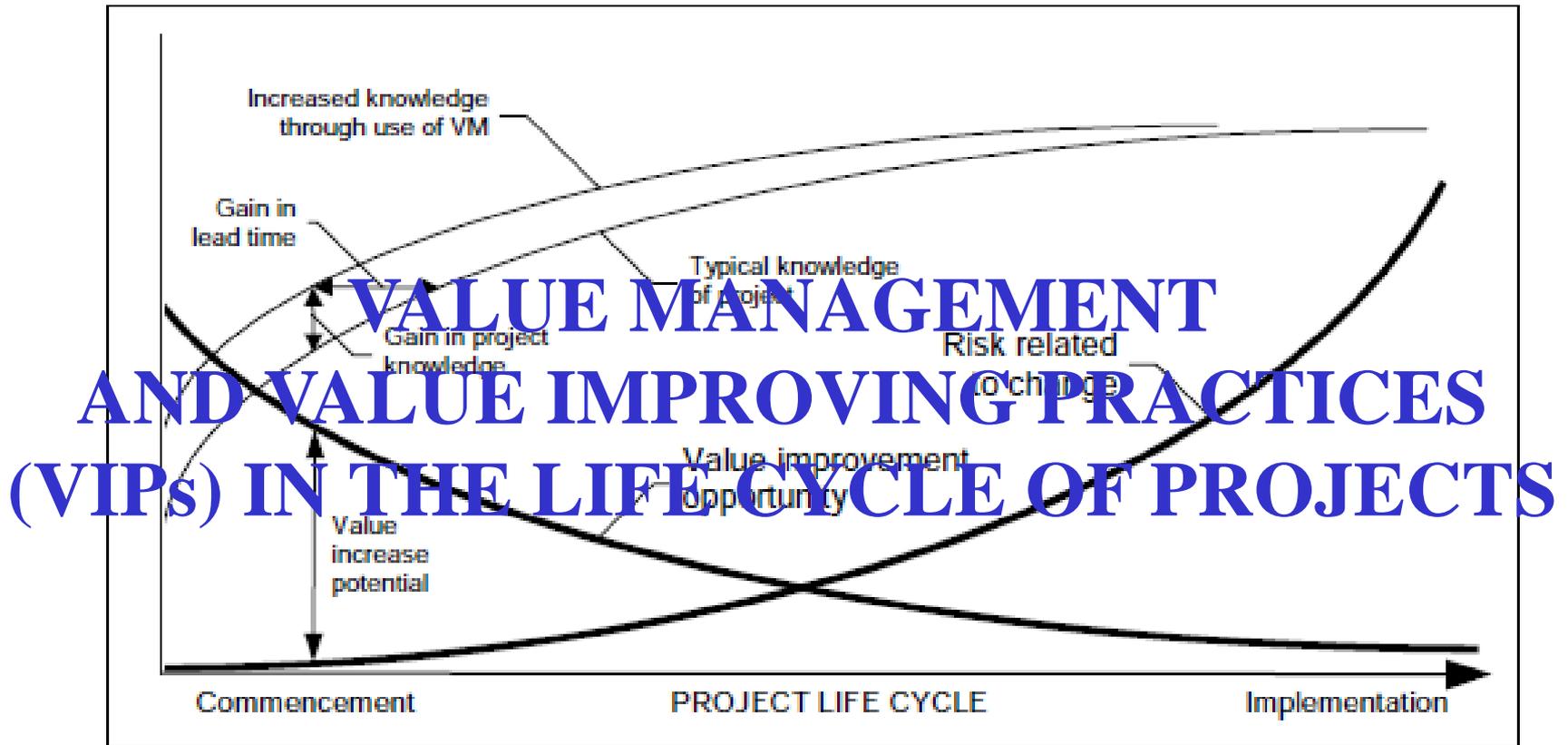


# SCAF WORKSHOP 2014



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# THE CONCEPT AND PRACTICE OF VALUE MANAGEMENT (1)

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Stephen Simister takes into consideration *'the concept of value and how it is produced by the functionality of the facility delivered by the project'* (from the Gower Handbook of Project Management).

Simister also identifies Value Management as *'primarily concerned with ensuring that the client's needs are clearly defined and that a true scope of work is produced for the project such that the value a project will provide is defined'*.

