000	SR2223000
		Saving in Life Cost Cycle	SR833000
			=38%reduction

2.5- Development Phase:

Value Study Summary (Ranked-1 Proposal):

The ranked –1 proposal has alternative profits and benefits superior on the others which lead to the choosing of this proposal and such profits are as follows:

- 1- Saving money from the budgeted money for the project.
- 2- Maintenance and spare parts availability and prices are quite satisfactory.
- 3- Acceptable performance for the purpose of the car using function.
- 4- Acceptable car looking and reasonable salvage value.
- 5- Gasoline consumption much less than the alternative proposals.

For that, the proposed ranked-1 idea will meet the project criteria and even saving money from what has been budgeted originally.

Implementation Phase:

This VE proposal can be carried out by the procurement department or the salesmen, as they are aware and have good knowledge in marketing and under this phase alternative questions to be implemented to ensure VE implementation properly. These questions are as follows:

- 1- **How should it be implemented?**
The proposed case has to be presented to the company's General Manager and Procurement Manager for their review and approval.
- 2- **What should be changed and in what sequence?**
The proposed idea after being presented and explained 'in comparison to other ideas and on the basis of actual facts and market study' to the General Manager and Procurement Manager, the latest might raise up few changes either in the car specification, etc.
- 3- **Who should do it?**
The procurement department should take the presentation proposed data and implement it accordingly.
- 4- **How long should it take to implement the proposal?**

As known from the car agency for KIA, purchasing the 50 numbers car will be done in 15 days from the time of releasing the purchasing order. Noting that, no modification to the original proposal to be wasted since VE took place at design stage.

- 5- **Any deadline required:**
Subject to management forecast.
- 6- **Modification implementation cost, internal hours?**
Zero, refer to what has been stated under above item #:4.

2.6- Audit Phase:

The audit phase will be taking place after purchasing the cars and monitor the proposal implementation if relative the that mentioned under VE proposal or not and do the corrective paving for any deviation from the VE proposal in the future after documenting the implementation observation.

Attached is the power point presentation