

Introducing Superimposed F.A.S.T in Privatization Decision Making

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ABSTRACT

In this paper, value engineering approach is used as a vital tool in contributing to Privatization (private participation) transactions in Saudi Arabia. The application of VE is presented here in by integrating business process re-engineering and privatization processes of Sea water desalination. As a result, a decision making approach is demonstrated and a superimposed F.A.S.T, may be for the first time, is introduced.

INTRODUCTION

Governmental officials in Saudi Arabia have recently decided to go for private participation transactions, or what we call, "Privatization" of major operations such as water, electricity, solid waste, and communication services. Although Saudi Arabia is considered to be one of the major player in "OBEC" organization and hence had an advantages of oil price soar. However, it is strongly believed that public organizations and institutions performance and quality are severely criticized. This paper explains how value engineering methodology improves the way of thinking of the decision and policy makers in water authority to adopt the privatization transaction strategy through

a business process re-engineering approach. Simply, no one will go for such investment without greater assurance of profitable entity. Moreover, the paper, in its content, focuses on three major parts; the desalination process and its implementation, then the privatization transactions and finally how (VM) can utilize the link between privatization transaction and the business process re-engineering (BPR) for the same case study.

Accordingly, this paper, perhaps, for the first time, presents what I called here, a superimposed F.A.S.T diagram in which demonstrated, together, the privatization transaction and BPR processes integration in which supported decision making approach and had elaborated on the big picture for policy makers and top management at the organization.

DESALINATION: A TREATMENT PROCESS

Desalination (Desalting) refers to a water treatment process that removes salts from water. Desalting can be done in a number of ways, but the result is always the same: Fresh water is produced from brackish or sea water. Desalting technologies can be used for a number of applications.

However, this paper intends to focus on using such technology or process to produce potable water from saline water for domestic or municipal purposes.

Throughout history, people have certainly tried to treat salty water so that it could be used for drinking and agriculture.

According to Buross (1990), from International Desalination Association, of all the globe's water, 94 percent is salt water from the oceans and the remaining 6 is fresh. Of the latter, about 27 percent is in glaciers and 72 percent is underground.

The application of desalting technologies over the past 50 years has changed in many places. This change has been very noticeable in parts of the arid Middle East, North Africa and some of the islands of the Caribbean, where the lack of fresh water severely limited development.

THE DEVELOPMENT OF DESALTING

Desalting is a natural, continual process and an essential part of the water cycle. Rain falls to the ground then flows to the sea, and people use the water for various purposes as it makes this journey.

A major step in development came in 1940's, during World War II, when various military establishments in arid areas needed water to supply their troops. The American government, through creation and funding of the office of saline water (OSW) in the early 1960's and its successor organizations like the office of water research and technology (OWRT), made one of the most concentrated efforts to develop the desalting industry.

By the late 1960's, commercial units of up to 8,000 cubic meters per day (2 million US gallons) per day (mgd) were beginning

to be installed in various parts of the world. These mostly thermal-driven units were used to desalt sea water, but in the 1970's, commercial membrane process such as electro dialysis (ED) and reverse osmosis (RO) began to be used more extensively.

By the 1980's and 1990's, desalination technology was a fully commercial enterprise and hence used for municipal water supplies.

The inventory indicates (1998 IDA inventory) that the world's installed capacity consists mainly of the multi-stage flash distillation and reverse osmosis. These two processes make up about 86 percent of the total capacity. The remaining 14 percent is made up of the multiple effect, electro dialysis, and vapor compression process, while the minor processes amounted to less than one percent.

DESALTING TECHNOLOGIES

In a simple way, a desalting device (Figure 1) essentially separates saline water into two streams; one with a low concentration of dissolved salts (the fresh water stream) and the other containing the remaining dissolved salts (the concentrate or brine stream).The device requires energy to operate and can use a number of different technologies for the separation .