# THE CONCEPT AND PRACTICE OF VALUE MANAGEMENT (2)

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Additionally, in his book *Construction Cost Management*, Keith Potts states the following:

*‘Value management is the wider term used in the UK to describe the overall structured, team-based approach to a construction project.*

*It addresses the value process during the concept, definition, implementation and operation phases of a project.*

*It encompasses a set of systematic and logical procedures and techniques to enhance project value throughout the life of the facility’.*

# **THE CONCEPT AND PRACTICE OF VALUE MANAGEMENT (3)**

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These assertions provide an excellent introduction to the subject of Value Management in the life cycle of projects.

Further insights will be provided in the book

**Project Life Cycle Economics - Cost Estimation, Management and Effectiveness in Construction Projects**

(ISBN: 978-1-4724-1964-4) edited by Massimo Pica, to be published by Gower in 2015.

# THE CONCEPT AND PRACTICE OF VALUE MANAGEMENT (4)

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Some peculiarities of projects

- only one time establishment
- big investment scale
- complicated structure
- high energy consumption in operation processes

make the cost management theories and methods of projects

different from other general products.

# THE CONCEPT AND PRACTICE OF VALUE MANAGEMENT (5)

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Value management can be efficiently applied to the total life cycle of projects, considering also function analyses in investment decision stages and combining cost management methods such as supply chain management and Kaizen costing based on objective cost management in implementation stages, in order to realise the value of projects while minimising life cycle costs.

# THE CONCEPT AND PRACTICE OF VALUE MANAGEMENT (6)

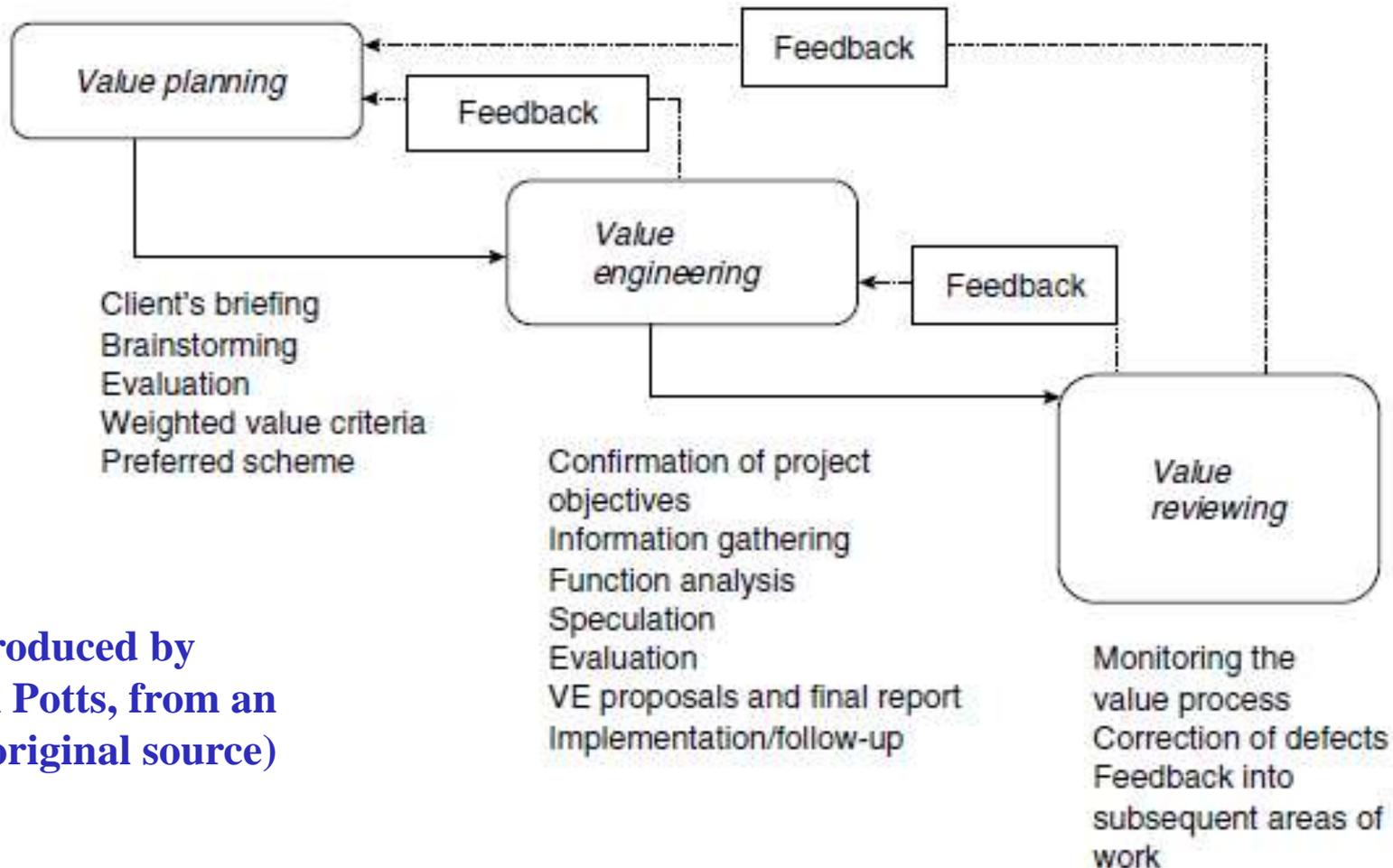
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*Value management* aims to add value to projects in terms of time, cost and quality. It maximises the functional value of a project by managing its life cycle until the beginning of utilisation stage.

