Management Elements of Organisational Re-engineering

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Synopsis of Dissertation

Dissertation name:	**Management elements of organisational re-engineering.**
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This dissertation is an examination of the Business Process Re-engineering (BPR) philosophy. The dissertation approach is to analyse the BPR philosophy through segmenting it into seven critical elements. These are elements that needs to be in place to ensure BPR success. Some of the critical elements are sub-components of BPR, while some others, such as the Balanced Scorecard and Project Management, are similar management philosophies that compliment the BPR approach. The seven elements examined are:

1. The identification of Economic Value Adding opportunities of Business Process Re-engineering.
2. Aligning Business Process Re-engineering initiatives with organisational strategy by means of the Balanced Scorecard.
3. Business Process Re-engineering methodologies, techniques and tools.
4. The utilisation of Best Practices and Benchmarks during the Business Process Re-engineering effort.
5. Project Management techniques applicable to Business Process Re-engineering projects.
6. Implementation Drivers that helps ensure the success of Business Process Re-engineering.
7. Capturing of Business Process Re-engineering designs in Business Architectures.

By no means are these the only elements involved in BPR, but it does form an essential structure for it. None of these elements are ground breaking new research subjects, although most of them are very topical in the business world at the turn of the millennium, and some are still going through growth pains in terms of practical validation. The scope of explanation for these BPR elements is kept at a practical and understandable level, with some deep drills into detail. The main objective of this dissertation is to offer a group of elements that can be used as a whole, or as selective tools during any type of Business Process Re-engineering effort.

All these elements will be referenced against experiences from the industry in the form of an actual Business Process Re-engineering project that incorporated all these elements and results from their use. The dissertation deliverable is a usable composition of elements, or a BPR toolbox that can be used by Business Process Re-engineering practitioners as an aid in their efforts.

Opsomming

Verhandeling titel: **Management elements of organisational re-engineering.**

Student: **Casper-Cobus Koorts**

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Hierdie verhandeling is 'n ondersoek van die Besigheids Proses Ingenieurswese (BPI) filosofie. Die benadering gevolg was om die filosofie te segmenteer in die mees kritiese elemente wat suksesvolle BPI verseker. Sommige van die elemente wat bespreek word, is onder afdelings van BPI, maar ander, soos byvoorbeeld die gebalanseerde telkaart en projek bestuur, is eweknie filosofieë wat BPI komplimenteer. Die elemente wat onder bespreking is, is:

1. Hoe ekonomiese waarde toevoegings (Economic Value Adding) geleenthede vir BPI geidentifiseer kan word.

2. Die vereenselwiging van die organisasie se doelwitte met BPI doelwitte deur middel van die gebalanseerde telkaart (Balanced Scorecard).

3. Die BPI metodologie, tegnieke en gereedskap stukke.

4. Hoe beste praktyke (Best Practices) en metingsoefeninge (Benchmarks) gebruik kan word gedurende BPI.

5. Projekbestuurbeginsels van toepassing op BPI projekte.

6. Implementeringsdrywers vir die versekering van BPI sukses.

7. Die gebruik van besigheids argitekture om BPI ontwerpe te akkomodeer.

Onder geen omstandighede word die aanname gemaak dat hierdie die enigste elemente van toepassing is op BPI nie, maar dit spreek wel die mees belangrikste dele van die filosofie aan. Hierdie onderwerpe is nie nuwe velde van studie nie, maar is almal baie toepasbare konsepte wat van groot relevansie is in die huidige besigheidswêreld. In hierdie verhandeling word daar meer op 'n breë, toepasbare vlak na die BPI elemente gekyk, inplaas van om in geweldige detail na die elemente te kyk. Die hoof doelwit van die verhandeling is om al die elemente as 'n groep bruikbare gereedskapstukke voor te lê, wat as 'n eenheid, of op individuele basis gebruik kan word.

Elkeen van die elemente word verduidelik teen die agtergrond van 'n praktiese BPI projek voorbeeld wat self elk van die elemente bevat het. Die aflewerbare van hierdie projek is om die groep BPI elemente so uit een te sit sodat BPI implementeerders dit kan gebruik as 'n BPI gereedskapskis.

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Table of Contents

List of Figures

List of Tables

Glossary of Terms

"As Is"	A representation or description of a current state (e.g. an organisation, a process, etc.).
Balanced Scorecard	A conceptual framework for translating an organisation's strategic objectives into a set of performance indicators distributed among four perspectives: Financial, Customer, Internal Business Processes, and Learning and Growth
Benchmarking	A point of reference, a criterion. A quantitative comparison between two or more entities.
B's & C's	Benefits & Concerns - a method to ensure constructive feedback. Action-oriented statements. Benefits are always given before concerns.
Benefits	The "pluses" of an idea.
Benefits Case	A validated hypothesis that defines an opportunity idea, the target for improvement and Key Performance Indicators (KPI's) that measures quantifiable financial benefit to the organisation. Benefits cases provide means to increase direct bottom line earnings.
Best Practices	Best practices are those procedures that are superior in terms of performance and cost when compared within the company or within the industry.
Blueprinting	The process of identifying the best possible design for the future state of an enterprise. The blueprinting process develops an architecture of the enterprise. Identifies possible improvement alternatives, and develops recommended implementation plans to improve the enterprise's strategy, organisation, skills of its people, culture, and systems in an integrated, efficient manner.
Brown Paper	A visual snapshot of an entire operating process highlighting all applicable interfaces, documentation, and data sources. (It is called a brown paper because it is constructed on brown paper!) The Brown Paper is a process flow illustration whose primary focus is on content. ***(Alt.)*** A visual display of a panel set or other material, pasted onto brown paper for presentation purposes.
Business Architectures/ Enterprise Architectures	A conceptual structure and logical organisation of a business entity / enterprise which depicts its life cycle and variant perspectives of its operation (from a high level down to detail operation).
Business Process Re-engineering	An approach to corporate change which emerged in the 1990s, it involves analysing an organisation's core processes and reassembling them in a more efficient way, without functional divides.
Business Intelligence Systems	Systems that provide the ability to report critical corporate data efficiently and in real time by means of online analytical processing interactive reports.
Buy-in	Consensus and acceptance of an idea by any party directly or indirectly impacted by it

Case Study	A focused historical description and analysis of a company illustrating how it achieved its strengths and/or weaknesses.
Change Management	A process of defining and implementing improvements utilising best practices and benchmarking knowledge. The focus is on the orchestration and control of the effects of change on strategy, systems, people, organisation, culture, and on gains anticipated rather than holding on to what might be lost.
Charter	A formal authority containing specific objectives and guidelines to expend manpower and expense to resolve one or more related issues. In Project it is seen as a formal document of the Project Manager's authority, responsibility, and set the scope for the project.
Coach / Champion	A senior executive who supports a key project initiative or workstream by providing guidance, eliminating barriers and reviewing recommendations.
Concerns	Expressing negatives in a more positive, leading to action format.
Configuration	The technical composition of the subject of a project contract.
Configuration Management	The orderly process of the formal review and approval of configuration changes to projects.
Continuous Improvement	An organised process for accomplishing on-going change in a complex business environment. This process views strategy, organisation, people, culture, and systems as a whole and not as individual elements.
Critical Success Factors	Those things that must go right in order to achieve certain goals.
Data Warehouse	A place – physical or virtual – in which business information is gathered.
Dashboard	Visual display of a selected group of measures, typically against targets previously set (Used in relation to the Balanced Scorecard)
Deliverables	Recommendation or the outcomes of those recommendations. Must be agreed to and measurable.
Economic Value Adding	The amount by which the Bottom Line exceeds the equity shareholders return expectation. Formula for Economic Value Adding: EVA = Net Operating Profit After Taxes – [Capital x Cost of Capital]
Electronic Commerce (e-commerce)	The commercial exchange of goods, services, information, or ideas between two or more parties enabled by a digital medium
Electronic Data Interchange	Transmission of documents via any electronic medium using a set of standard forms, messages and data elements.
Enterprise Resource Planning Systems	An integrated system of operation applications combining logistics, production, distribution, contact and order management, sales forecasting, and financial and HR management.
Executive Steering Group (Steering Committee)	A team of senior executives who oversee a project. They provide direction, support, barrier removal, decisions and direction to the team.

Facilitate	Concentrate on working through the process (keeping to the agenda of a meeting), and not get caught up in the issues. A facilitator initiate, orientates, assists, and integrates a group of people. His role is to help clarify, develop and summarise other people's ideas.
Gantt charts	Visual bar charts which show the amount of time and the sequence of activities that have to be performed.
Information Technology	The Hardware and Software that is used to process information.
Key Performance Indicators	Specific measures of performance.
Knowledge Management	This term refers to deliberate efforts to maximise an organisation's performance through creating, sharing and leveraging knowledge and experience from internal and external resources.
Milestone	A milestone is a defined event / result to occur at a predetermined point in time. It is a fixed deadline, often at the beginning / end of a phase and is used to monitor a critical part of the project.
Natural Work Team	A small group of multi-level, multi-functional people dedicated to achieving a specific objective or several related objectives. The team has clearly defined milestones and deliverables and disbands when the objectives are met.
Network Diagram	The network diagram is a tool for analysing, describing, planning, monitoring, and controlling project sequences. It consists of a graphical representation of the logical links between activities, and illustrates timing of all activities and their dependencies.
Next Steps	Follow-up activities or commitments including personal accountable or responsible and completion time.
Optimise	To make the best or most of; to develop to the utmost.
Paradigm	A set of rules which guarantees success when followed; Constraints within which a process or method are being followed; "Its the way we've always been doing it."
Paradigm shift	Term used to describe a complete re-thinking of the business or economic outlook, caused by a startling intellectual or technology discontinuity.
Process	A continuous and regular action or succession of actions, taking place or carried on in a definite manner, and leading to the accomplishment of some result; a continuous operation or series of operations. The way in which a function gets accomplished within a specific setting.
Project	Is a once-off sequence of activities, which is characterised by a limited time schedule, a clear target, transparent predefined costs and a specific organisation.
Process Flow Analysis	A procedure used to portray the sequence of activities, inputs, events, interfaces, and documentation involved in a selected process. The analysis has a predetermined start and end point and related guidelines for construction depending on its intent and purpose. Examples of Process Flow Analysis techniques include: PERT Charts, Brown Papers, Flow