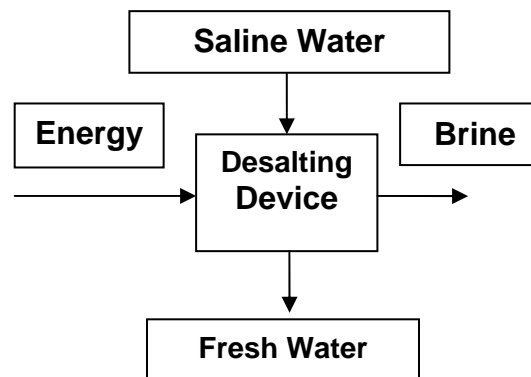


Figure 1 : Desalting Device Process

While it is not the paper's scope or objective to discuss in details the desalination process's merits and demerits for each methods (further readings can be found at related literature), the following major and minor methods are listed below as :

- Major Processes
- 1- **Thermal**
 - 1.1.1 Multi-Stage flash distillation
 - 1.1.2 Multiple-Effect distillation
 - 1.1.3 Vapor Compression
- 2- **Membrane**
 - 2.1 Electro dialysis
 - 2.2 Reverse Osmosis
- Minor Processes
- 3- Freezing
- 4- Membrane distillation
- 5- Solar Humidification

WHY PRIVITIZATION?

Private participation in infrastructure had moved to the top of the political , economical , and social agenda of a growing number of countries. The focus of debate is beginning to shift from **WHY** to **HOW** , filling the demand for lessons on best practices in reform strategies, regulatory framework , institutional arrangements and risk mitigation. For policy makers, private investors and consumers alike, the key challenge is to use the lessons of positive and negative experience in other countries and sectors in devising arrangements for private participation in infrastructure that are fair , predictable, and sustainable and , above all that deliver better services and greater efficiency.

In Saudi Arabia, the privatization program had strongly begun to overcome a great number of challenges the government is lately encountered. Water authority , in particular , is in a tremendous criticized situation where water quality , customer services, staff performance and regulation are among many

Barriers to fulfill user's desires and needs.

The paper is primarily focuses on water demand and supply status in Saudi Arabia in which suggests releasing the government dominance and permit private participation. The country is heavily relies on Sea water desalination and the policy makers have realized the high cost of such option. However, Figures 2 and 3 show the high consumption of water at GCC countries and its comparison with the rest of the world.

VALUE ENGINEERING AND DECISION MAKING

Tables 1and 2 show the high cost of sea water desalination in Saudi Arabia. Therefore , government officials are adamant to take the following major steps :

1. Reduce cost (target by 50%) or T50.
2. Invite private sector to participate or take over (management, operation, or even ownership of plants) into infrastructure projects.

VE JOB PLAN

Basically, the above challenge of the government is examined by integrating VE Job Plan & Problem Solving Technique (PST), (Figure 4). Accordingly , VE staff work closely with client's top management to clearly understand the problems / challenges which appears in the following statement :

"How can we make the organization profitable before we handed over to the private sector"?

In VE job Plan , the team leader essentially focus on the function analysis of the following (2) major challenges :

1. Business Process Re-engineering (BPR).

2. Privatization Process (PP).

In order to achieve our target by reducing the water consumption and then cost by almost 50%. The mission / assignment is called (T50) and its objective is to lower cost by almost 50% without sacrificing the quality and performance of staff.

THE START : INFORMATION PHASE

The existing challenges which encountered the VE team leader is the following :

- The increase annual growth of population (Recently , 22.7 million) ,
- The increase of daily demand of water (300 L³ / person/day)
- Limited government budget for such a sector (2003-2004) , and
- Limited resources options (Desalination, under ground wells, etc).

The remaining information and data are collected as :

- There has been 30 Desalinations Plants all over the kingdom ,
- There has been 2.9 million m³ of the drinkable water produced daily ,
- There is a 3400 mega watt power produced / and ,
- There are 12 water distribution pipe channel / lines.

THE ESSENCE : FUNCTION ANALYSIS & SUPERIMPOSED F.A.S.T

To make any privatization transaction useful a business process re-engineering technique / approach is utilized especially if the government sector is not performing satisfactory.

Accordingly , 2 FAST diagrams were presented , the first one for business process re-engineering (figure 5) and then followed by the 2nd one for privatization process (figure 6). As a decision making approach , the 2 F.A.S.T are combined together and integrated to

become one superimposed F.A.S.T which presents the whole big picture for the policy makers and top management officials (figure 7). The new F.A.S.T, successfully, presents the followings :

- 1- The scope lines of both studies (BPR & PP) ,
- 2- The lower order functions ,
- 3- The higher / strategic , decision making , order functions ,
- 4- The basic functions for (BPR&PP) , and
- 5- The critical path line for the studies.

