

KING FAHD UNIVERESITY OF PETROLEUM & MINERALS

Construction Engineering and Management Department

CEM 512

TERM 043

**LAPTOP SELECTION
USING VALUE ENGINEERING**



Prepared by:

Mazen A. Al-Juaid

ID # 964726

Student # 11

Instructor:

Dr. Saadi Assaf

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I) INTRODUCTION

The need of computers is very well recognized to everybody and nowadays it became essential for businesspeople, students, instructors, office workers and almost everybody to have a laptop. Therefore, a friend of mine wanted to buy a laptop and he sought my advice. My mission was to apply Value Engineering technique in order to help him to select a laptop among the available brands in the market. The selection of the laptop will be subjective to the requirements of my friend who will be referred to as "the owner" in this study.

II) STUDY OBJECTIVE

The objective of the study is to utilize the Value Engineering technique going through all steps of its job plan to select a laptop among the available brands in the market to fulfill the requirement of the owner.

III) VALUE ENGINEERING JOB PLAN

The Value engineering Job Plan is an organized plan of action for accomplishment of value engineering studies.

In general, the value engineering study should be organized into seven distinct parts comprising the value engineering Job Plan:

1. Information phase
2. Speculation phase
3. Analysis phase
4. Development phase
5. Presentation phase
6. Implementation phase
7. and Audit phase

i) Information Phase

Project:

The project is to select a laptop among the available brands in the market for personal use.

Consultation Records:

INFORMATION PHASE	CONSULTATION RECORDS
Information contact	Major points of data received
1. Jarir bookstore	Costs and features
2. Compu me	Costs and features

Performance criteria:

In order for the study to be consistent, it was decided to have fixed features in the sought laptop. This will make the comparison of laptops from different brands easier as they will have almost the same features which are of the owner interest and requirement.

The provided laptop should have the following features:

- Processor type: Intel Centrino
- Processor speed: 1.7 GHz
- System memory: 512 MB RAM
- Hard drive capacity: 60 GB
- Operating system: Windows XP Professional

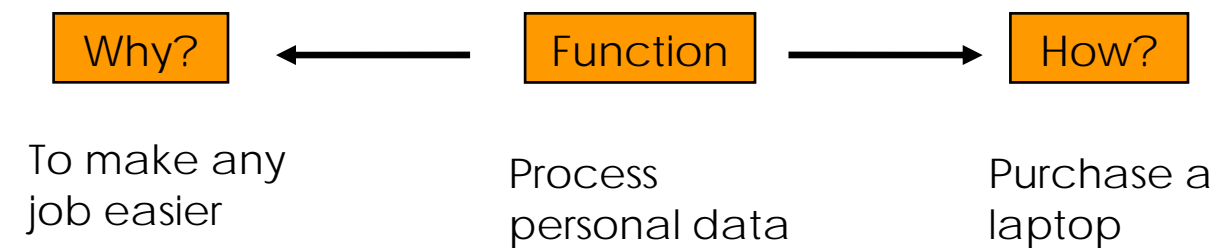
Function:

The function of the item to be studied which is the laptop is as follows:

Verb	Noun
Process	personal data

So it is to process personal data.

Simply, the following sketch answers the questions of why and how is this function:



Cost Data:

INFORMATION PHASE	COST DATA
Laptop	Initial Cost
Toshiba	6,299
Dell	5,499
HP	5,599
Fujitsu Siemens	4,399
Acer	5,199
Sony	8,199

ii) Speculation Phase

Generated ideas:

Many brand names for laptops were suggested in this phase of the study as ideas. These ideas are:

- Toshiba
- Dell
- HP
- Fujitsu Siemens
- Acer
- Sony

iii) Evaluation Phase

Preliminary screening:

Among seventeen suggested brand names of laptops only six were chosen after applying the “Advantage Versus Disadvantage Technique”. For the sake of simplicity, the advantages and disadvantages of the six chosen alternatives are listed in the table in the next page.

Idea	Advantage	Disadvantage
Toshiba	<ul style="list-style-type: none"> • Low maintenance cost 	<ul style="list-style-type: none"> • Heavy weight
Dell	<ul style="list-style-type: none"> • Nice looking 	<ul style="list-style-type: none"> • Short battery life
HP	<ul style="list-style-type: none"> • Low maintenance cost • Nice looking 	<ul style="list-style-type: none"> • Heavy weight • Short battery life
Fujitsu Siemens	<ul style="list-style-type: none"> • Low initial cost • Light weight 	<ul style="list-style-type: none"> • High maintenance cost
Acer	<ul style="list-style-type: none"> • Low initial cost 	<ul style="list-style-type: none"> • Not nice looking
Sony	<ul style="list-style-type: none"> • Light weight • Long battery life 	<ul style="list-style-type: none"> • High initial cost

Weighting Alternatives:

In order to weight alternatives; first, different criteria which are of interest and importance of the owner were listed and weighted versus each other. Then, each alternative was weighted versus each criteria based on its importance using the evaluation matrix. Finally, alternatives were ranked based on there scores.