	Charts, and Block Diagrams. Process Flow Analyses are used to clarify details, highlight strengths and opportunities, and promote understanding.
RACI	Responsibility, Accountability, Consult & Inform. A tool to chart within a matrix those people/positions responsible, accountable, consulted and informed in specified identified functions or tasks.
Rapid Action Team	A highly focused team which addresses a particular issue. Typically short in duration and high in impact.
Statement of Work	A narrative description of the work required for a project.
Strategy	An integrated plan which defines both the objectives and the means through which they can be achieved. Strategy includes assessment of internal and competitor strengths, weaknesses, opportunities, and threats, market structure and attractiveness, and competitive rivalry.
Strawmodel	An initial version used as the basis or foundation for a final version. The purpose is to facilitate discussion leading to the development of the final version.
"To Be"	A representation or description of the proposed state of an entity (e.g. an organisation) normally built using the "As Is" as a point of departure.
Toolbox/kit	A collection of information, procedures, and data intended to serve as a supplement to training, and to make implementation easier.
Validate	To share information or opportunities with any directly or indirectly impacted party to ensure accuracy of that information and achieve buy-in.
Value Chain	A concept associated with the focus on a company's internal processes and interaction between different elements of the organisation. Analysis of it shows how and where value is added.
Work Breakdown Structure	A subdivision of the project objective into a tree of smaller objectives, which clearly defines the objective in its totality and contributes to its understanding.
Workflow	It is the flow of information and control in a business process

Abbreviations

A & D	Analysis and Design
BA/EA	Business Architectures / Enterprise Architectures
BI	Business Intelligence
BP	Brown Paper
BPR	Business Process Re-engineering
B's & C's	Benefits and Concerns
CE	Concurrent Engineering
CIM	Computer Integrated Manufacturing
CPM	Critical Path Method
CSF	Critical Success Factors
DFA	Design For Assembly
DFM	Design For Manufacturing
DILO	Day In the Life Of
EBT	Earnings Before Tax
EDI	Electronic Data Interchange
ESG	Executive Steering Group
ERP	Enterprise Resource Planning
EVA	Economic Value Adding
H2	How To
IBP	International Best Practices
ISO	International Organisation for Standards
IT	Information Technology
IWIK	I Wish I Knew
GERAM	Generic Enterprise Reference Architecture and Methodology
Grai GIM	Grai Integrated Methodology
JIT	Just-In-Time
KPI	Key Performance Indicator

KM	Knowledge Management
NWT	Natural Working Team
MBNQA	Malcolm Baldrige National Quality Award
MRP	Materials Requirement Planning
MRP II	Manufacturing Resource Planning
OLAP	Online Analytical Processing
PDCA	Plan Do Check Act
PDR	Plan Do Review
PERA	Purdue Enterprise Reference Architecture
PERT	Program Evaluation and Review Technique
QFD	Quality Function Deployment
RACI	Responsibility, Accountability, Consulted, Informed
RAT	Rapid Action Team
RD	Results Delivery
SDLC	System Development Life Cycle
SLA	Service Level Agreement
SOW	Statement of Work
SPC	Statistical Process Control
SQL	Structured Query Language
TQM	Total Quality Management
VA	Value Analysis
VE	Value Engineering
WBS	Work Breakdown Structure

1 Introduction Chapter

1.1 Background to the dissertation

Research and preparation work for this dissertation started with a "prequal" project entitled "Methods to manage Business Process Re-engineering projects" (Project BPJ 780 – 1998). It was based on techniques and tools utilised during BPR and the project management principles applicable to re-engineering projects. These subjects now form part of the chapters discussing BPR methodologies and Project Management of BPR projects. This project also involved studies from the Sietel re-engineering project, but focussed more narrowly on experiences during the design phases of the project.

The scope of this dissertation is wider than the prequal project, in that it examines more elements involved in BPR and was only finalised after the closing of the Sietel re-engineering project. Thus it reviewed the Case Study project in its totality and could make conclusions about post BPR results.

Sietel is a major supplier of telecommunication equipment with an annual turnover in the excess of R3 billion (1999). The need for BPR was evident to the Sietel management based on a change in the telecommunication market, which required Sietel to change its way of doing business. In addition Sietel had to address its ability to maintain and increase its profit margin, while aligning itself with new market opportunities (3rd cellular license & 2nd fixed line license). It undergone an extensive BPR effort over the last 2 years, of which full time resources were dedicated for 19 months of that period. The author himself was one of the dedicated resources along with other internal Sietel employees and external consultants.

In addition to literature studies, the Sietel case study, and working closely with experts in the field of BPR, information for this dissertation were also drawn from other post graduate courses presented at the Pretoria University. Some of these courses being: Financial Management BFS 820, Business Logistics BLK 780, Quality Assurance Management BTY 780, Advanced Information Systems Design GIO 780 and Business Architectures BBA 780 presented at the Business School, Information Technology department and Industrial Engineering.

1.2 Dissertation objective

David Upton, from the Harvard Business School, introduced in his course notes: "Designing an operations improvement path" a framework for designing an improvement path that is applicable across a range of operations situations. This framework ask the following 7 critical questions [34. Upton]:

1. Context and motivation: Why is the improvement initiative taking place and what is driving it?
2. Direction and goals: Where is performance to be improved and how will it be measured?
3. Focus: Where will we concentrate internally to achieve the desired goals?
4. Methods and techniques: What will our "toolkit" be for this improvement effort?
5. Resources: What financial and human resources will be required?
6. Organisation and phasing: How will the initiative be organised, and in what order?
7. Learning capture and leverage: How will what is learned in the initiative be captured?

In the epilogue of his book "Reengineering the corporation", Hammer felt gaps still needed to be addressed in terms of a re-engineering methodology, how to orchestrate the change campaign, the design and timing of releases of re-engineered processes, and tactics for dealing with the most common BPR problems. [4. Hammer et al]

The objective of this dissertation is the exposition of seven critical elements that is of importance during organisational Business Process Re-engineering (BPR). As approached in this dissertation these elements are also applicable to other change management philosophies. References will also be made to other philosophies and their interaction with BPR. These seven elements are:

1. The assessment of Economic Value Adding (EVA) opportunities for BPR
2. Aligning BPR initiatives with the defining of organisational strategy
3. BPR approaches, methodologies and tools
4. Utilisation of best practices and benchmarking during BPR
5. The Project Management of BPR projects
6. Implementation drivers to ensure the success of BPR
7. Utilisation of Business Architectures to capture results from BPR

By no means are these the only elements required for BPR, but they do address the core of the philosophy. Information Technology utilisation during BPR, as an example are only referred to, but not discussed as an element.

Even though it is not the main purpose of this dissertation to address Upton or Hammer's questions and open issues, there are relevant similarities between the seven elements discussed in this dissertation and questions from these gurus. The main purpose of this research dissertation is to explore the BPR philosophy in its totality, but also segment it into its critical parts. Each of these parts also stands in their own rights as management philosophies and can be viewed individually in their contribution to BPR efforts. Thus individual chapters can be used as separate BPR tools, but still form part of the dissertation as a BPR toolbox.

The research done for this dissertation was based on literature studies of re-engineering related books, articles from academic and commercial magazines and conferences, case studies presented at conferences and in academic literature, and from internet published articles and whitepapers. The knowledge gained from literature searches were compared and tested against experiences from a 2-year re-engineering project, which the author were involved in. Vice a versa, methods used in the project are also referenced against these literature studies and this (Sietel) re-engineering project are also used as case study through out the dissertation. Because of vast BPR expertise contained within management consulting companies, much of the research were also drawn from white papers and articles produced by various such companies. In addition training material presented by one such company (Gemini), which the author worked closely with on the Sietel re-engineering project, were also used.

Most of the articles, white papers and HTML web pages that was in electronic format at the time of research, accompany this dissertation in the form of a CD ROM. The purpose of this CD is to act as a BPR toolbox containing BPR related literature studies and relevant training presentations, which aspirant BPR practitioners can use as aid.

1.3 Motivation for dissertation approach

Although each of the chapters can stand in their own right, there is a specific logic in the sequence in which they were inserted in this dissertation. It has to tell a business story. The initial two chapters start with a business orientated approach at a high level for the purpose of convincing executive management. Once the decision for BPR is made at the high level, more detail regarding BPR has to be considered by the practitioners and executors of the initiative. Thus the middle three chapters provide guidance on direct BPR related activities. The two chapters that follow focus on elements critical to finalising BPR initiatives positively and leaving sufficient evidence of its results. The final chapter is an example in the form of a case study on the contents of this dissertation.

1.3.1 High level, business orientated approach

As with any project, change management, or BPR projects must have a financial sound reason for undertaking. Thus the first element coming to attention is that of quantifying a financial business case for BPR through EVA opportunities. To ensure that a BPR initiative is not misguided, and addresses the organisation's core business issues, strategy alignment is necessary. The first two elements on assessing EVA opportunities and linking organisational strategy to BPR initiatives address this business orientated approach required for BPR.

1.3.2 Practitioner's guidance

Once the scene is set in terms of the reasoning and strategy alignment for a BPR exercise, attention must be given to the required BPR activities. The chapter on BPR methodology provides theoretical and practical guidance to the process, tools and interventions for re-engineering. Closely related to the methodology are best practices and benchmarks necessary to support the re-engineering exercise. Practitioners need to have best practices knowledge in order to re-engineer processes. As part of BPR execution, the orchestration of the whole exercise is critical. The Project Management of BPR projects chapter focus on specific project management activities that is most applicable to BPR projects.