THEN : IDEA GENERATION & DEVELOPMENT

Out of brainstorming session and Delphi technique, a large number of ideas were listed and then evaluated. The developed ideas covered the following items :

- 1- Desalination Plants :
 - Capacity , type , location , and feeding water ,
- 2- Distribution Channels :
 - Lengths , type , route , components , anti corrosion process , inside lining ,
- 3- Desalination Technologies :
 - Thermal Treatment
 - Membrane Treatment
 - Others, Freezing, etc.
- 4- Spare parts
- 5- Research & Development (R&D)
- 6- Labor , Training , and pre-qualification
- 7- Privatization transaction :
 - Management Contracts
 - Leasing
 - Selling
 - Financing, B.O.O, B.O.T, B.O.O.T, etc.

FINALLY :THE PRESENTION

Often, all developed ideas are summarized and then presented to the Owner / Client. Although the same procedure is used , as for all VE

studies, the function analysis tactics was slightly different, this time, where a newly thinking approach was introduced to enhance the value of the project.

THE CONCLUSION

We shall always remember as VE consultants and professionals that function analysis is the heart of the value methodology. In our study herein, the creativity thinking was allowed to introduce the integration of problem solving technique and value methodology job plan (5steps×5steps). As a result, the (VM) facilitator /team Leader had the ability to man-oeuvre and suggest what ever is adequate to serve the project throughout enhancing quality and performance and then reducing the cost. This was achieved successfully by introducing a superimposed F.A.S.T in our case study above. The basic advantage of that is the following :

- 1- Enables VE team Leader / facilitator to play actively in a creative way of thinking.
- 2- Enable team members to oversee the problem openly with fewer constraints.
- 3- Enables decision makers to concisely review the goals of the project.
- 4- To encourage team members and other parties involved to utilize VE as a powerful tool in achieving the best functional balance.

REFERENCES

- 1- Burous, O, K, "ABC Desalination", International Desalination Association, 1990, USA.
- 2- Saudi Water Authority, Riyadh news paper, 2003.
- 3- International Desalination Inventory 1998, USA.

Water supply & demand

Saudi Water Authority - 2003

Category	Actual	Targeted
Water consumption rate per person	300 liter /day	150 liter / day
Daily wanted water	7.2 million cubic meter	3.6 million cubic meter
Daily available water	5.7 million cubic meter	5.7 million cubic meter
Daily Deficit	1.5 million cubic meter	
Daily surplus		2.1 million cubic meter

Table 1 : Water supply & demand
Saudi Water Authority - 2003

Water overall cost – Saudi Ministry of Water (2003 – 2022)