*Value engineering* is a part of value management which considers specific aspects of the design, construction, operation and management of assets.

# THE CONCEPT AND PRACTICE OF VALUE MANAGEMENT (7)

## Value management process



(Reproduced by  
Keith Potts, from an  
ICE original source)

# **THE CONCEPT AND PRACTICE OF VALUE MANAGEMENT (8)**

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## **Economic Value Added (EVA).**

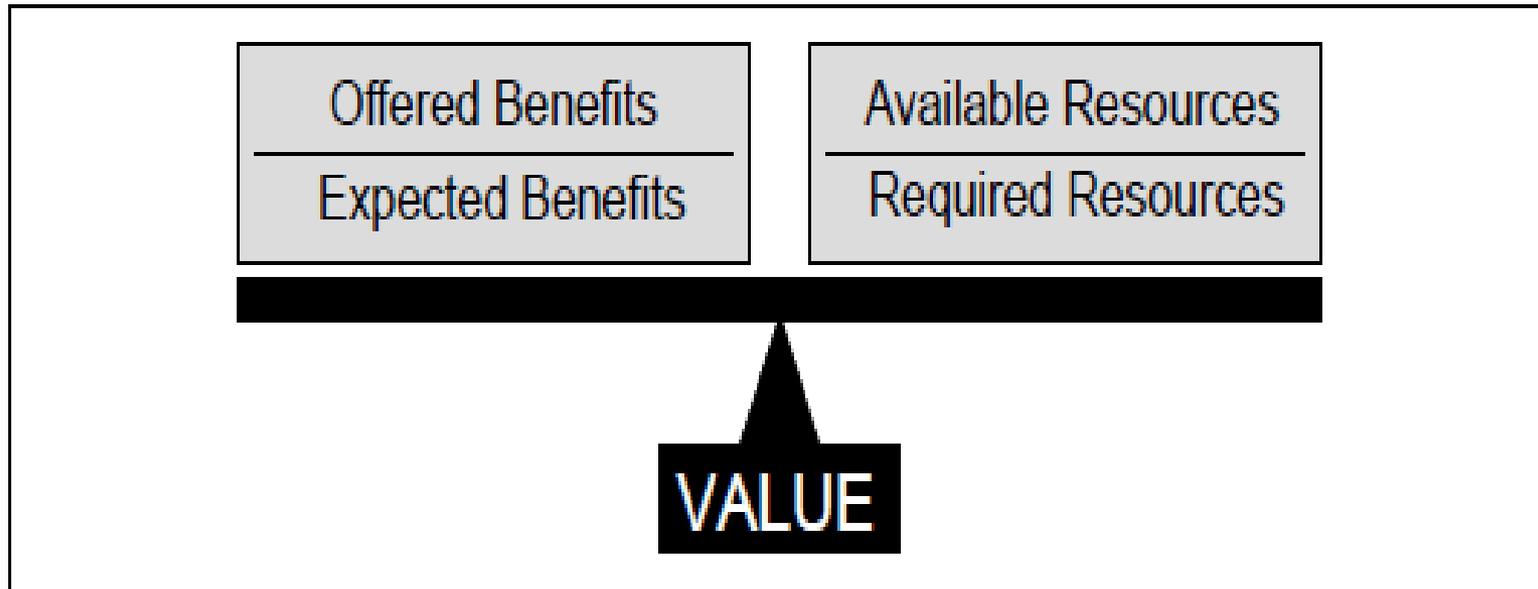
The EVA figure is the difference between the profit made by a company and the cost of its capital.