Selected Criteria:

- A. Initial Cost
- B. Maintenance Cost
- C. Battery life
- D. Weight
- E. Aesthetic
- F. Obsolescence

	Raw score	Average weight
A. Initial Cost	10	10
B. Maintenance Cost	3	3
C. Battery life	4	4
D. Weight	9	9
E. Aesthetic	4	4
F. Obsolescence	1	1

1. Minor preference
2. Medium preference
3. Major preference

	B	C	D	E	F
A	A-2	A-2	A/D	A-2	A-3
B		B/C	D-2	E-1	B-2
C			D-2	C/E	C-2
D				D-2	D-2
E					E-2

Evaluation Matrix:

Obsolence								
Aesthetic								
Weight								
Battery life								
Maintenance Cost								
Initial Cost								
		10	3	4	9	4	1	Total Weight
1. Toshiba	2	5	4	1	2	5	73	6
2. Dell	3	3	1	3	4	4	90	4
3. HP	3	4	2	2	4	3	87	5
4. Siemens	5	1	5	4	2	2	119	1
5. Acer	4	3	4	4	3	1	114	2
6. Sony	1	2	4	5	5	3	100	3
								Ranking

It was resulted form the evaluation matrix that the Fujitsu Siemens Laptop was ranked as the best. However, the Acer Laptop scored the second best in ranking and was much closed to the Siemens; therefore both alternatives will be evaluated further from the perspective of their life cycle costs in the next phase.

iv) Development Phase

Life Cycle Cost:

The LCC of the higher two rating ideas was calculated assuming a service life of six years and 5% discount rate.

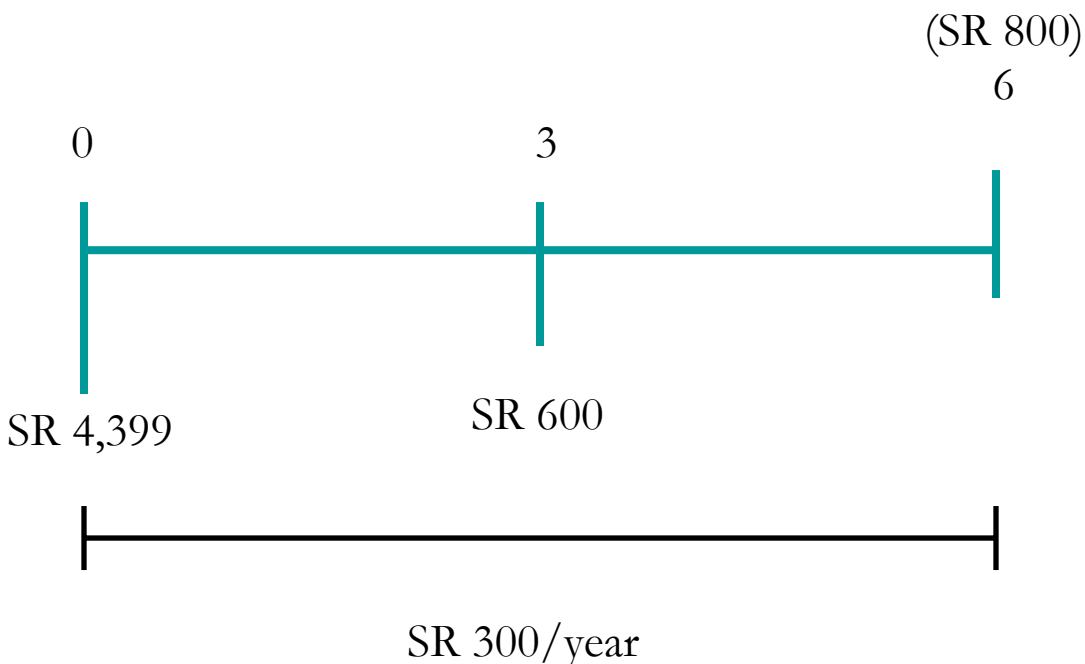
For Fujitsu Siemens Laptop:

Initial Cost: SR 4,399

Replace Battery (3 years): SR 600

Annual Maintenance: SR 300

Salvage: (SR 800)



$$P = \text{SR } 4,399 + \text{SR } 600 (P/F, 5\%, 3) + \text{SR } 300 (P/A, 5\%, 6) - \text{SR } 800 (P/F, 5\%, 6) = \text{SR } 5,843$$

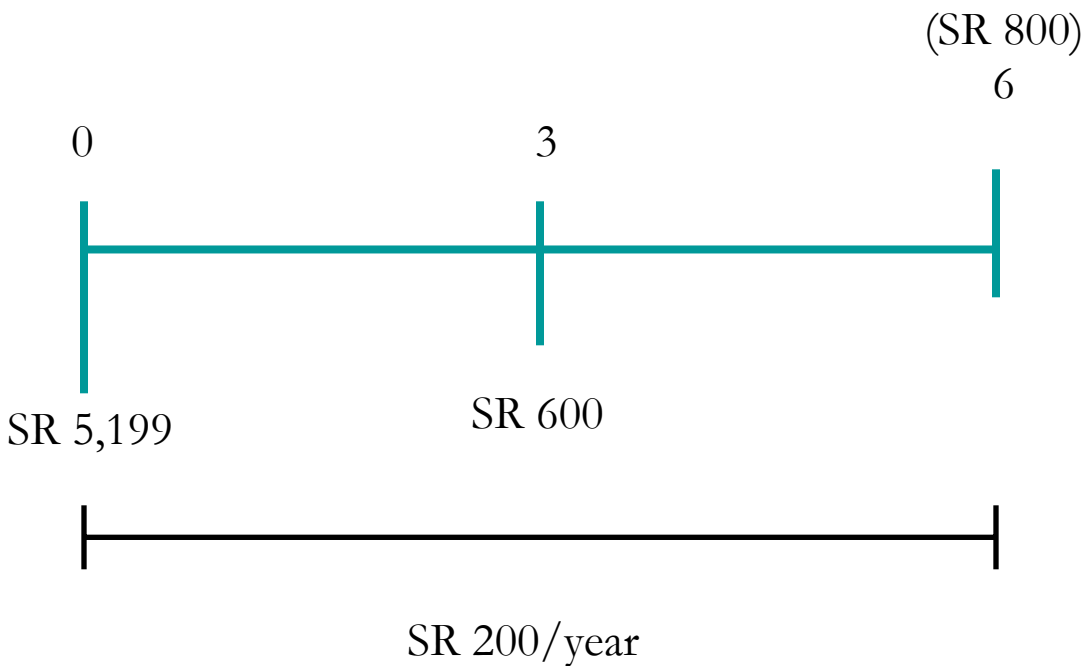
For Acer Laptop:

Initial Cost: SR 5,199

Replace Battery (3 years): SR 600

Annual Maintenance: SR 200

Salvage: (SR 800)



$$P = \text{SR } 5,199 + \text{SR } 600 (P/F, 5\%, 3) + \text{SR } 200 (P/A, 5\%, 6) - \text{SR } 800 (P/F, 5\%, 6) = \text{SR } 6,643$$

Since the Fujitsu Laptop showed less life cycle cost of **SR 5,843**, it was the best alternative and therefore chosen one.

Extra information:

The following are some extra data and basic information about the selected alternative.

Fujitsu Siemens:

Processor type: Intel Centrino

Processor speed: 1.7 GHz

System memory: 512 MB RAM

Hard drive capacity: 60 GB

Drives included: DVD-Dual

Screen: 15.1" LCD XGA color

Modem speed: 56 Kbps

wireless communications: wireless LAN 802.11b/g

Operating system: Windows XP Professional

Warranty: 3 Years

v) Presentation Phase

The objective of the Presentation Phase of the Value Engineering Job Plan is to put the recommended alternatives before the decision makers in such convincing terms that they will accept them.

The recommendation of purchasing a Fujitsu Laptop was presented to the owner who for his implementation.

vi) Implementation Phase

The objective of the Implementation Phase of the Value Engineering Job Plan is to assure that approved proposals are rapidly and properly translated into action, to achieve the savings or project improvements that were proposed.

In this phase, the owner was pleased to buy the Fujitsu Siemens Laptop with the amount of SR 4,399.

IV) CONCLUSION

It was concluded that the Fujitsu Siemens Laptop is recommended for the owner to purchase in order to use for processing personal data.

The Fujitsu Siemens was selected among other different alternatives as it serves the main functions of the owner requirements as well as it is the most cost effective among others.