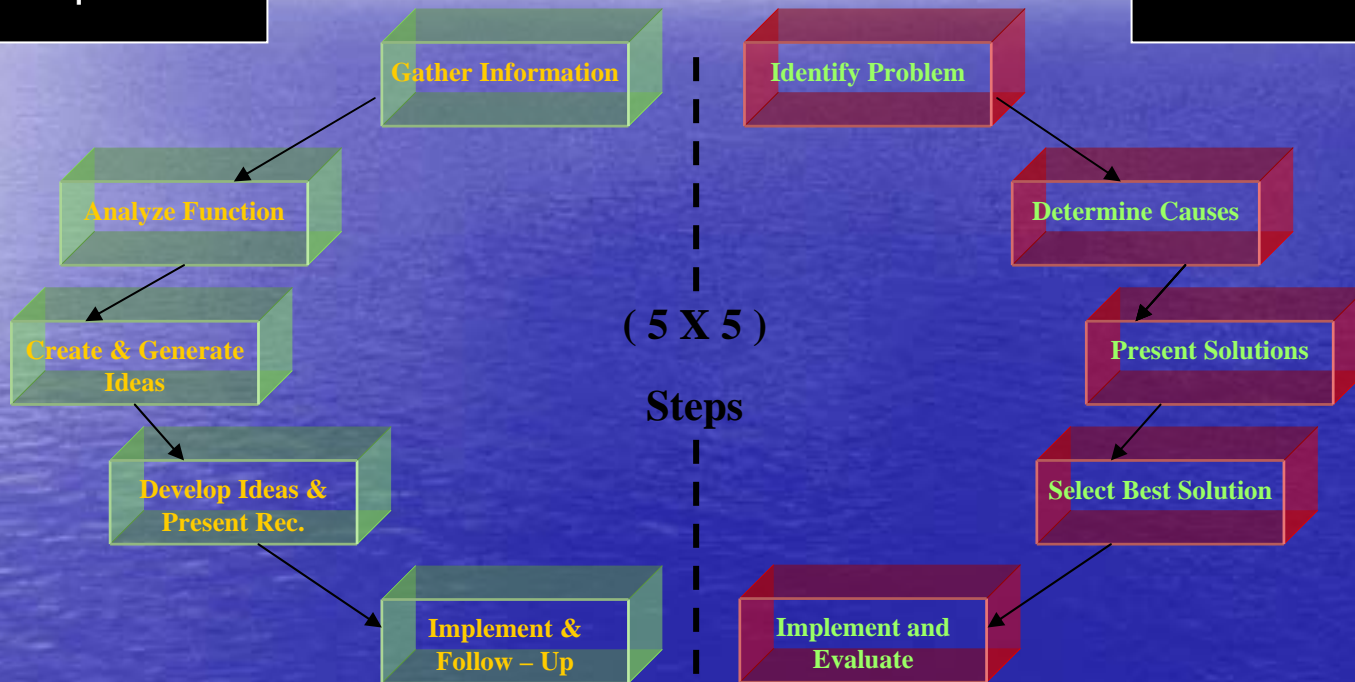
Year	As per consumption of 300 L/day/person		As per consumption of 150 L/day/person	
	Daily wanted (1000)-m3	Annual Total Cost (1000)	Daily wanted (1000)-m3	Annual Total Cost (1000)
2003	7,219	16.919.139	3,610	6.683.570
2007	8,061	18.365.133	4,031	7.853.452
2012	9,143	21.826.998	4,571	10.364.717
2017	10,259	23.789.029	5,130	11.745.341
2022	11,388	26.371.524	5,694	13.078.102
Total		423.616.824		204.185.555
Ave. (Ann.)	9,273	21.180.841	4,637	10.209.278

Table 2 : Water overall cost – Saudi Ministry of Water (2003 – 2022)

Integration of VE & PS Techniques

Value Engineering
Technique

Problem Solving
Technique



The Decision – Making Approach

Figure 4: Integration of VE & PS Techniques

Daily water consumption – worldwide (per person / cubic meter)