Companies make a profit from their business and have to cover the cost of their capital. Should the cost of capital (plus a reasonable margin) not be covered, it would have been better if the investor's money had been placed elsewhere, or if a new management team were brought in.

# THE CONCEPT AND PRACTICE OF VALUE MANAGEMENT (9)

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Value will be realized only if the resources available are equal to or greater than the required resources and if the benefits offered are greater than or equal to the expected benefits. This concept is summarized in the figure.



# THE CONCEPT AND PRACTICE OF VALUE MANAGEMENT (10)

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**Workshops** are organized to enable stakeholders to participate in defining and achieving their needs.

**Issues to be considered:** clearly defined objectives of the project, the various alternatives and the choice of the correct one, health and safety, sustainability, design quality, buildability, operation/ maintenance and disposal.

# THE CONCEPT AND PRACTICE OF VALUE MANAGEMENT (11)

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## Main purposes of Value Management (part 1):

- Establish what value means to the customer,
- Identify and agree business needs
- Identify and evaluate options (including PFI) for meeting business needs
- Select and agree the best option to meet business needs
- Define and agree the project objectives

# THE CONCEPT AND PRACTICE OF VALUE MANAGEMENT (12)

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## Main purposes of Value Management (part 2):

- Select and agree the best project option
- Set and weigh the selection and award criteria for the appointment of the integrated supply team
- Evaluate the bids against the selection and award evaluation criteria
- Refine the design to maximise value

# **THE CONCEPT AND PRACTICE OF VALUE MANAGEMENT (13)**

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## **From Value Management to Value Engineering:**

Value engineering follows a series of steps in order to determine the most promising options or proposals, beginning from the identification of:

- the business problem,
- the customer needs and priorities,

and, subsequently, of

- the most promising options from the last stage, which next are developed and appraised.

# **THE CONCEPT AND PRACTICE OF VALUE MANAGEMENT (14)**

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## **Benefits of Value Engineering approach:**

- Simple, clear definition of stakeholders needs,
- Identification and analysis of all alternatives and the correct option to be considered,
- Proposing how value for money can be achieved,
- Proposing means to reduce waste and inefficiency and therefore prevent unnecessary expenses, and
- Improved team working with joint ownership of solutions.

# RISK IMPLICATIONS IN VALUE MANAGEMENT (1)

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The general concept of **risk** in project management involves **uncertain outcomes**, whether **positive opportunity** or **negative impact**.

Some amount of risk taking is **inevitable**, whatever the project. a deliberate **acceptance** of some degree of risk is implied.

# RISK IMPLICATIONS IN VALUE MANAGEMENT (2)

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Risk management for projects encompasses the activities listed below:

- Identifying and assessing the risks in terms of impact and probability
- Establishing and maintaining a joint risk register, agreed by the integrated project team
- Establishing procedures for actively managing and monitoring risks throughout the project and on completion

# RISK IMPLICATIONS IN VALUE MANAGEMENT (3)

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(continues from the foregoing list of Risk management activities):

- Updating risk information throughout the life of the project
- Ensuring control of risks by planning how risks are to be managed through the life of the project to contain them within acceptable limits
- Allocating responsibility for managing each risk with the party that is best able to do so.

# RISK IMPLICATIONS IN VALUE MANAGEMENT (4)

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Management of risk is a **systematic and continuous process** throughout the life of projects.

Risk management plans should be in place early enough to **control risks quickly and effectively** if they arise.

Risks should be **allocated to individual risk owners** within the integrated project team, who should fully understand the risks for which they are responsible.

# RISK IMPLICATIONS IN VALUE MANAGEMENT (5)

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The risks should be managed actively throughout the life of the project in accordance with a risk management plan which should deal with all risks, whether retained by the client or transferred to others in the integrated project team.

The business case should include a time element and the risks of that changing should be kept constantly under review.

# RISK IMPLICATIONS IN VALUE MANAGEMENT (6)

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The **risk register** is the typical document used to record the above information. It should be maintained collectively by the integrated project team and regularly updated throughout the project life cycle, as risks will be constantly changing. Risk management plans may be recorded on the risk register.

The **key intentions of risk management** are to ensure that risks are identified at project inception, their potential impacts allowed for and, where possible, the risks or their impacts minimized.