1.3.3 Finalisation elements

A unique characteristic of projects is that they have definite end dates. Similarly BPR exercises must come to a definite end. In order to accomplish BPR finalisation, evidence of the exercise must be prominent in the organisation in terms of the change that was accepted and implemented, and blue prints of what was done. The Implementation Drivers chapter focuses on critical success actions that can be followed to ensure organisational acceptance of the BPR results and delivering a positive outcome. The Business Architectures chapter reviews various structures that can be used to capture the final blue prints of the organisation, and also provide support in the form of reference architectures.

1.3.4 Concluding case study

This dissertation concludes with the business architecture of a re-engineered function from the Sietel case study. The business architecture format was customised according to the re-engineering requirements of the specific function and encapsulates most of the philosophies examined during this dissertation.

2 Assessing opportunities for BPR

2.1 Economic Value Adding (EVA) Opportunities Introduction

Why re-engineer a business, or undertake massive change management projects? There are a number reasons why organisations should be hesitant about BPR:

- BPR is a painful experience for the whole organisation, management are confronted with uncomfortable facts and decisions, and employees are inundated with uncertainty and changes.
- BPR is a dangerous exercise, it tampers with the organisation's fabricate, and it is very possible to effect an organisation's business negatively.
- It is a very expensive exercise in the form of consultancy costs, resource costs, and more often than not, IT implementation costs.

Management need to state a reason for BPR in terms of what is the organisation's current situation and why it cannot remain in the situation (the 'burning platform'), then state where the organisation needs to be (the 'beneficial situation'). When looking at the generic benefits of BPR (once it has been successfully implemented, which in itself only have a success rate of 25-50%[12. Bulletpoint]), experts has written books full about all the intangible benefits of BPR:

- Creating a lean, mean, dynamic organisation with a culture more susceptible to change (which is especially required in global market's adapt or die environment).
- Massive knowledge transfer throughout the whole organisation, leading to a transparency and better understanding of the organisation's business for all employees.
- Better alignment of business processes, which leads to more accurate measuring of operations and faster detection of something going wrong.
- Improved productivity in operations and freeing-up of capacity due to optimised processes.

Such deliverables are all very well, but it does not easily relate to financial benefits for shareholders and executive management to see. Indirectly these benefits can lead to increased business opportunities, or identifying staff that can be made redundant, and a reduction of costs. But the days of 'slash and burn', and downsize re-engineering has come to an end due to a global trend from governments to oppose rationalisation of organisations. Emphasis is rather placed on the creation of wealth, thus the deliverables from change management projects are to produce tangible, quantifiable Economic Value Adding (EVA) opportunities that can be measured in financial means.

2.2 Chapter Objective

Before BPR is taken on, a business case must be presented to executive management. Just like with any other business investments, a BPR project should deliver a return on its investment. This chapter will look at the various types of EVA opportunities for BPR, and how these opportunities are identified, converted into benefits cases and realised. A set of benefits cases can be compiled into a business case and returns projected over a future period.

2.3 Defining EVA opportunities for BPR

Vello Reili define EVA as: 'The EVA concept comes from accountants realising that the traditional "Bottom Line", i.e. after tax earnings, numbers do not completely reflect the equity shareholder view-point. The missing part is the fact that equity shareholders have invested money and they expect a return on that investment. If the "Bottom Line" is less than their expected return, they are dissatisfied. If it is greater, they are happy. The amount by which the "Bottom Line" exceeds the equity shareholders return expectation is called EVA.' [47. Reili] To put it in simple words: EVA measure if a company's profit exceeds its cost of capital, thus a positive EVA would be if return on capital exceeds cost of capital.

To identify financial opportunities that will add economic value to an organisation, the focus of BPR initiatives are to influence an organisation's Earnings Before Tax (EBT). EBT include all earnings on ordinary activities before taxation [3. CIMA]. 'Creative accounting' can also influence after tax earnings (in order to effect EVA), but it is the effect of operational issues that this dissertation focus on. Typically the following three types of operational initiatives will effect EBT:

1. Increase sales or revenue enhancement
2. Cost reduction or avoidance
3. Asset management or interest cost savings

Each one of these types of initiatives can contribute in various means to EVA opportunities [46. Siemens top+]. Figure 2-1 illustrates how the combination of these cost cutting and sales increase initiatives produce a "V-concept" on improving EVA.

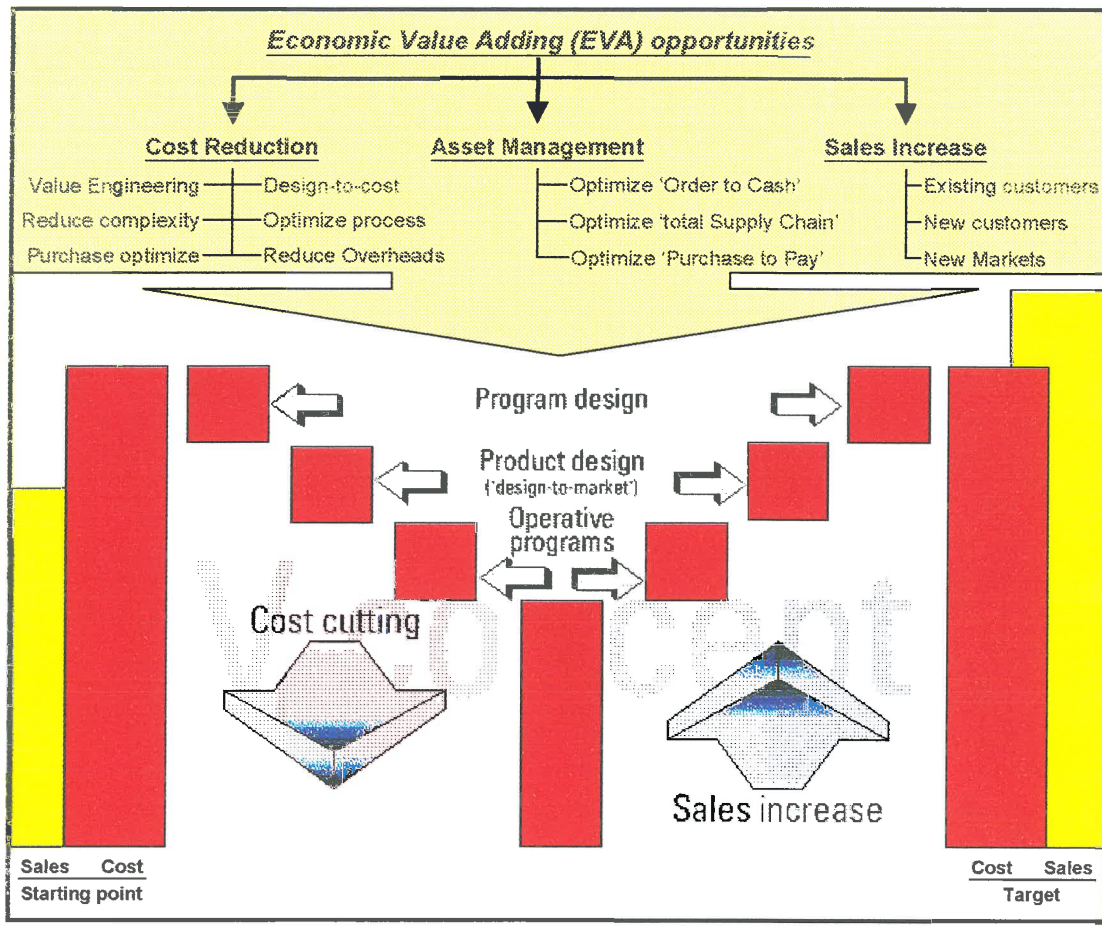


Figure 2-1 The V-concept of improving EVA [46. Siemens top+]

2.3.1 Sales Increase

Sales Increase or Revenue Enhancement can come from:

- Obtaining increased sales from existing customers
- Obtaining new customers in an already served market
- Penetrating new markets for an existing product/service range or for a new product/service range.

By re-engineering the Sales Force Effectiveness of an organisation, such revenue enhancement objectives can be pursued. To attempt such means of increasing sales, requires either strong growth in the market, or a rethinking of the business approach. Depending on the particular business situation, sales levels can be increased in a number of ways:

- **Increasing sales in existing markets** can be done by tapping reserve potential among existing customers. By becoming a preferred supplier to customers, or by marketing more aggressively, or by providing customers with new business offers even before they request it, more business can be gained. The aim of is to provide increasing value to your existing customers.

- **Moving into new regions** by means of portfolio optimisation, or co-operative ventures and acquisitions. Portfolio optimisation is a strategic planning process at both businesses level and at product level. From the point of view of an entire business, portfolio optimisation involves distributing resources correctly among the various business fields. Opportunities as to which can be expanded, which maintained at current levels and which scaled down can be identified. If there is a lack of organisational resources in a lucrative area, co-operative ventures can be pursued.

- By **developing new business fields**. This initiative depends on the sales strategy. It can be broadened to offering products/services that is closely related to the organisation's existing offerings, or the current portfolio can be offered to a wider market (moving into under developed countries, for example).

- By **introducing new products**. If the organisation have development capabilities, it can utilise it by taking advantage of introducing new products into markets. Especially when the development process is optimised for a quick time to market, benefits can be reaped from being the first and only supplier of new products.

2.3.2 Cost Reduction

Cost Reduction or Avoidance can depend on the nature of the costs incurred and the structures involved, a variety of levers can be worked. The levers include:

- **Pruning the product program**. By means of ***Value Engineering*** all features, functions and components of products or services can be identified and quantified. Cost analysis on these elements can help to identify opportunities to increase value, while reducing costs.

- **Design-to-cost** (where cost-cutting is built into the development process). Concurrent Engineering techniques such as Design For Manufacturing (DFM), and Design For Assembly (DFA) identifies opportunities to minimise the number of parts, and optimise the manufacturing and assembly efforts for products [39. Brecker Associates]. These improvements are incorporated into the design of the product, which reduces its overall costs.

