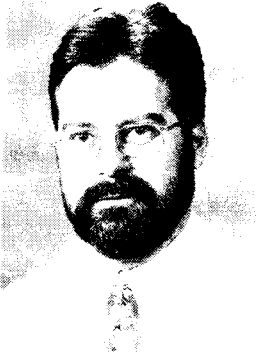


## VALUE ENGINEERING TRAINING IN SAUDI ARABIA WITH A PARTICULAR REFERENCE TO MOMRA'S PROGRAM

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### ABSTRACT

This paper describes the history of value engineering training in Saudi Arabia with a particular focus on a newly established 4 months accredited training program at Ministry of Municipals and Rural Affairs (MOMRA), Riyadh, Saudi Arabia.

### INTRODUCTION

Saudi Arabia lies on the heart of the Middle East with a population of almost 16 millions. In the eyes of western development countries, it classified as one of the richest countries or a "Wealthy Penninsula" with an outstanding record of economical and political stability. However, Saudi government had realized, much earlier, that oil, the powerful resource, may not last longer in terms of depletion or price declination. Accordingly, politicians and policy makers are heavily relied on what it calls "The Development Plans-5 years interval). It started off at 1970 and kept on going. The overall strategy of all plans is mainly concentrated on "Human resources", the real asset for the next Millenium's challenge.

As a result, thousands of graduates and even undergraduate were highly educated and trained in the USA, Canada, Europe, Japan and neighboring Arab Countries.

The paper will review the value engineering training history in Saudi Arabia in both public and private sectors, then a great emphasis will be concentrated on the unique, accredited, VE training program which is successfully developed and performed by the Ministry of Municipals and Rural Affairs (MOMRA).

### HISTORY OF VE TRAINING IN SAUDI ARABIA

Figure 1. Shows briefly the roadmap of value engineering (VE) training in Saudi Arabia (SA). It goes back to 1975 where two of engineering officers at General Directorate of Military Works (GDMW), Ministry of Defence and Aviation (MODA) were flown to U.S.A. to attend a VE training program (one week workshop) which was organized by U.S. Corps of Engineers.

In 1982, the first VE training seminar was held in Riyadh, Saudi Arabia with assistance from a well known VE consulting firm. Overwhelmingly, 150 engineers and professionals have been attended.

GDMW in 1985 decided, and after a wide spread success of VE concept in S.A, to set up its own VE training department as a permanent program with allocated budget. The program yet to be developed and VE consultant was invited to accelerate, wipe out any hurdles, and finally and most critically, to convince the top management with go ahead. Essentially, the main purpose of establishing VE department was not to deliver only seminars and workshops, but to utilize and implement such a powerful, and specialized cost control technique in (MODA)'s mega projects across the Kingdom and especially during the economical boom in the 80's.

The VE contributions were absolutely amazing, and hundreds of millions of Saudi riyals have been saved or best utilized.

One year later, the VE dept. was finally founded in GDMW and (Called VE Division) training programs kept on going as per plan.

In 1990 , the division was fully and independently operated by Saudi certified VE specialists.

### GDMW NATIONAL TRAINING STRATEGY

Despite the great success of VE in terms of money savings and training of a large number of Saudi engineers, architects and other professionals, the government was reluctant to regulate or enforce other public engineering departments to clearly apply VE in there contracts.

Alternatively, GDMW courageously took the lead in spreading out the approach among other public and private sectors throughout a well managed, and long range training plan. In several occasions, GDMW had prosperously addressed the issue to interested governmental departments / administrations, universities and other businesses whom gradually welcomed and accepted the approach. The following part elaborates on VE training in public and private sectors in (S.A).

### VE TRAINING IN PUBLIC SECTOR

The public parties who have shown great interest in VE are presented in Figure 1 as follows:

#### 1- King Saud University (KSU)

The oldest and largest university in (SA), founded in 1957 with 2 faculties; Arts and Sciences. Currently, KSU hosts more than 10 colleges and faculties with an average annual graduation of 45,000 students. As an educational institution, VE training started in 1988 at College of Engineering. Staffs have considered VE to be taught first at post-graduation scheme; Master degree as one of its Construction Management courses. Soon after words they are becoming more confident and willing to participate in VE consultation out side the university where they were invited to contribute into governmental projects; Healthcare, Educational facilities & infrastructures.