# RISK IMPLICATIONS IN VALUE MANAGEMENT (7)

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Risk management involves several stages, namely:

- Risk identification – to determine what the risks are
- Assessment of risks – to determine the probability of occurrence and potential impact or severity
- Taking appropriate remedial actions
- Monitoring, updating and controlling risks
- Feedback on how well risks were managed and lessons learned.

# RISK IMPLICATIONS IN VALUE MANAGEMENT (8)

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## Risk response

The *management actions* that may be taken include:

- Avoidance
- Reduction (including elimination)
- Transfer
- Retention/acceptance

# RISK IMPLICATIONS IN VALUE MANAGEMENT (9)

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## Avoidance

Where risks have such serious consequences on the project outcome that make them totally unacceptable, measures might include a review of the project objectives and a re-appraisal of the project which may lead to the replacement of the project, or its cancellation

# RISK IMPLICATIONS IN VALUE MANAGEMENT (10)

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## Reduction

(including elimination)

Typical action to reduce risk that can take the form of redesign, more detailed design or further investigation to improve the information on which estimates and programmes are based

# RISK IMPLICATIONS IN VALUE MANAGEMENT (11)

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## Transfer

Involvement of a different member of the integrated project team, who would be responsible for the consequences should the risk occur. The object of transferring risk is to **pass the responsibility** to another party that would be better able to manage it

# **RISK IMPLICATIONS IN VALUE MANAGEMENT (12)**

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## **Retention/acceptance**

Risks that are not transferred or avoided are retained by the client although they may have been reduced or shared.

A 'do-nothing' approach is unacceptable. Even when risks have been transferred, the customer still needs to track management of the risk.

# VALUE IMPROVING PRACTICES IN THE LIFE CYCLE OF PROJECTS

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## Summary of main VIPs:

- VIPs in Life Cycle Cost and Value Management
- Facility Quality VIP
- Technology Selection VIP
- Process Simplification VIP
- Constructability VIP
- Predictive Maintenance VIP
- Waste Minimization VIP

# VIPs in Life Cycle Cost and Value Management (1)

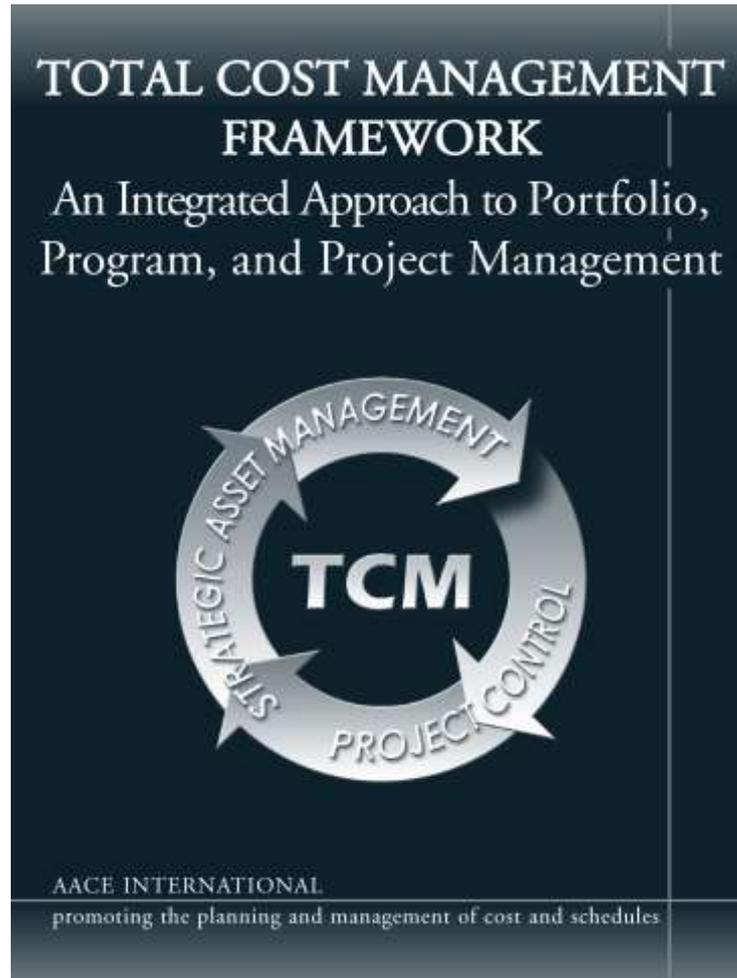
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Value Improving Practices (VIPs) are structured solutions that can be applied to enhance the value, or profitability, of projects – especially capital projects – in comparison to the application of less profitable, more traditional engineering and project management practices.