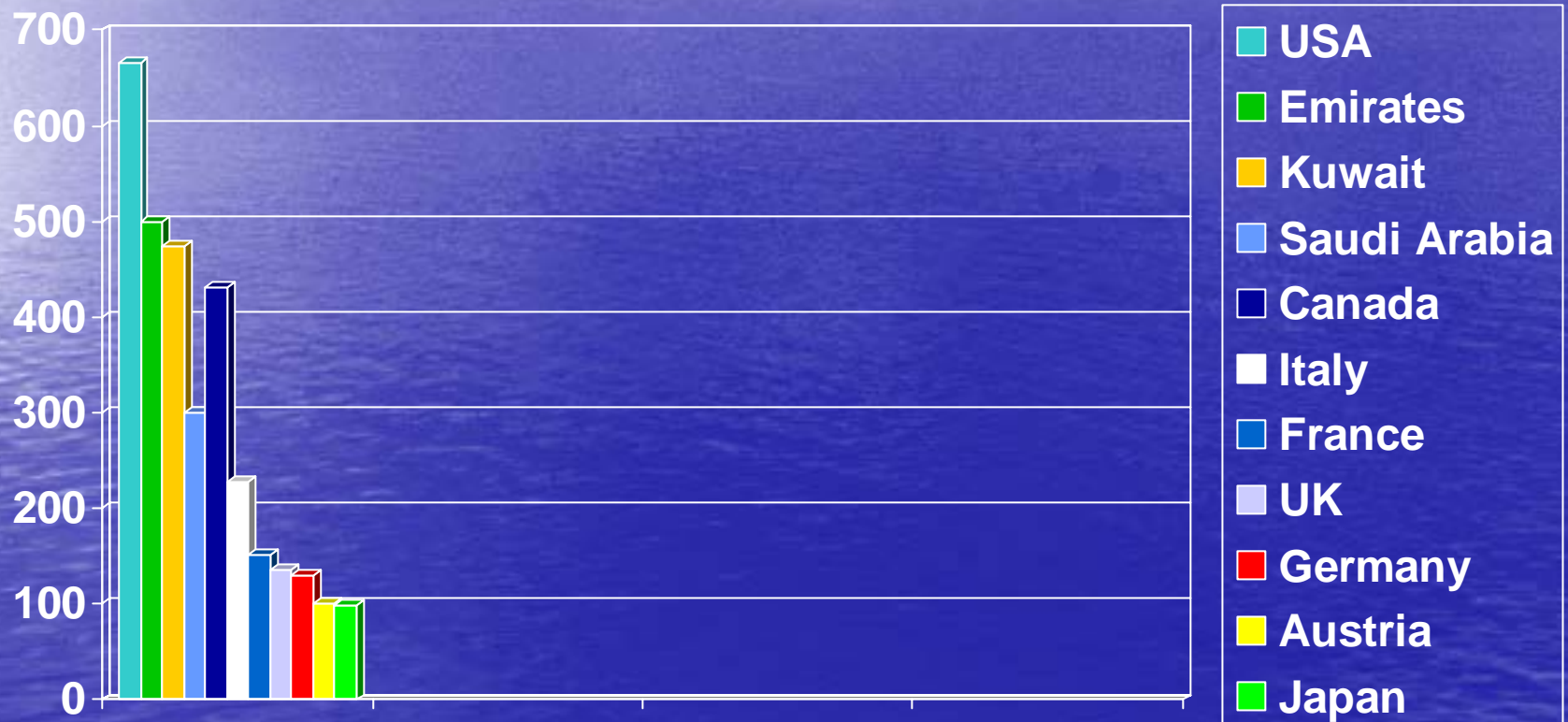


Figure 3: Daily water consumption – worldwide
(per person / cubic meter)