- **Reducing complexity** – Simplifying operations by eliminating unnecessary activities create opportunities for reducing operational costs. Sometimes old manual control methods on operations added non-value-adding activities. With implementation of modern systems (such as a bar-coding system in picking and dispatch operations, for example) such operations can be simplified, reducing man-hours and lead-time.

- **Optimising processes** – Alignment and streamlining of Supply Chain processes can cause "fall-through-the cracks" discrepancies and redundant operations that cause additional costs to be eliminated. Unclear Roles and Responsibilities, for example, can cause no ownership of some

activities and double work of other activities. These occurrences usually accumulate as unplanned costs on projects, or additional overhead costs.

- **Purchase optimisation** – A large portion of any organisation's turnover is spend on purchases of materials from suppliers. Even a small reduction on average purchase costs can lead to profit margin increase. Other supplier driven costs range from ordering, scheduling delivery, and paying for the materials, through to the scrap, rework and obsolescence caused by the materials and schedule disruptions from incorrect deliveries. These areas offer considerable opportunities for cost reductions.

- **Lowering overhead costs**. The objective of BPR is to eliminate all non-value-adding activities. Such activities usually accrue costs as overheads. The challenge is to identify these activities and either incorporate relevant costs to projects, products or services, or reduce and eliminate these costs in order to achieve an optimum margin of overhead costs.

2.3.3 Asset Management

One of the most important business opportunities is asset management. The optimised deployment of company assets improves EVA through interest cost savings. Fixed assets and working capital need to be kept as low as possible. Of these, special attention is devoted to working capital. Working Capital is made up of receivables and inventories less payables and down payments received. Working capital and fixed assets together constitute a company's business assets. Deploying and managing these assets in the best possible way is the task of asset management.
Attempts in the form of BPR initiatives to reduce working capital involve optimising the following key processes:

- The process from formulation of an order, through order processing, to receipt of payment (the **"order to cash" process**). From the moment a customer request a quotation or places an order, costs start to incur. It is important to get payment from the customer as soon as possible. Lead-time reduction and progress payments are the most common levers used.

- The process by which materials flow through the company, from storage and production through to shipment (the **"total supply chain" process**). Any type of material in any state resembles capital tied up. To save interest on working capital, key drivers are increasing inventory turnover, shortening of production lead times, and reducing transportation time.

- The process from selection of suppliers through purchase orders to receipt of goods and payment of the suppliers (the **"purchase to pay" process**). In this process advantage can be taken of the credit supplied by suppliers. The objective though should not necessarily be to try and pay suppliers as late as possible, but to optimise the materials sourcing process. Ideally goods received from suppliers should be processed, packed and delivered to customer**s,** and the customers invoiced even before paying the suppliers.

2.4 Identifying, Realising, and Measuring Opportunities

All the EVA initiatives mentioned in the previous paragraph is very good for identifying opportunities and motivations for BPR. The problem though, is still *how* to quantify these opportunities in financial terms *before* BPR is undertaken. For this purpose a Benefit Case Tracking methodology must be used to identify, quantify, scoreboard, track and realise opportunities.

2.4.1 Benefits Cases

Defining Benefits Case opportunities for BPR are done during a pre-project analysis phase (refer to the Analysis and Design phase in chapter 2). The Benefits Case methodology followed are [33. Tirisano]:

1. **Opportunity/Idea Identification** - Supply Chain assessment with the help of Best Practices and Benchmarks (refer to chapter 3) and sometimes the use of outside consultants for unbiased perspectives. In this assessment opportunities for improvement are identified. For each opportunity a hypothesis is formulated (idea identification) with a proposal for optimisation and a related benefit type (sales increase, cost reduction or asset management).

2. **Defining targets** - Each of these hypotheses must be tested and validated with relevant process owners in the organisation, and quantifiable and non-quantifiable targets must be derived. For this validation process employees can be interviewed, or involved in workshops that deal with the specific optimisation issues in their areas of expertise. From their experience process owners should be able to project quantifiable targets with a low case and a high case.

3. **Scoreboarding Benefits Cases** - For each validated hypothesis a Benefits Case, which defines the idea, the target and Key Performance Indicators (KPI's) that must be measured are scoreboarded. KPI's are the core of Benefits Cases. It is a quantifiable indication of process improvement that can directly be related to financial opportunities. Included in the Benefits Case is the calculation of how KPI's relate to financial gains or losses. Usually KPI's are referenced against a baseline year (KPI example: Debtors days for 1997 is 55 days = R21'6m in asset management costs; Improvement of 10 days = R3'9m EVA opportunity). Calculation of benefits is always in relation to the baseline, to ensure business growth is filtered out and only optimisation is measured. Each Benefits Case must be signed of by a Coach, who validate the logic of calculations, and the Executive Steering Group for the BPR project. Figure 2-2 is an example of an Asset Management Benefits Case that is structured for scoreboarding.

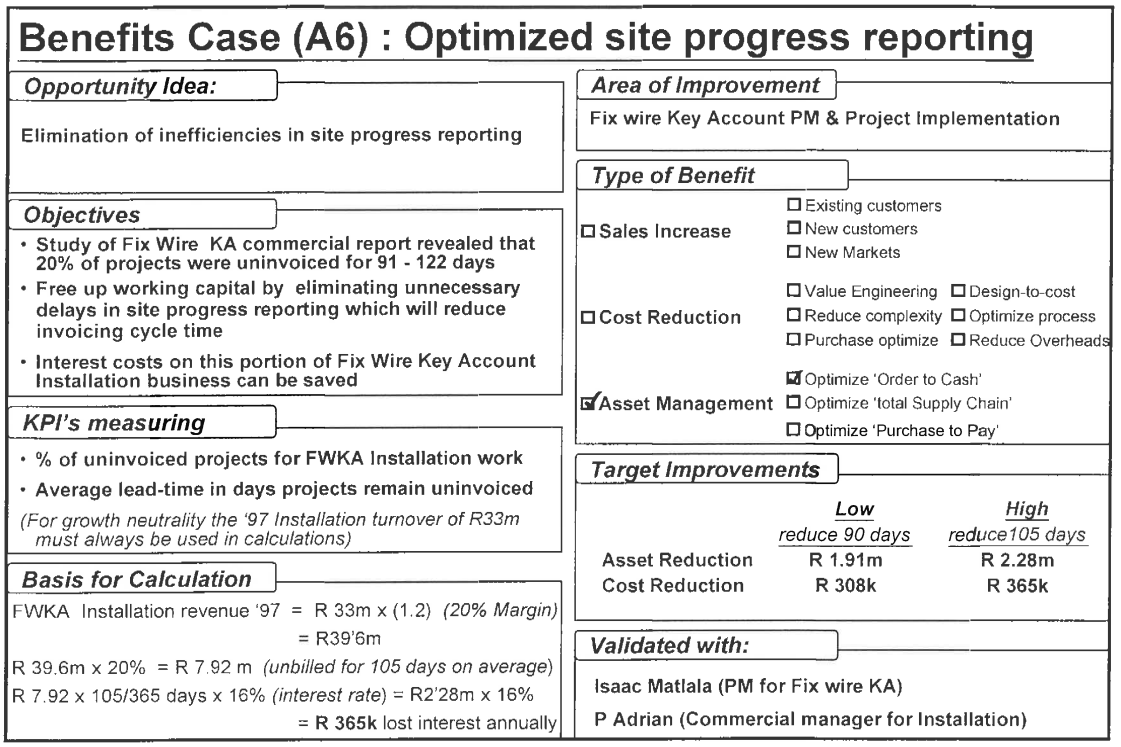


Figure 2-2 Example of a Benefits Case

4. **Opportunity Realisation** - In the Design phase of the BPR project, aspirations for future Supply Chain processes will be defined (see chapter 3). These aspirational processes must directly focus on achieving the optimisation targets identified in the Benefits Cases. As the processes are re-engineered to achieve the aspirations designed, process improvements will be indicated by the KPI's.

5. **Results Monitoring** –After a Benefits Case is scoreboarded, the logic of benefits calculation is fixed. The only variable fed into the equation from then on is the KPI's. Each month the KPI's must thus be tracked and the relating financial benefits (or in some cases losses) calculated. These benefits must be reported to the Executive Steering Group to monitor the progress of process optimisations.

This method sets a benefit tracking process in place that indicates to executive management what direct financial results BPR delivers.

2.4.2 Benefits Case examples

The following tables are examples of actual Benefits Cases from a BPR project within Sietel. [33. Tirisano] It describes how the ideas were defined, what were targets set, the procedure for realising and monitoring the benefits, and what were the actual results. All four these examples came from the Installation and Commissioning area of the organisation. The first 2 examples (in Table 2-1) were Benefit Cases with specific Cost Reduction objectives:

***Installation Catalogue Time Reduction*:**	
Idea Identification: Reduce catalogue (standard) times to perform installation activities, due to: better training, more experience, increased productivity, better designed equipment (design for manufacturing & installation) and optimised test procedures. Installation work is done in less time, but still sold at the same price. This increases the profit margin and give Sales managers better negotiation ability.	**Targets definition:** Project Implementation set the target to reduce installation times and cost estimates by **10% per year**. Sales thus increase the installation profit margin by 10% per year.
Procedure: Installation managers reviewed the average times it took to perform installation activities and complete projects by measuring man-hour KPI's. Every 6 months these KPI's were then reviewed by the Installation managers and compared to the catalogue installation times on which quotes are based. Relevant catalogue times are then reduced.	**Results:** The Project Implementation department has reduced their installation quotes by **12% or R785k in total**, which directly benefited the profit margin of the organisation. .
***Reduction of Unplanned Overtime*:**	
Idea Identification: Better project management, process optimisation, clearer Roles and Responsibilities and interaction with logistics, facilitate better planning for installation projects. This cause reduction of waiting time on site and the elimination of unplanned overtime, which is seen as overhead costs.	**Targets definition:** In the 96/97 year, Installation activities used 19% more time than planned (**negative gap of 19%**). This gap equals to an annual overhead cost of **R5'5m**, which can be reduced by better planning and improved project management.
Procedure: When estimating hours required to perform installation activities, Installation Project Managers take into consideration that certain of the work must be done after hours, (due to customer requirements) and thus plan accordingly. Deliveries of equipment to site and Installation teams are co-ordinated through improved communication with the LPM. Installation managers monitor installation projects for time used compared to the initial planned hours. Pro-active steps are taken to clear out problems if it seems as though a project might overrun on man-hours booked.	**Results:** • For 97/98: unplanned installation **man-hours was reduced to 1%,** equals a **cost saving of R5'6m**. • For 98/99, **15% less installation man-hours than planned**, resulting in a **cost saving of R5'9m**. • The total cost saving on installation overtimes over 2 years to **R11'5m**