VIPs analyze project characteristics and features that are achieved at recognized optimum times during the life cycles of capital projects.

# VIPs in Life Cycle Cost and Value Management (2)

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# VIPs in Life Cycle Cost and Value Management (3)

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The AACEI's Publication *Total Cost Management Framework* states that:

*Generally, VIPs should consider cost over the life cycle of the asset and project (...) because the ultimate goal of most enterprises is long term profitability. VIPs must also be used in the early design and planning phases because the ability to influence value diminishes rapidly as scope definition and design progress.*

# VIPs in Life Cycle Cost and Value Management (4)

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The same AACEI's Publication quotes the sentence written in 1989 by the authoritative founder of the correlated disciplines of Value Analysis and Value Engineering, *Lawrence D. Miles*, who stated in his *Techniques of Value Analysis and Engineering* that *the best value is determined by two considerations: performance and cost.*

# VIPs in Life Cycle Cost and Value Management (5)

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Correspondingly, the *Total Cost Management Framework* asserts the following:

*This statement recognizes that owners rarely are willing to pay any cost for performance and if owners can get the performance at no cost, they will almost certainly be most satisfied. However, very little is free, and in a competitive environment, the goal is usually to obtain equal or better performance at a lower cost than before and at a lower cost than the competition in consideration of risk.*

# VIPs in Life Cycle Cost and Value Management (6)

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Applications of VIPs to capital projects have been statistically demonstrated to markedly enhance project profitability.

The term *Best Practical*, or *Best in Class*, identifies the highest performing (upper 20 per cent) projects.

When process efficiency is combined with rigorous applications of VIPs, project cost performance improvements can be expected, in terms of capital cost reductions, allegedly up to 20 per cent.

# VIPs in Life Cycle Cost and Value Management (7)

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Several classes of VIPs can affect capital project profitability above the level that can be reached by the project team on its own.

Each VIP may have a different purpose and focus, primarily the following: facility quality, technology selection, project process simplification, constructability, predictive maintenance, waste minimization.

The most appropriate VIPs to be applied to a specific project are selected during a VIP planning session, taking place right after the project kick-off.

# VIPs in Life Cycle Cost and Value Management (8)

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Cost, schedule and/or performance of capital projects are improved, as reflected in VIPs, using specific non-traditional practices.

VIPs are essential during preliminary project stages.

On the other hand, VIPs are **none** of the following: merely ‘good engineering practices’; simple brainstorming sessions or strategy sessions; ‘business as usual’; cost reduction/scope reduction exercises; project readiness/design reviews.

# Facility Quality VIP

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In this class of VIPs, the highest value or profitability is determined (not exclusively) in terms of: capital investment; planned facility life; expandability; operating costs; environmental controls.

This VIP is used to confirm the best overall project philosophy and to incorporate overall risk concepts in the facility design and operation.

The outputs of this VIP assist the project management team in updating the project execution plan. In order to best achieve this purpose, this VIP should be preferably performed in advance of any further VIP effort in the early timeframe of the project.

# Technology Selection VIP

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The purpose of this VIP is to apply evaluation criteria in accordance with the business objectives of the project, in order to identify more effective technologies compared to the current ones and consequently to select the most competitive technological solution.

The class of Technology Selection VIP provides the best results when conducted in the initial phase of the project.

# Process Simplification VIP (1)

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The primary objective of this VIP is to optimise the project implementation process, so as to ensure the right balance of schedule constraints against the expected facility operability and overall life cycle costs, mainly resulting in the reduction of both investment and operating costs.

# Process Simplification VIP (2)

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In more detail, the objectives of this VIP are the following:

- Reduction of capital costs
- Improvement in project critical path schedule
- Higher process effectiveness
- Reduction of follow-up lifetime costs (specifically, operating and maintenance costs)
- Increase of overall project productivity
- Reduction of waste generation

Formal workshops are planned to execute process simplification VIPs. Their occurrence is at least once in the project preliminary phases, whereas for larger and more complex projects an earlier process simplification workshop can be appropriately added.

# Constructability VIP (1)

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This VIP is determined by the opportunity of implementing the newest Engineering, Procurement and Construction principles and associated lessons learned, in accordance with the facility operations and maintenance requirements and for the purpose of enhancing construction scope, cost, schedule, quality and safety.