#### 2- The Engineering Committee (EC)

The Engineering Committee operates as a Saudi Institution or Society of Engineers. It is established in 1982 and regulates liscences to Consulting and Engineering Offices and provides professional services to its members. Currently, the registered Offices exceeds 2000 and with 4000 subscriber members. The relation to VE training goes back to 1989 when the author, the first Head of training and programs at EC, had approached the General Directorate of Military Works (GDMW) to accept the invitation to launch, the first of its kind - VE training program

series (3-day each - "Introduction to VE") in the 3 largest cities of the Kingdom; Riyadh, Jeddah, and Dammam.

Dr. Stephen Kirk, SAVE Int. current president, was the main Instructor and was assisted by two Saudi CVS's. The level of attendance was extremely marvelous and a great enthusiasm among consulting engineers and architects have shown. Accordingly, the Engineering Committee had realized how significant is the VE approach and hence plan to carry on scheduling annual training programs for its members. Since 1994, the EC coordinates with the (SAVE Int. - Saudi VE local chapter) for the selection of VE seminars, workshops topics, and Instructors / facilitators.

#### 3- The Institute For Public Administration (IPA)

It is purely governmental training center, the Institute's mission is to upgrade and enhance the skills and talent of the Civil Service Employees. It is founded in 1961 and annually runs over 100 courses and seminars of different disciplines. The first connection with VE training was recorded in 1990 were it considered to be taught under engineering programs which represents only about 5% of the Institute's overall training schedule. Till the end of 1998, the VE section have arranged 13 programs (called 4 weeks Module) and as many as 210 governmental engineers and professionals were participated. In one occasion (Dec. 1997), the Institute had organized a one-day symposium on VE entitled "VE between Reality and Applications", and the attendees had exceeded 300.

#### 4- Ministry of Municipals and Rural Affairs (MOMRA)

MOMRA is the 2<sup>nd</sup> largest Ministry, after Ministry of Defence & Aviation, whom acknowledged VE approach. In 1995, the Value Engineering department has been established by two former MODA'S (CVS's) staff. MOMRA' top officials were highly convinced that municipal's high cost projects can be better off and well managed by utilizing value engineering powerful technique. Much details on MOMRA training program will be presented later on the second part of this paper.

### VE TRAINING IN PRIVATE SECTOR

Available records indicated that Project Analysis & Control System, W.L.L. or "Projacs" & Associates was the first firm, with especiality in Construction Management & Information Systems, to organized the first VE series training programs in the Arabian Gulf area in June 1986.

Instructional / training staffs involved are among the best and highly effective speakers from GDMW and American well known firm SH & G (namely A. Dell'Isola and Donald Parker). After a remarkable success and regional expansion (Kuwait, Bahrain, and U.A.E). A Saudi sister company "Saudi Projacs" was officially formed in Dec. 1992.

The first VE seminar was held in May 1993 at Riyadh, and was considered to be as one of the best and most profitable seminar in Saudi Arabian VE training history.

Again, the author had played a tremendous role in brining this program into success when he was the first **Saudi Projacs - Training & Development Manager** (1992-1994). The Board of Directors realized that VE is becoming very important to engineers and project managers and as a result they have approved a fixed annual schedule for VE courses. As an average, 3-4 programs conducted inside the Kingdom and other 2-3 summer courses and overseas conferences (U.S.A, U.K, Lebanon, and other neighboring Arab countries) are scheduled.

In total, approximately 400 project and construction managers and engineers have been trained. And from success to success, **Saudi projacs** became a leader in VE training in the private sector in Saudi Arabia.

**Nabil Abbas**, a Construction Contract Consultant with an association of CAMPTECH, based in Jeddah, (S.A) had also started his own business in VE training in 1993. Unfortunately, not too much details about his VE programs have been revealed and published in public. An estimate of 8 programs and 120 participants have been forecasted. This is probably due to his competitive strategies.

However, it is extremely amazing to conclude that public sector have tremendously dominating the VE arena in the Kingdom, contrary to some other western countries as it was published.

#### PRIVATE SECTOR: VE TRAINING IS THE KEY FOR SUCCESSFUL BUSINESS

From the previous, narrative and descriptive part of the private VE training in (SA). It reveals that all of the training providers are specialized Construction and Project management firms. The reason behind was the uncertainties of VE future in the Kingdom in its early days and lack of government (regulations or incentives) support for local companies. Moreover, not too many Value Consultants and CVS's were available.