Desalination Production among the GCC Countries

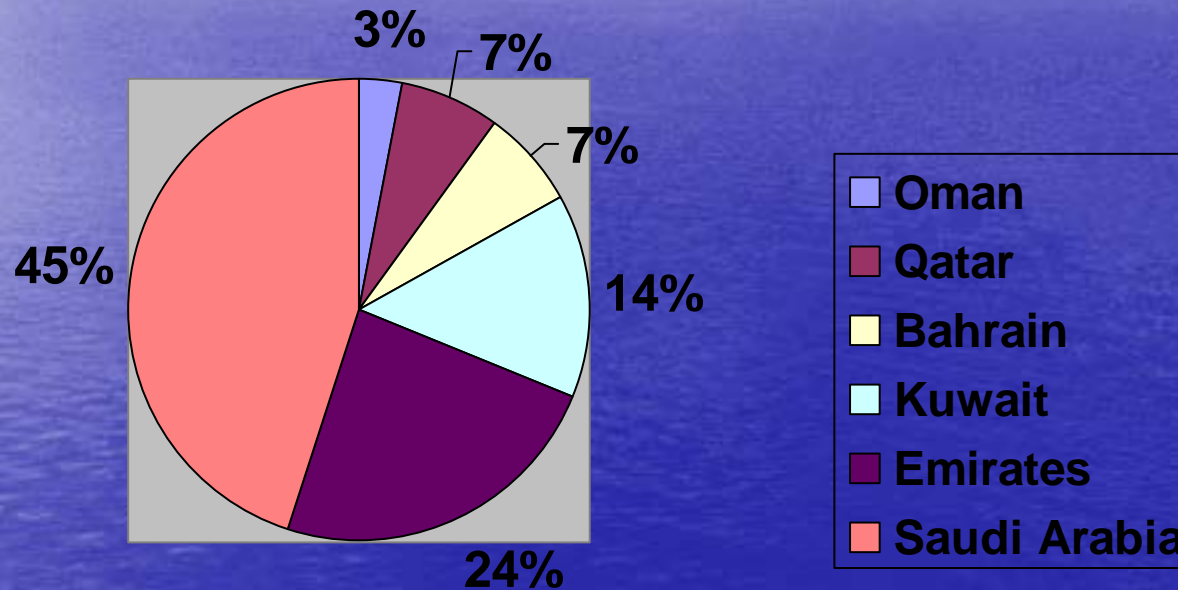


Figure 2 : Desalination Production among the GCC Countries