In order to specifically recognize this practice as an actual VIP profitability improvements are sought above those which the project team will have identified in the course of its ordinary work.

# Constructability VIP (2)

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The constructability VIP extends from the beginning of the preliminary project phases through to the completion of the commissioning stage.

Its main objective is to optimise the joint utilization of operations, maintenance, engineering, procurement and construction expertise – both on-project and off-project – while adding the following characteristics to the more traditional approach:

# Constructability VIP (3)

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- Execution of one or more formal facilitated **constructability VIP workshops**
- Focus on the **pertinent aspects of every engineering stage of the project**
- Detailed functions **review of planning, design, procurement, fabrication and installation** to ensure that the lowest capital expenses and shortest reasonable schedule are achieved
- Consideration of **operability and maintainability** with reference to operations and maintenance requirements and available expertise.

# Constructability VIP (4)

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Early constructability VIP workshops should be focused on the overall project strategies.

Constructability VIP workshops in a subsequent project phase should be focused on more detailed arrangements of site layout and further analyses of schedule constraints and influence of fabrication processes and available expertise on the expected completion of later construction stages.

Finally, constructability VIP workshops located towards the conclusion of the project preliminary phase should be focused on additional provisions for effectively completing a preliminary approach to the detailed EPC stage, in which prior lessons learned will be reviewed and considered for convenient implementation.

# Predictive Maintenance VIP (1)

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This VIP is related to the following basic definitions:

- *Reliability* – Ability of an element to accomplish its stipulated function under fixed conditions, or ability to maintain its quality without perceivable variations under stated conditions of use.
- *Durability* – Ability of an element to maintain a stated performance level in a specified period of time.
- *Duration* – Defined period of time in which an element is able to maintain its characteristics (physical, performance and aesthetical).

# Predictive Maintenance VIP (2)

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Predictive maintenance is a class of preventive maintenance that is subsequent to the identification and the measurement of one or more parameters and to the extrapolation of the residual time to failure in accordance with appropriate models.

The predictive (or condition-based) strategy consists of periodic and pre-planned inspections and assessments to identify the moment in which a remedial action is absolutely required.

# Predictive Maintenance VIP (3)

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This action may fall in one of four categories:

- *Time-directed* – The prevention of a failure is envisaged
- *Condition-directed* – Identifying the occurrence of a failure
- *Failure-finding* – Recognizing hidden inefficiencies
- *Run-to-failure* – Deliberately deciding not to undertake maintenance until a failure occurs.

Predictive maintenance is **different from** – and **newer than** – preventive maintenance.

# Predictive Maintenance VIP (4)

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Predictive maintenance has the following benefits:

- reduces maintenance costs
- improves the confidence of extending time intervals between consecutive maintenance actions
- improves reliability
- provides a more predictable maintenance schedule.

This VIP, if not dictated otherwise by contractor's standards, should preferably be implemented in the project Feasibility Phase.

# Waste Minimization VIP

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This VIP incorporates environmental requirements into the facility design and combines life cycle environmental benefits and positive economic returns by:

- Removing or lessening the generation of waste through source reduction
- Recycling by use, reuse or recuperation those potential waste materials/components that cannot be removed or lessened
- Treating all waste that is still generated to reduce volume, toxicity or other harmful effects before storage or disposal.

This VIP, if not dictated otherwise, should be executed in a formal workshop and preferably implemented in the project Feasibility Phase.

# VIP Planning and Implementation (1)

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Each VIP has its own unique connotations and should be performed at a certain time and in accordance with a certain procedure to produce the best results for the project.

VIPs are powerful mechanisms to improve the overall (life cycle) economics of projects.

The return on investment for the cost of implementing each VIP is reported to be usually much greater than for the overall proposed project, even as great as at least an order of magnitude above.