Strategically speaking, **Saudi Projacs**, for example, had prosperously used VE training programs to promote its full Construction Management Services.

Accordingly, more than 19 VE jobs and 771 aggregate number of VE proposals have been recorded (personal reference 1997/1998). As a business flourishing, two more new offices were setup; Florida (USA) and Bangkok and more VE study contracts are awarded.

#### MOMRA'S TRAINING PROGRAM

MOMRA'S Training Program (MTP) effectively commenced in Feb. 1998. The lag period between 1995 and 1998 was maturely enough to prove the merit of the powerful technique and its accompanied sound results for opponents and critics whom have some doubts about VE in the Ministry and other public sectors alike.

With budget constraints and limitation at most of government administrations, Ministry's top official became aware of ongoing and future spending. Consequently, they have agreed that any project exceeds SR. 30 million (US\$ 8 million) should be value engineered.

Growing demand on continuous municipal works and services (water networks and sewage treatment plants, roads & bridges rehabilitation, solid waste, and stormwater projects) had strongly forced VE department to accelerate its training program. This will also support government's national policy in "Saudiazation" campaigns by allowing more Saudi engineers to take vital roles in VE studies and became more qualified and hence encourage them for certification.

#### • **The Program's Objective**

The 4 months, training program is basically designed to ascertain the following objectives:

1. to pre-qualify VE staff team members working at VE department,
2. to train Saudi qualified engineers working at public sector with preference given to MOMRA'S Staff, and
3. to spread out VE concept and applications among governmental agencies's engineers and other professionals.

Figure 2. Illustrates, simply, the F.A.S.T diagram for the training program to enable participants to fully understand the essence of VE.

**• Preparation & Accreditation**

A tremendous effort has been made to achieve the Ministry's goal in developing such a program. This is due to its infancy nature, it did require a great deal of preparation and, approvals.

However, a very detailed contents program supported by an intensive, systematic and creative proposals has been forwarded for accreditation body at General Bureau of Civil Service (Training Division committee, order No. 044525, dated, 1997). Several meetings were arranged for staff interviews and to have assurances of compliance with standards (no. of hours, qualification of Instructors/training staff materials provided ... etc.).

With regard to the training program's main components, the following are addressed:

- A. Candidate's Nomination & Registration
- B. Program's core (Flow Model)
- C. VE Training Staff
- D. Progress & Achievement ( Evaluation)
- E. Training Program Manual

**A. Candidates Nomination & Registration.**

It was decided that only 3 candidates are to be accepted for the 1998. However, invitation letters sent to all Ministry's departments (more than 140 main and branch municipalities and related agencies around the Kingdom). The response was overwhelmingly superb and the selection criteria had played a significant role in short listing the finalists.

In addition to the personal interviews, the following basic qualifications were essentially required for entries:

1. Be a Saudi national
2. Holding at least a B.Sc. in Engineering or equivalent.
3. At least 5 years of experience, particularly in design.
4. With good communication ability in English language.

**B. Program's Core**

The essence of the program was mainly divided into two parts as shown in the flow model diagram ( Figure 3 ) :

**I- VE Seminar/Course:**

This part consists of three events or training courses namely as follows:

- 3-day (24 hrs.) seminar/course "Introduction to Value Engineering",
- 5-day (40 hrs.) approved Mod-I workshop, and
- 3-day (24 hrs.) VE Seminar (Environmental).

These courses were not restricted to the (3) Candidates only but other public sector staff were also participated (30 participants in total).

**II- VE Projects:**

Two medium to large sized projects were chosen for VE studies during the training program. The same diagram illustrates the existence of these projects at the middle of the 4 months period (March and April) where the VE Consultant was present. The reason behind is to enable trainees to gain the maximum benefits after the first 4 weeks of familiarization with VE technique.