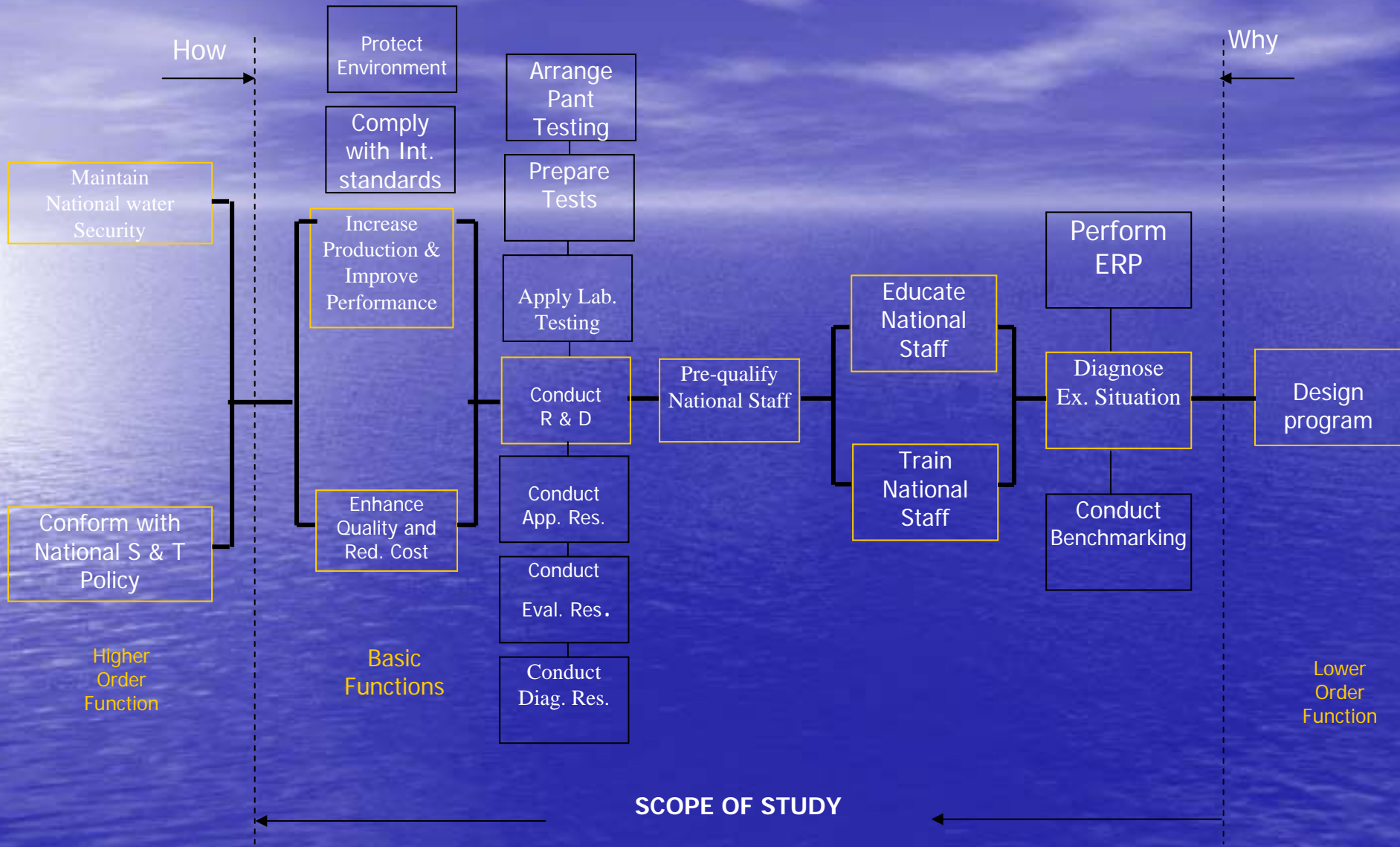


Figure 5 : F.A.S.T Diagram For Process Re-engineering - SWCC

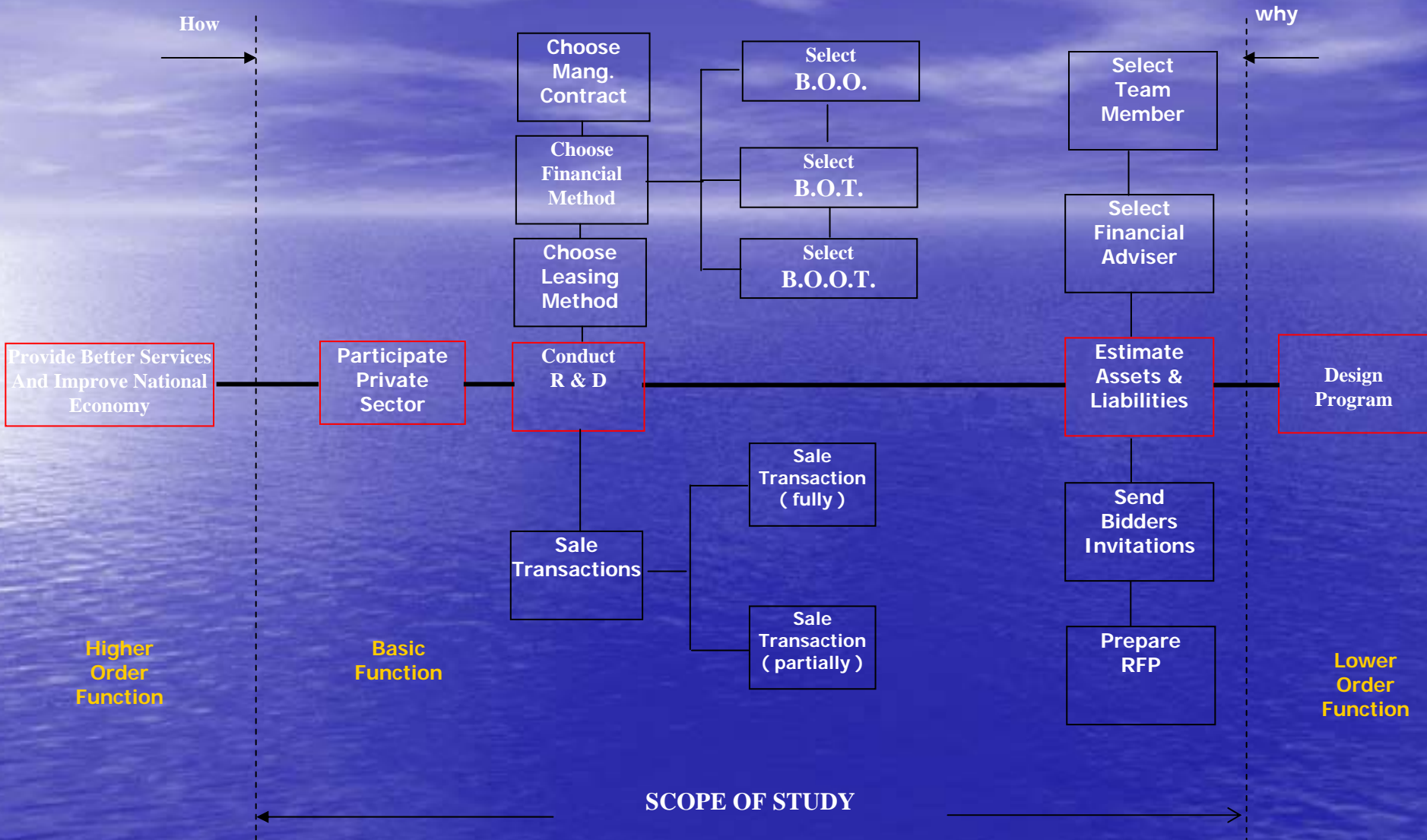