Table 2-1: Cost Reduction Benefits Cases Realised

This following Benefits Case (Table 2-2) was based on an opportunity to improve asset management:

***More consistent site progress reporting*:**	
Idea Identification: A study of Installation projects commercial reports revealed that 23% of projects were uninvoiced for 91 – 122 days. Working capital can be released by eliminating unnecessary delays in site progress reporting and reducing lead-time to invoicing.	**Targets definition:** In the 96/97 year, Installation activities accounted for R39'6m in turn over. 105 days lead time for invoicing ±20% of this (at 16% interest) = R365k in lost interest
Procedure: By establishing close co-operation between technical and commercial staff, roles & responsibilities in process activities were cleared out and more consistent site reporting were done. All installation supervisors aimed to have progress report ready by the 20th of each month, to allow commercials to bill by the 25th. The KPI's measured were the % unbilled contracts and the number of unbilled days.	**Results:** • For 97/98: unbilled contracts reduced to 15% with unbilled lead time 90 days = R131k saving in interest costs • For 98/99: unbilled contracts reduced to 5% with unbilled lead time 60 days = R313k saving in interest costs • The total cost saving on more consistent site progress report = R444k

Table 2-2: Asset management Benefits Case Realised

Due to the optimisation efforts resulting from these 3 Benefits Cases, additional capacity was created within Installation & Commissioning. This additional capacity could be used to pursue more installation business and increase sales:

Extension Of Installation Business To All Equipment Orders:	
Idea Identification: Due to capacity constraints, installation work was only offered to 40% of EWSD equipment sold to our biggest Key Account customers (FWKA). The initiatives of reducing catalogue times and reduction of overtime made capacity available, which could be sold to customers in the form of additional installation business.	**Targets definition:** Before 97/98 installation of transmission equipment was not offered to FW Key Account. The Key Account targeted to offer transmission **installation business worth R7m** annually to our FW customers with a net **profit of R'95m**. In addition FW Key Account targeted to increase EWSD installation work from 40% to 60%, which will increase annual **turnover by R7'65m**, and a **profit of R1'03m**.
Procedure: FW Key Account began to constantly offer this service competitively (due to the optimisation of our installation business) to our customer. Monthly turnover of Installation business was measured as a KPI.	**Results:** • For 97/98, FW Key Account increased their **turnover by R52'966m** (because of additional installation business) with a profit of R12'894m. • For 98/99 additional installation work increased **turnover by R57'182m** (against 96/97) with a profit of R12'852m.

Table 2-3: Sales Increase Benefits Case Realised

These four examples not only illustrate the logic used for benefits case creation, but also how benefits cases are inter-linked and can effect each other. This is also a classic example of how an organisation can create more wealth from re-engineering efforts, instead of cutting costs through rationalising capacity.

2.5 EVA Opportunities Conclusion

Robert Kaplan made the following statement on performance measures: "Ideally, companies should specify how improvements in quality, cycle time, quoted lead times, delivery, and new product introduction will lead to higher market share, operating margins, and asset turnover or to reduced operating expenses. The challenge is to learn how to make such explicit linkage between operations and finance." [24. Kaplan] It is this challenge that BPR, or any Change Management project is faced with: to make explicit links between operational improvements and financial benefits. The added dilemma is that such links must be postulated even before a BPR project is initiated, and the financial benefits must be forecasted in order to convince management that the BPR project will pay off.

Therefore, this chapter suggests that possible opportunities must be identified and categorised as sales increase, cost reduction, or asset management initiatives. A benefits case methodology must then be followed to ensure proper quantification, scoreboarding and measurement of opportunities realised. Once a formal procedure is used to identify and track benefits, it increases the credibility and chances of success for BPR.

3 Organisational strategy linked to BPR initiatives

3.1 Organisational strategy introduction

One of the principle teachings of any management handbook is that the objective of a company's management is to maximise the market value of the company. Specifically, the main objective should be to **maximise the wealth of its ordinary shareholders**. [3. CIMA] When formulating a company's strategy, the main targets are to improve the profit, in order to increase the shareholders earnings and dividends. The strategy must balance short term and long term objectives, as well as focussing on important non-financial objectives. Non-financial objectives would include:

- **The welfare of employees**, by trying to provide good wages and salaries, comfortable and safe working conditions, good training and career development, and good pensions.
- **The welfare of management**, even though decisions to improve the circumstances of management will incur expenditure that reduce profits, attracting and maintaining effective managers are critical for organisational success.
- **The welfare of the society as a whole.** As an example, the activities oil companies have a major effect on the environment and they have an obligation to provide for the well being of society by following safe practice.
- **The provision of a service.** Especially in the case of public companies, the main objective is to provide an essential service to the public.
- **The fulfilment of responsibilities towards customers and suppliers.** Quality services or products must be provided to customers and trading relationships must be maintained with suppliers.

A company should ideally try to balance all these objectives to ensure existence. For example: If a company only focus on its short term financial objectives being met by deferring capital investments, or spending small amounts on Research and Development or training, it can be to its long term decrement.

3.2 Chapter Objective

This chapter looks at how to set an organisational strategy by balancing financial and non-financial objectives. In the first section a brief description of Financial Performance Measurements will be given, explaining the reasoning behind financial objectives. The second paragraph is a summary paragraph about Hoshin planning, which is a method to look at setting non-financial objectives. The main topic of this chapter though is the Balanced Scorecard approach. This is a method of establishing

a balanced set of financial and non-financial objectives based on the organisational strategy and a method of achieving it by KPI measuring. This chapter's conclusion will look at how the Balance Scorecard can measure BPR success, as well as the reverse: how the Balanced Scorecard can be used as a vehicle to drive BPR implementation.

3.3 Analysing financial strategy performance

Studying a company's financial performance is the traditional way of assessing company performance. Market and shareholders' interest in the value of companies, usually cause future strategies to be based on activities that will influence financial performance. A company's value can be increased by [3. CIMA]:

- **Increase in share price on the stock market.** If the share price increase, the shareholders' wealth increases.
- **An increase in earnings**, which are the profits attributable to equity. Earnings Per Share (EPS) are the earnings attributable to each equity share.
- **If earnings and dividends increase, management can hope for an increase in the share price.** Shareholders benefit from higher share prices and higher dividends.
- **Dividends are the direct reward to shareholders that a company pays out,** thus dividends are evidence of a company's ability to provide a return for its shareholders.

Shareholders use Earnings per Share (EPS) and Price per Earnings (P/E) ratios to interpret the worth of share prices and the return expected from shares. Unfortunately the interpretation thereof is dependant on various 'things', in the words of Alan Abelson (1976) "...P/E's in a way like sausages – lots of stuff goes into the making of them, not all of it identifiable." [14. Fiber]
The main factors used by shareholders to evaluate the performance of a company, which managers set targets for improving are [2. Brealy et al]:

- **P/E ratio = Share Price / Earnings per Share** - The P/E-ratio are often looked at when to see what investors think of a share and what they are prepared to pay for each Rand of earnings. A high P/E ratio suggest that investors think the stock has good growth opportunities and its earnings are relatively safe. But then, it could also mean that earnings are temporarily low.
- **EPS growth = (EPSt – EPSt-1) / EPSt-1** - EPS figures for consecutive years are compared with each other to determine EPS growth and thus company growth. [20. Hamman]
- **ROE = Net Profit after tax / Capital Employed** – This figure is a direct indication of the Return on Equity the shareholders are receiving, and the sustainability of this figure is of importance.
- **Sales to Net working Capital = Sales turnover / Capital employed** – the growth of this ratio indicates by how much this company have expanded and what is the growth in totality.

- **Net Profit Margin = Net Profit before Interest and Tax (EBIT) / Sales turnover** – this figure provide the total profitability of the company and by measuring the growth of this figure, the internal productivity of this company can be measured.

The following ratios are used by managers to establish a company's financial operation [2. Brealy et al]:

- **Current ratio = Current assets / Current liabilities** – this is roughly a measurement of a companies cash reservoir.
- **Cash ration = (cash + short term securities) / Current liabilities** – this is an indication of a company's cashflow.
- **Sales turnover / Inventory** – this ratio gives an indication of how well the company manage its short-term assets, and if productivity is improving in this aspect.
- **Sales turnover / Debtors value** – this ratio also indicates the efficiency of the company, but especially in terms of cash management which is also connected to short term assets.

To make sense of these ratios, benchmarks are needed for assessing a company's financial position. Usually comparison to the previous year's ratios, or ratios of other firms in the same business will make sense.

This is the conventional way of assessing company performance, by studying its financial results. Financial ratios seldom provide answers, but they do help to ask the right questions. They are direct measurements of a company's value, but to base company strategy on only financial ratios, is dangerous because it is based on historical data. To set a strategy and drive improvement, companies need to look at operations that effect the future. Over the last two decades, commentators have built up a case to suggest that such a single focus is myopic, because financial plans, goals and outcomes are influenced by the values, beliefs and behaviours of the people who make up the organisation.

3.4 Hoshin Planning

Management of an organisation has as one of its principal responsibilities the task to set the direction of the organisation for the future and to move the entire organisation into that future. The most effective way to set the future direction is to develop a shared vision of what the organisation will be in the future, contrast it to the way the organisation is now, and then create a plan for bridging the gap: the Strategic Plan. The challenge is to implementing this Strategic plan. For this purpose some organisations have made use of a concept called Hoshin Planning.