# VIP Planning and Implementation (2)

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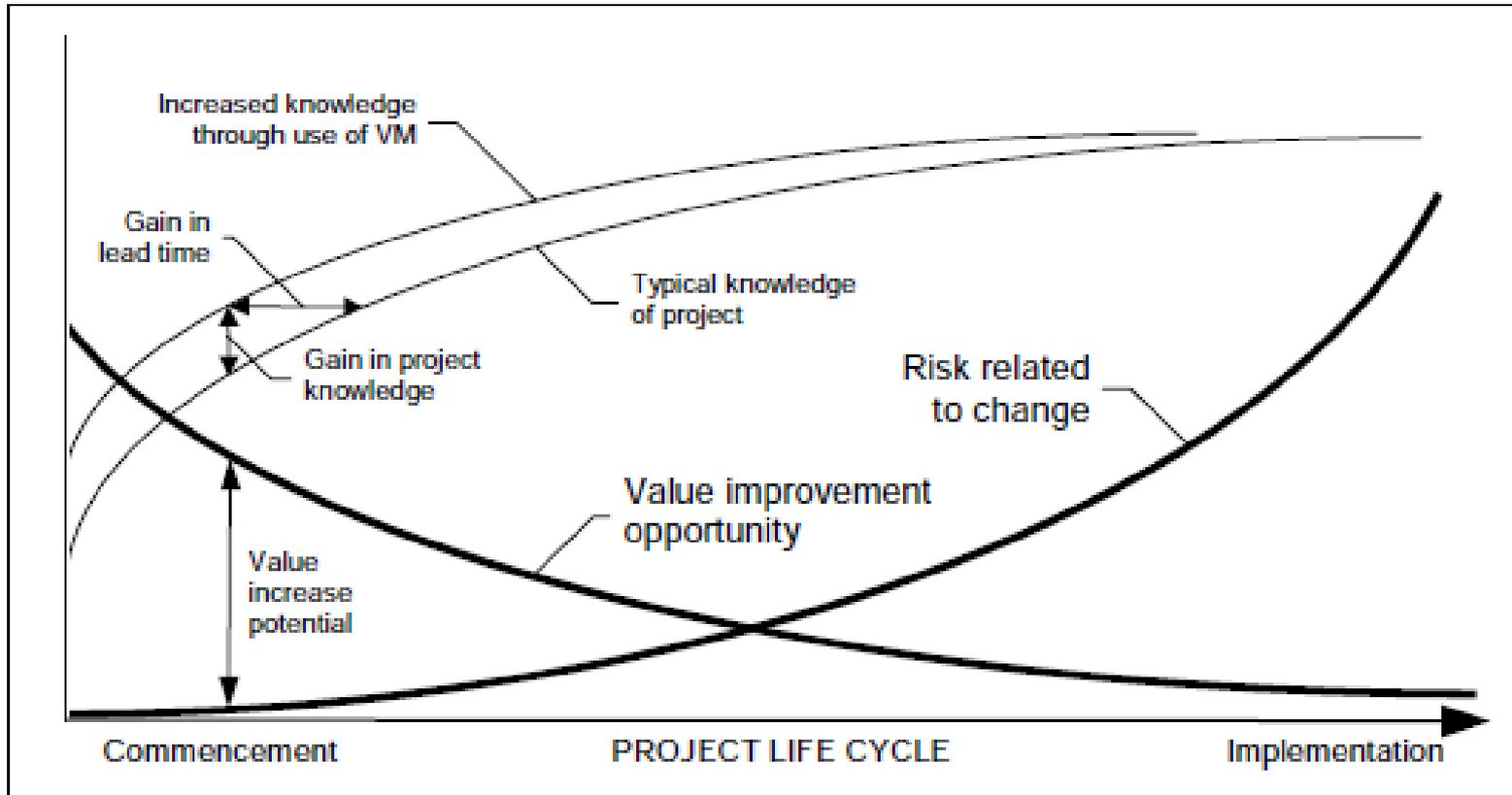
The benefits achievable from VIPs cannot be realized by just executing ‘good engineering’.

The application and implementation of VIPs to a certain project must be **intentionally and carefully planned** in the initial period of the project.

Before the beginning of a VIP, the goals, objectives and scheduled time for the formal workshop must be agreed upon by the (integrated) project team. **The formal workshop is always structured to make the largest use of the multi-disciplinary team’s time and effort.**

# CONCLUSIONS

## The benefits of Value Management (1)



*'Value management should commence during the early stages of a project'* (S. Simister)

# CONCLUSIONS

## **The benefits of Value Management (2)**

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- Value management aims to add value to projects in terms of time, cost and quality.
- It maximises the functional value of a project by managing its life cycle until the beginning of utilisation stage, balancing all decisions against a value system determined by the client.
- The value, or profitability, of capital projects can be enhanced by applying appropriate Value Improving Practices (VIPs), in comparison to the application of less profitable, more traditional engineering and project management practices.
- VIPs analyse project characteristics and features that are achieved at recognised optimum times during the life cycles of capital projects.