Figure 6 : F.A.S.T Diagram For Privatization - SWCC

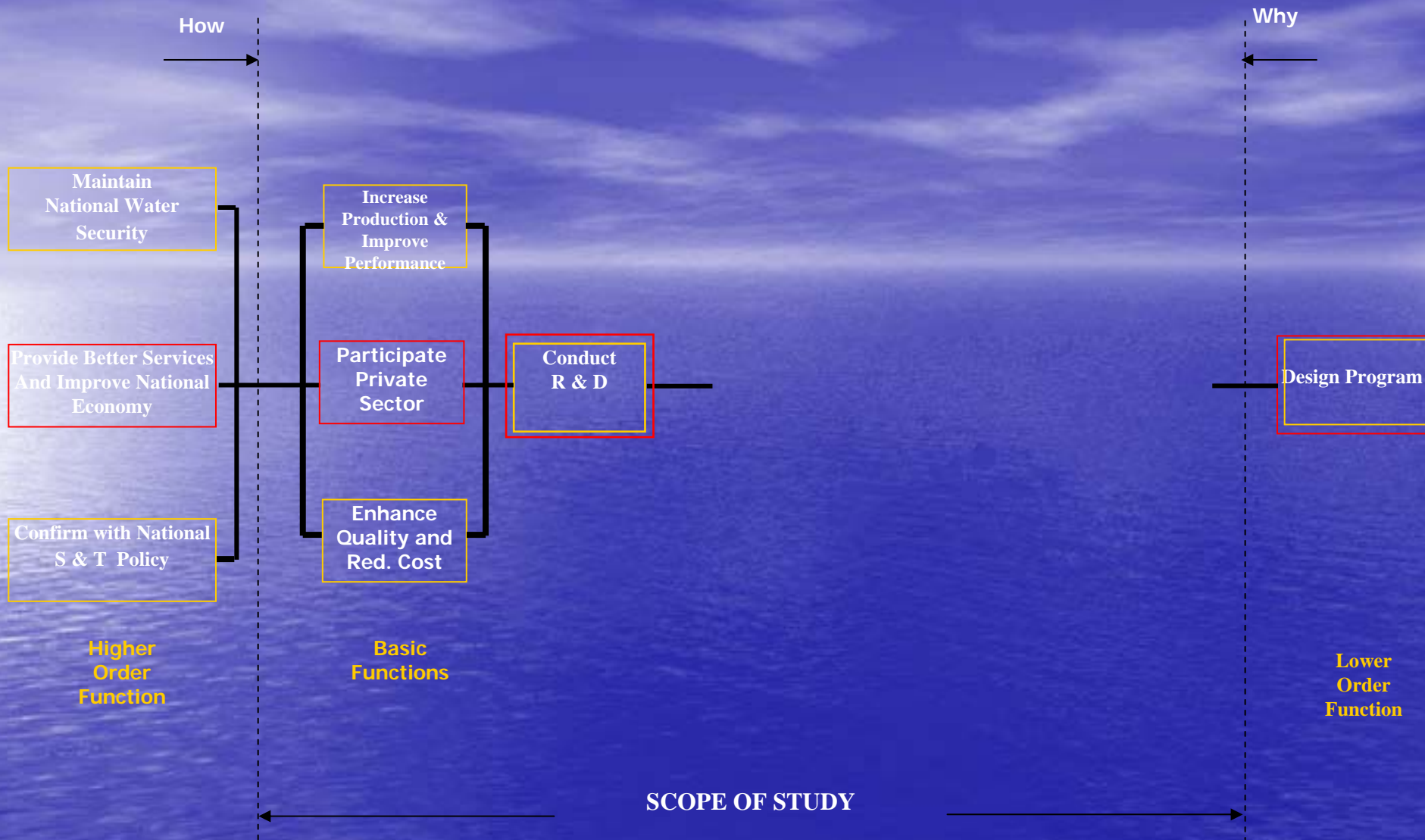


Figure 7 : SUPERIMPOSED F.A .S.T For Re-engineering & Privatization