**C. VE Training Staff**

The training staff at VE department, MOMRA was selected from a high caliber of experienced professionals and they form the following team members:

Ministry's Position	No	Prof P.N	Qualification	No of Exp	VE Engamt.
Director General Planning & Budgeting	1	CVS	M.Sc. (Civil)	20	Full- time
Director, VE Department	1	CVS	B.Sc. (Civil)	20	Full- time
Manager, VE Division	1	AVS	B.Sc. (Civil)	15	Full- time
Director, VE Training & Research	1	CPEng	Ph.D. (Civil)	22	Full- time
<b>Engineers</b>					
Environmental	1		M.Sc.	> 10	Full- time
Electro/Mech'l.	1		B.Sc.	> 10	Full- time
Cost/Architect	1		B.Sc.	> 10	Full- time
VE Consultant	1	CVS	B.Sc.	20	Visiting

**D. Progress & Achievement**

Evaluation methods were properly designed for this purpose to check and verify the ability of trainees in coping with the training system in all parts. Among these are, quizzes, exams, and assignments in additions to a routinely engineering problem solving practices. At the end of each stage (Monthly), a comprehensive report is written and recorded. Other evaluation parameters were considered i.e. performance, team work spirit, time management, seriousness, credibility and ethics. By the end of the 4 months program, a final detailed report on each trainee is documented and presented for discussion with the VE department's director for final results and approval.

**E. Training Program Manual**

VE training & research division tries its effort not to leave any missing gaps or information regarding the training process. Therefore, by designing a full training manual for such a program, trainees will be able to adequately using the 4 months scheduled program.

Figure 4. presents the full contents of the training manual. The main chapters are given, for example, as follow:

- 1- Value Engineering Department
- 2- The Training Program
- 3- The Training Program (Part 1-Theoretical)
- 4- The Training Program (Part 2- Practical)
- 5- Training Process Evaluation
- 6- Pre-Qualification for SAVE Int.

### **SUMMARY**

VE training in Saudi Arabia is becoming increasingly important and as a record 137 VE training seminars, courses and workshops have been conducted till the end of 1998. Moreover, the total number of participants was recorded as 2340 engineers & professionals.

MOMRA training program is proved to be highly effective and did meet Ministry's objectives adequately. Therefore, it is recommended to be performed annually with continuous improvements when it required.

### **ACKNOWLEDGMENT**

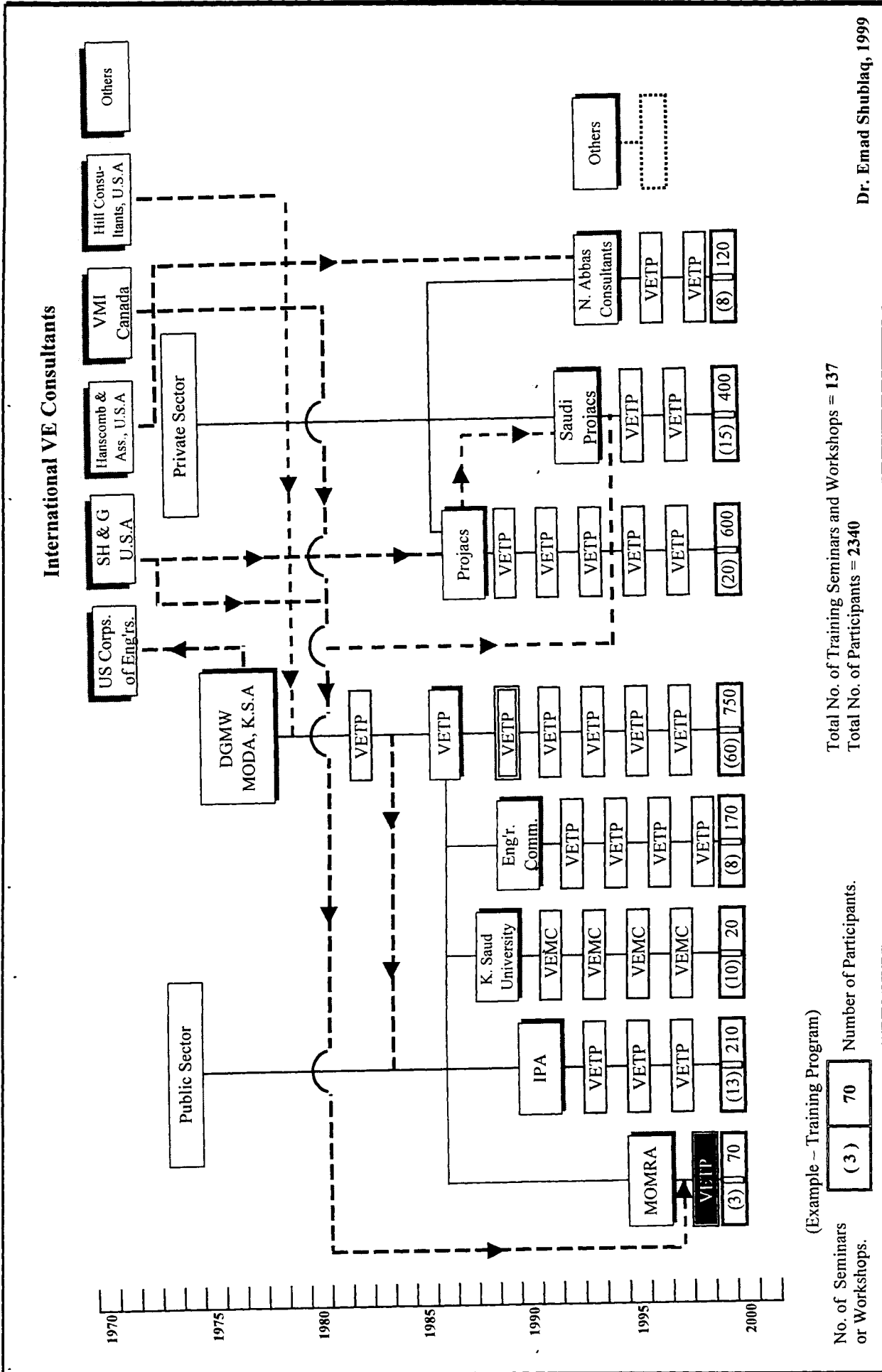
The author wishes to thank the following for their vital assistance in providing information regarding the VE training history:

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- 3- Saleh Al Oshash, 1997, "Value Engineering : Theory & Applications" , Obeikan Publishing Corp. S.A.

Figure 1 : VE Training Roadmap in Saudi Arabia



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Total No. of Training Seminars and Workshops = 137  
Total No. of Participants = 2340

(Example - Training Program)  
No. of Seminars or Workshops. (3) 70  
Number of Participants.

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Figure 2 : F.A.S.T Diagram for MOMRA'S Trainig Program

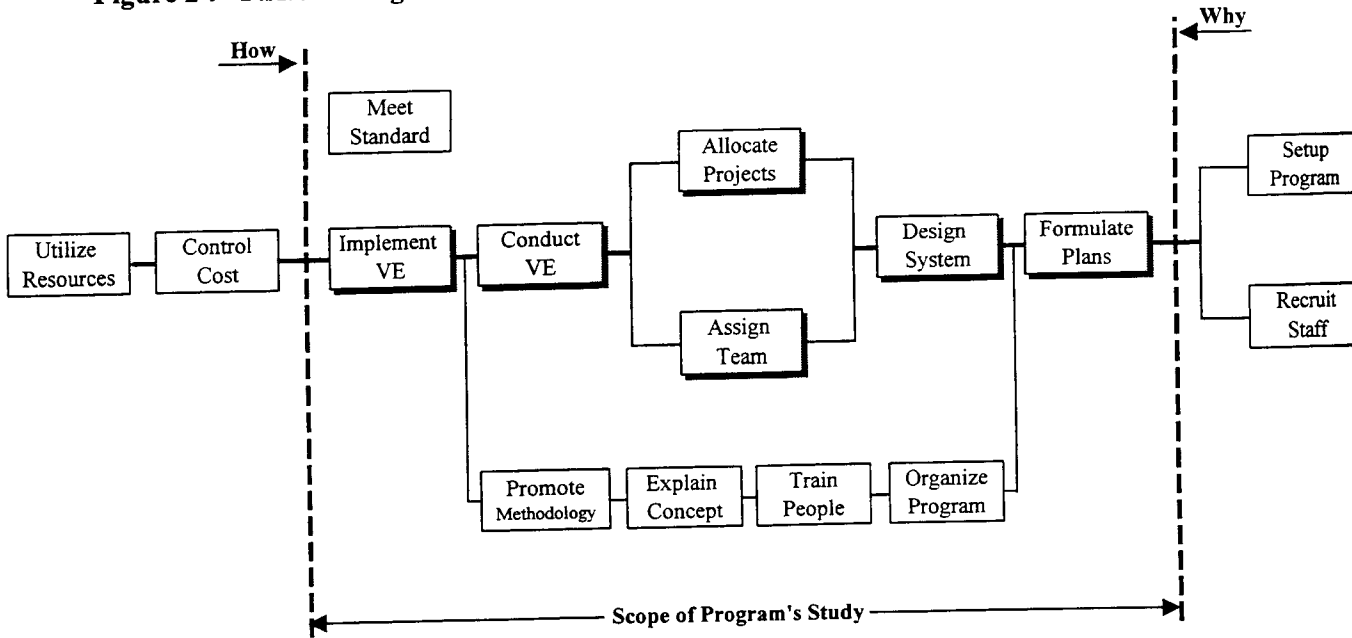


Figure 4 : Illustrates Sample of Training Program Manual

<b>Training Manual</b>	
<b>Preface</b>	
<b>Table of Content</b>	
Chapter- 1:	Value Engineering Department.
1.1	Introduction
1.2	Organization Chart
1.3	Department Divisions
1.4	Value Engineering Division
1.5	Training & Research Division
1.6	Why This Manual ?
1.7	Glossary
Chapter-2:	The Training Program.
2.1	Introduction
2.2	Objectives
2.3	Enrollment & Registration
2.4	Training Staff
2.5	Program's Accreditation
2.6	Program's Content
2.7	Program's Framework
Chapter- 3:	The Training Program (Part I – Theoretical)
3.1	Introduction
3.2	VE Seminars and Courses
3.2.1	VE Theory Seminar (3-day)
3.2.2	MOD-I Course (40 hrs.)
3.2.3	L.C.C Seminar (3-day)
Chapter- 4:	The Training Program (Part II – Practical).
4.1	Introduction
4.1.2	Conducting VE Studies
Stage 1	- Preparation & Information
Stage 2	- Function Analysis
Stage 3	- Idea Generation
Stage 4	- Evaluation and Idea Development
Stage 5	- Proposal and Report Writing
Chapter- 5:	Training Process Evaluation.
5.1	Introduction
5.2	Quizzes & Exams.
5.3	Evaluation Sheets
5.4	Questionnaire
Chapter- 6:	Pre-Qualification for SAVE Int. Membership.
6.1	Introduction