Developed in Japan in the 1960s, Hoshin Planning is a management system for determining the appropriate course of action for an organisation, and effectively accomplishing the relevant actions and results. The original Japanese concept: Hoshin Kanri, translated literally means direction needle management, administration or deployment. [8. Oakland et al]

Hoshin Planning help to

- Determine **Critical Success Factors** of the Strategic Plan,
- Establish **long-range Goals**,
- **Prioritise** Improvement Actions, and
- Set Improvement **Targets**.

[39. Brecker] Once an organisation has defined its vision, it needs to set a number of goals, which when achieved, would realise this vision. To achieve these goals, an organisation has to set strategic directions and initiate improvement projects to achieve its goals. The X-Matrix below is used to ensure the **alignment** of annual business plans and annual improvement projects with strategic directions.

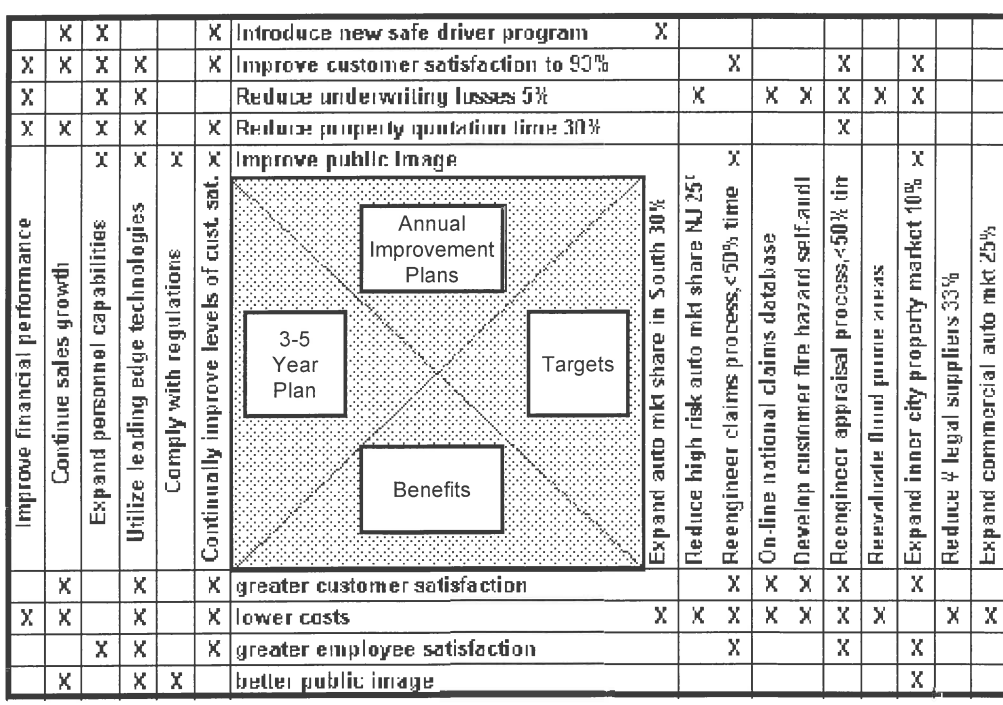


Figure 3-1 The Hoshin Planning matrix [39. Brecker]

This Hoshin Planning matrix helps to identify:

- Which were the activities critical to attaining the goals;
- Which of the existing improvement activities were already aligned with the goals;
- Which goals were not going to be achieved without realigning effort;
- How to prioritise the improvement effort.

When focussing on the goals, all stakeholders in the organisation namely: revenue customers, employees, the general public, and shareholders must also be considered. Each goal has a measure, and each measure a target, which is challenging, yet achievable. Figure 3-2 below illustrates such goal deployment right down to process level.

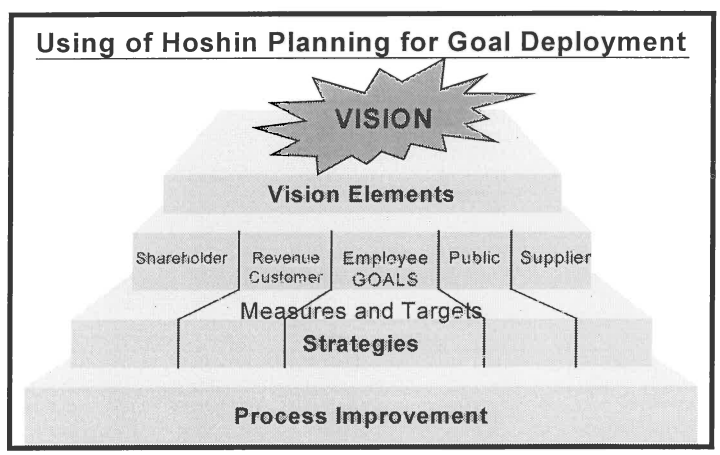


Figure 3-2 Hoshin Planning Goal Deploying [8. Oakland et al]

Top management need to gain buy-in and involvement from the lower levels of the organisation. This is done with a "catch-ball" process, which helps to achieve **consistency** with other levels in the organisation. The next-level-down managers have to take the goals and measures developed by top management and develop a set of strategies to achieve these goals. If they are unable to set strategies to impact the measures given, then this is feedback to the higher level management. Figure3-3 below illustrates the two-way communication required throughout the organisation about goals, measures and strategies. The strategies of one layer of management became the goals of the next level down.

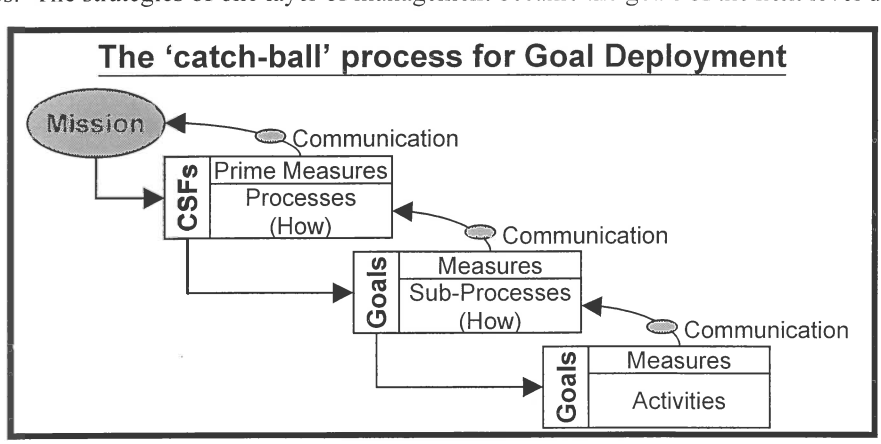


Figure 3-3 Catch-ball process for Goal deployment [8. Oakland et al]

3.5 The Balanced Scorecard approach

What you measure is what you get. Senior executives understand that their organisation's measurement system strongly affects the behaviour of managers and employees. This causes the concern of measuring the performance of those objectives that will help an organisation obtain its vision.

It is known that traditional financial accounting measures like return-on-investment and earnings-per-share can give misleading signals about continuous improvement and innovation. Financial measures are widely criticised because of their backward-looking focus, and their inability to reflect pro-active value-creating actions.

Intense global competitiveness force organisations to search for new systems of performance measuring. A 1998 study by the Gartner Group found that "at least 40 % of Fortune 1000 companies will implement a new management philosophy...the Balanced Scorecard... by the year 2000." [48. US Dept. of Commerce]

The balanced scorecard is a conceptual framework for translating an organisation's strategic objectives into a set of performance indicators distributed among four perspectives: Financial, Customer, Internal Business Processes, and Learning and Growth. [24. Kaplan]

It maintains critical financial measures that tell the results of actions already taken. But it complements the financial measures with operational measures on customer satisfaction, internal processes, and the organisation's innovation and improvement activities, which are operational measures that are the drivers of future financial performance.

Some indicators are maintained to measure an organisation's progress toward achieving its vision; other indicators are maintained to measure the long term drivers of success. Through the balanced scorecard, an organisation monitors both its current performance (finance, customer satisfaction, and business process results) and its efforts to improve processes, motivate and educate employees, and enhance information systems—its ability to learn and improve.

Robert Kaplan, professor of Accounting at Harvard Business School, and David Norton, president of an information technology consulting firm (Nolan, Norton & Company Inc.) were the creators of the balanced scorecard. In their first article about the balanced scorecard in 1992 they associated it with the dials and indicators in an aeroplane cockpit. For the complex task of navigating and flying an aeroplane, pilots need detailed information about many aspects of the flight. They need information on fuel, air speed, altitude, bearing, destination, and other indicators that summarise the current and predicted environment. Reliance on one instrument can be fatal. [24. Kaplan]

In the same way the balanced scorecard brings together, in a single management report, many of the seemingly disparate elements of a company's competitive agenda: becoming customer oriented, shortening response time, improving quality, emphasising teamwork, reducing new product launch times, and managing for the long term. In addition it also guards against sub-optimisation. By forcing

senior managers to consider all the important operational measures together, the balanced scorecard lets them see whether improvement in one area may have been achieved at the expense of another.

3.5.1 The four perspectives of the Balanced Scorecard

The balanced scorecard allows managers to look at the business from four important perspectives.

It provides answers to four basic questions:

1. How do customers see us? (customer perspective)
2. What must we excel at? (internal perspective)
3. Can we continue to improve and create value? (learning and growth perspective)
4. How do we look to shareholders? (financial perspective)

3.5.1.1 Customer Perspective: How should we appear to our customers?

Many companies today have a corporate mission that focuses on the customer, for example "To be number one in delivering value to customers". The balanced scorecard demands that managers translate their general mission statement on customer service into specific measures that reflect the factors that really matter to customers. Customers' concerns tend to fall into four categories: time, quality, performance and service, and cost.

- Lead-time measures the time required for the company to meet its customers' needs.
- Quality measures the defect level of incoming products as perceived and measured by the customer. Quality could also measure on-time delivery, the accuracy of the company's delivery forecasts.
- The combination of performance and service, measures how the company's products or services contribute to creating value for its customers.

To put the balanced scorecard to work, companies should define goals for time, quality, and performance and service and then translate these goals into specific measures.

3.5.1.2 Internal Business Perspective: What business processes must we excel at?

Customer-based measures are important, but they must be translated into measures of what the company must do internally to meet its customers' expectations. After all, excellent customer performance derives from processes, decisions, and actions occurring throughout an organisation. Managers need to focus on those critical internal operations that satisfy customer needs. The second part of the balanced scorecard gives managers that internal perspective. The internal measures for the balanced scorecard should come from the business processes that have the greatest impact on customer satisfaction, such as factors that affect cycle time, quality, employee skills, and productivity.

Companies should also attempt to identify and measure their organisation's core competencies, the critical technologies needed to ensure continued market leadership. Since much of these operations take place at the department and workstation levels, managers need to decompose cycle-time, quality, product, and cost measures to operational levels. That way, the measures link top management's perception about key internal processes and competencies to the actions taken by individuals that affect overall corporate objectives. This linkage ensures that employees at lower levels in the organisation have clear targets for actions, decisions, and improvement activities that will contribute to the company's overall mission.

3.5.1.3 Learning and Growth: How will we sustain our ability to change and improve?

The customer and internal business process measures on the balanced scorecard identify the parameters that the company considers most important for competitive success. But the targets for success keep changing. Intense global competition requires that companies make continual improvements to their existing products and processes. Only through the ability to launch new products, create more value for customers, and improve operating efficiencies continually, can a company penetrate new markets and increase revenues and margins, which cause growth and increase in shareholder value. The company estimates specific rates of improvement for on-time delivery cycle time, defect rate, and yield. An example of learning, or improvement would be to measure process defects, missed deliveries, and scrap, and to aim to reduce it by a factor of ten over four years. These targets emphasise the role for continuous improvement in customer satisfaction and internal business processes.

3.5.1.4 Financial Perspective: How should we appear to our shareholders?

Financial performance measures indicate whether the company's strategy, implementation, and execution are contributing to bottom-line improvement. Financial measures can be simple, yet relevant: Cash flow indicates survival, success is measured by quarterly sales growth and operating income by division, and prosperity by increased market share by segment and return on equity.

Critics of financial measures might argue that the terms of competition have changed and that traditional financial measures do not improve customer satisfaction, quality, cycle time, and employee motivation. But, financial performance is the result of operational actions, and financial success should be the logical consequence of doing the fundamentals well. Thus the argument state that by making fundamental improvements in their operations, the financial numbers will take care of themselves. Though, making the assumption that financial measures are unnecessary is incorrect for at least two reasons. A well-designed financial control system can enhance, rather than inhibit an organisation's total quality management program. More important, however, the assumed linkage between improved operating performance and financial success is actually quite tenuous and uncertain.

If improved performance fails to be reflected in the bottom line, executives should reassess the basic assumptions of their strategy and mission. Not all long-term strategies are profitable strategies.

Measures of customer satisfaction, internal business performance, and growth and improvement are derived from the company's particular view of the world and it's perspective on key success factors. But that view is not necessarily correct. Even an excellent set of balanced scorecard measures does not guarantee a winning strategy. The balanced score card can only translate a company's strategy into specific measurable objectives. [24. Kaplan]

Periodic financial statements remind executives that improved quality, response time, productivity, or new products benefit the company only when they are translated into improved sales and market share, reduced operating expenses, or higher asset turnover. Thus the reactive financial perspective is the true test to the pro-active customer, internal, and growth and learning perspectives.

The illustration below indicates how the four perspectives link.

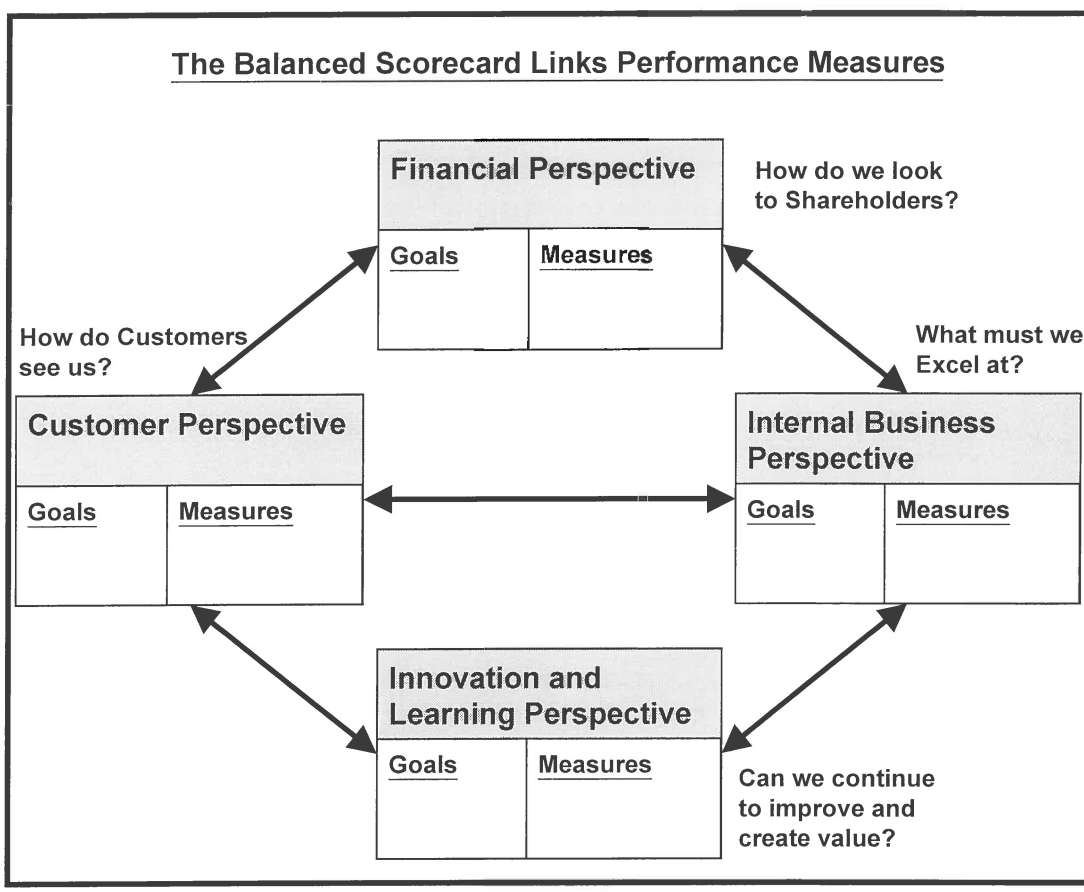


Figure 3-4 Four perspectives of the Balance Scorecard [24. Kaplan et al]

In the example of Sietel's Installation and Commissioning department, they had the following goals for the four Balanced Scorecard perspectives:

- Customer satisfaction must be ensured through completing projects on time, and having no defects when final acceptance testing is done.
- Internal Process objectives were to reduce the amount of overtime spend on projects through better activity planning and improved interaction with logistics processes.

- As a Learning and Growth objective Installation and Commissioning was to constantly reduce their standard times required to perform installation activities.
- The Financial objective was to reduce cost overruns on projects because of overtime paid.

Figure 3-5 illustrates these objectives in Balanced Scorecard fashion, with related KPI's for each objective.

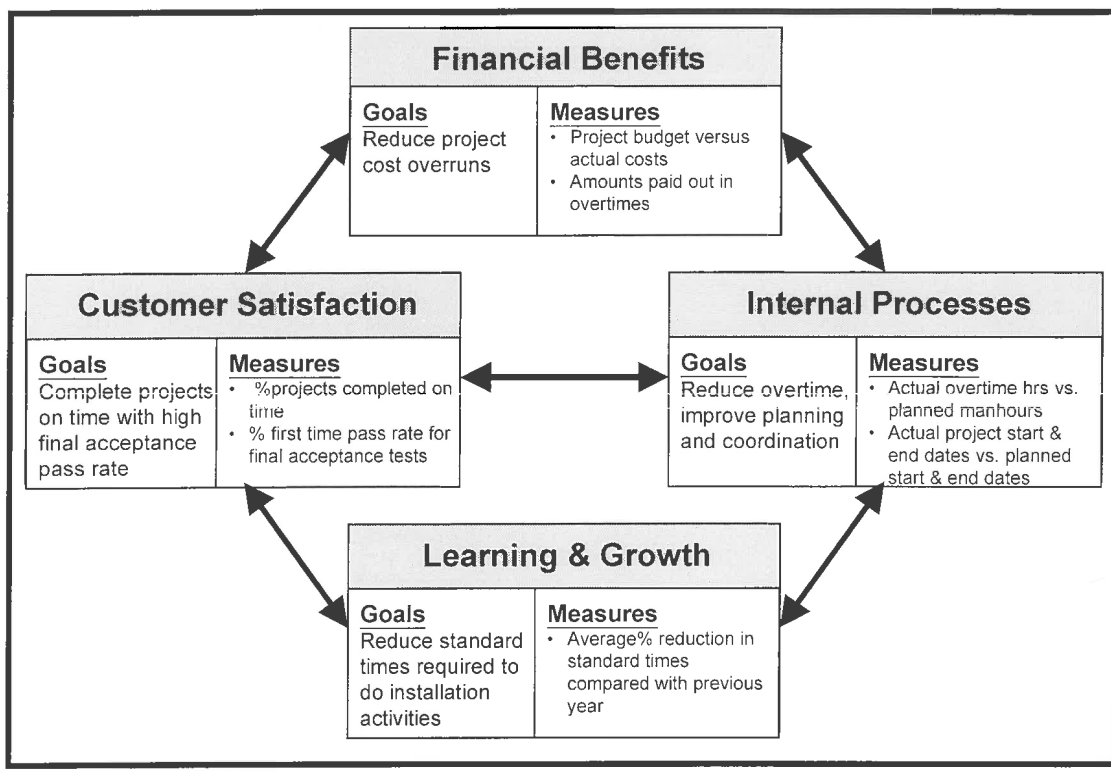


Figure 3-5 Installation & Commissioning objectives in Balanced Scorecard fashion.