6.2	SAVE International
6.3	Grade of Membership; AVS, VMP, CVS
6.4	Membership Requirements
Appendix :	
1-	Curricula
2-	Exams
3-	Evaluation Sheets
4-	SAVE Int. Application Forms

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TRAINING AND RESEARCH DIVISION

COURSE	PROJECT	7th	WEEKS	VE	VE	VE	
				TRAINEE	Consultant	STAFF	
Intro. to VE			FEBRUARY 98	W 1	Induction	Reception & Welcome	
				W 2	VE Attending	Instructing	
				W 3	Familiarizing with VE	Preparation & Coordination	
				W 4	Familiarizing with VE	Working with Trainees	
MOD-1 Workshop	Project 1 Solid waste management And city cleaning		MARCH 98	M 1	Preparation to Projects	Working with Trainees	
				W 5	Introduction to Project - 1	Preparation & Leading	Preparation
				W 6	Participating in Project - 1	Brainstorming & Evaluation	Brainstorming & Evaluation
				W 7	Attending & Participating	Workshop Instructing	Supervising & Participating
VE Seminar	Project 2 Road maintenance and rehabilitation or Sewage network		APRIL 98	W 8	Finalizing & Reporting	Finalizing & Reporting	
				W 9	Preparation to Project - 2	Leading & Performing	Preparation
				W 10	Participating in Project - 2	Leading & Performing	Brainstorming
				W 11	Participating in Project - 2	Leading & Performing	Development
			MAY 98	M 3	Attending	Instructing	Supervising
				W 12	Finalizing & Presentation	Leading & Performing	Finalizing & Presentation
				W 13	Graduation Research Assignment		Supervising
				W 14	Finalizing Reports		Wrapping Project Reports
			MAY 98	M 4	Application SAVE / AVS	Supervising SAVE Application	
				W 15	Graduation & Farewell Party	Grad. Party	
				W 16		Close-out	

Figure 3 : FLOW MODEL FOR MOMBASA ANNUAL TRAINING PROGRAM

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DEPARTMENT OF VE