3.5.2 Implementation Method for the Balanced Scorecard

The US department of commerce have set down the following 3-step procedure for implementing a balanced scorecard within their procurement agency [48. US Dept. of Commerce]

3.5.2.1 Define Organisational Vision, Mission, and Strategy

Firstly the Balanced Scorecard methodology requires the creation of a vision, mission statement, and strategy for the organisation. This ensures that the performance measures developed in each perspective support accomplishment of the organisation's strategic objectives. It also helps employees visualise and understand the links between the performance measures and successful accomplishment of strategic goals.

The key, as pointed out by Kaplan and Norton, is to first identify where you want the organisation to be in the near future.

3.5.2.2 Develop Performance Objectives, Measures, and Goals

Next, it is essential to identify what the organisation must do in order to attain the identified vision. For each objective that must be performed well, it is necessary to identify measures and set goals covering a reasonable period of time.

The organisation's vision must be translated into a set of performance objectives distributed among four perspectives: Financial, Customer, Internal Business Processes, and Learning and Growth. Some objectives are maintained to measure an organisation's progress toward achieving its vision. Other objectives are maintained to measure the long term drivers of success. Through the use of the Balanced Scorecard, an organisation monitors both its current performance, and its ability to learn and improve. Figure 3-6. below indicates matrices used in the Balanced Scorecard methodology to help develop objectives and measures. The matrices are relatively straightforward and easy to understand. However, developing the contents of each matrix is the hard part. [26. Kaplan et al]

When creating performance measures, it is important to ensure that it link directly to the strategic vision of the organisation. The measures must focus on the outcomes necessary to achieve the organisational vision and the objectives of the strategic plan. When drafting measures and setting goals, ask whether or not achievement of the identified goals will help achieve the organisational vision.

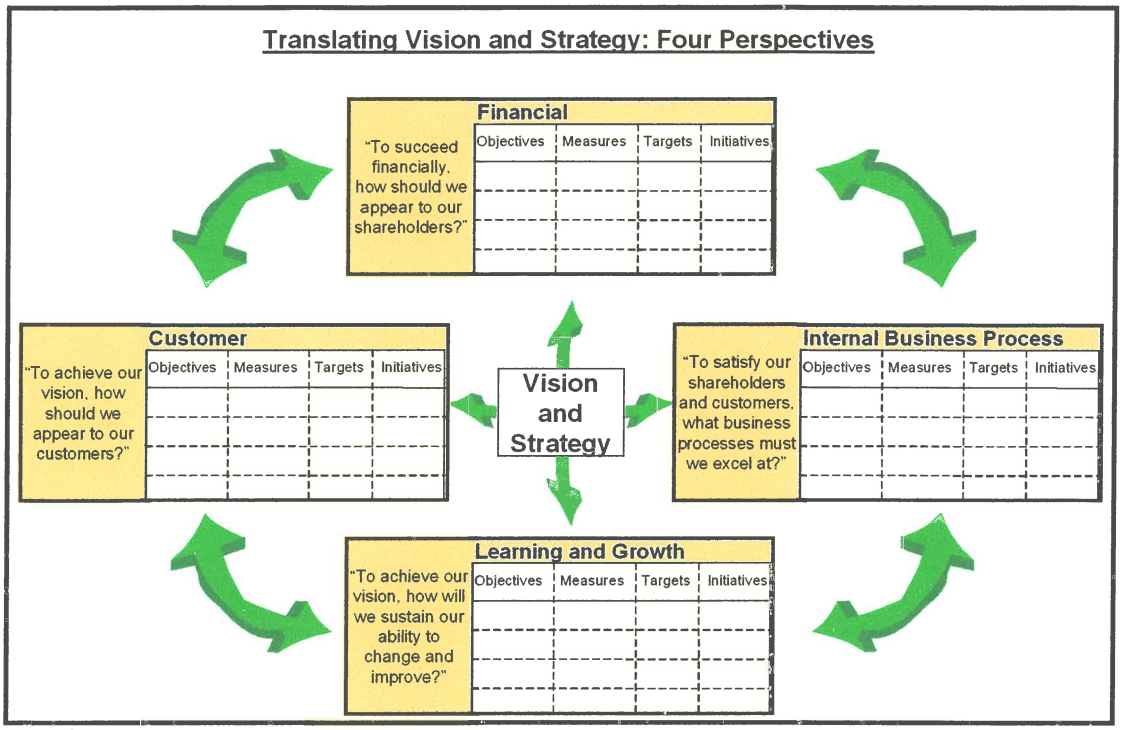


Figure 3-6 Matrices to develop Balanced Scorecard perspectives [26. Kaplan et al]

Each objective within a perspective should be supported by at least one measure that will indicate an organisation's performance against that objective. Define measures precisely, including the population to be measured, the method of measurement, the data source, and the time period for the measurement.

When developing measures, it is important to include a mix of quantitative and qualitative measures. Quantitative measures provide more objectivity than qualitative measures. They may help to justify critical management decisions on resource allocation (e.g., budget and staffing) or systems improvement. An organisation should first identify any available quantitative data and consider how it can support the objectives and measures incorporated in the Balanced Scorecard. Qualitative measures involve matters of perception, and therefore of subjectivity. Nevertheless, they are an integral part of the Balanced Scorecard methodology. Judgements based on the experience of customers, employees, managers and contractors offer important insights into operational performance and results. Achieving a balance among quantitative and qualitative factors (as well as among process-oriented and results-driven measures) is crucial in developing a valid Balanced Scorecard methodology.

3.5.2.3 Evolve With Experience

Finally, it takes time to establish measures, but it is also important to recognise that it might not be perfect the first time. Implementing a Balanced Scorecard is an evolutionary process that requires adjustments as experience is gained in the use of its performance measures.

3.5.3 Critical Success Factors (CSF) for implementing a Balanced Scorecard

An organisation's environment, values and behaviours will govern how easy or difficult it will be to successfully implement a balanced set of performance measures. The following paragraphs will highlight critical success factors that must be reckoned with during the design, implementation and use of a Balanced Scorecard.

3.5.3.1 Culture

Michael Morrow, of KPMG, warns of potential scorecard implementation barriers because of: *"managers...who were reluctant to drop the old financial measurement regime and a danger that initial euphoria (about the scorecard) will evaporate if the culture of the company is one that always expects instant results."* [28. McCunn]

3.5.3.2 Commitment

A Balanced Scorecard needs to be endorsed by top management, particularly the Chief Executive. Robert Kaplan described how he diplomatically says he is too busy to help if anyone other than the CEO rings up to ask for his help in implementing a scorecard. This is not arrogance or conceit on Kaplan's part - he recognised that *"...assigning a task force won't get the job done. In organisations that have been successful, the new scorecard was viewed as a key strategic initiative by the chief of that business unit."* [25. Kaplan et al]

3.5.3.3 Design

Two of the main design features which commentators say should promote successful scorecard implementation are:

- Involvement of senior managers in the design,
- and linkage of the scorecard to the company's strategic direction.

Michael Morrow stresses the importance of giving busy managers time to agree what is needed and also allowing them freedom to customise their own scorecard to be more relevant to the division where they work. [38. Athena Consulting]

3.5.3.4 Implementation and Use

Kaplan himself takes the view that *"the balanced scorecard is most successful when it's used to drive the process of change."* He cites, amongst others, the experience at Barclays Bank, where they found the scorecard to be invaluable as a means of reaching consensus, during a change period, on what were the priority areas for achievement and improvement. [25. Kaplan et al]

The table below is a roadmap for Balanced Scorecard implementation by Athena Consulting. It identify Critical Success Factors for a Balanced Scorecard with ideal situations and actions that can be taken to ensure CSF are addressed.

A Roadmap for Introduction of a Successful Balanced Scorecard within Financial Services

STEP	IDEAL SITUATION (Key issues only)	COMMENTS (If ideal situation not present)
Understand your company's characteristics · eg. the need to consider the needs of all stakeholders	Be a large company, employing more than 5,000 staff. Have been implementing Total Quality for at least 4 years	There is nothing you can do in the short term about these situational factors. However, you can understand how the underlying issues might be relevant to your company -
↓		
Recognise your company's culture · program	Company inclined to take "the long view" Has a future, rather than past, orientation	Discuss with senior managers the need for a Strategic Review including a refocus of Mission, Vision, Values. Consider launch of TQM, including management behaviours.
↓		
Gain buy in and commitment from key managers	Chief Executive visibly committed and using scorecard Other senior managers and "key influencers" actively use it	Ensure CEO sincere initial buy in. Ask CEO to personally launch. Ensure commitment widely publicised. Ask key influencers to help design
↓		
Design scorecard appropriately	Managers are involved in scorecard design and refinement Scorecard relevant to function Focus on "what" to measure not "how" it should be delivered	Carefully choose design team. Test relevance (to level and function) at all times. Allow time for refinement. "Ride hard" on those seeking sophisticated IT solutions
↓		
Implement carefully and use effectively	Use scorecard to drive through change Consider scorecard as part of wider management system Use to set meetings agenda	Test use deployment and understand reasons where scorecard not being used. Ensure scorecard quadrants enter company vocabulary

Table 3-1 A Roadmap to implementing the Balanced Scorecard [38. Athena]

3.5.4 Balanced Scorecard operation as a Management System.

Once an organisation adopted and implemented a balanced scorecard, Kaplan and Norton suggest the introduction of four new management processes that, separately and in combination, contribute to linking long-term strategic objectives with short-term actions. These four management processes are illustrated in figure 3-7 below.

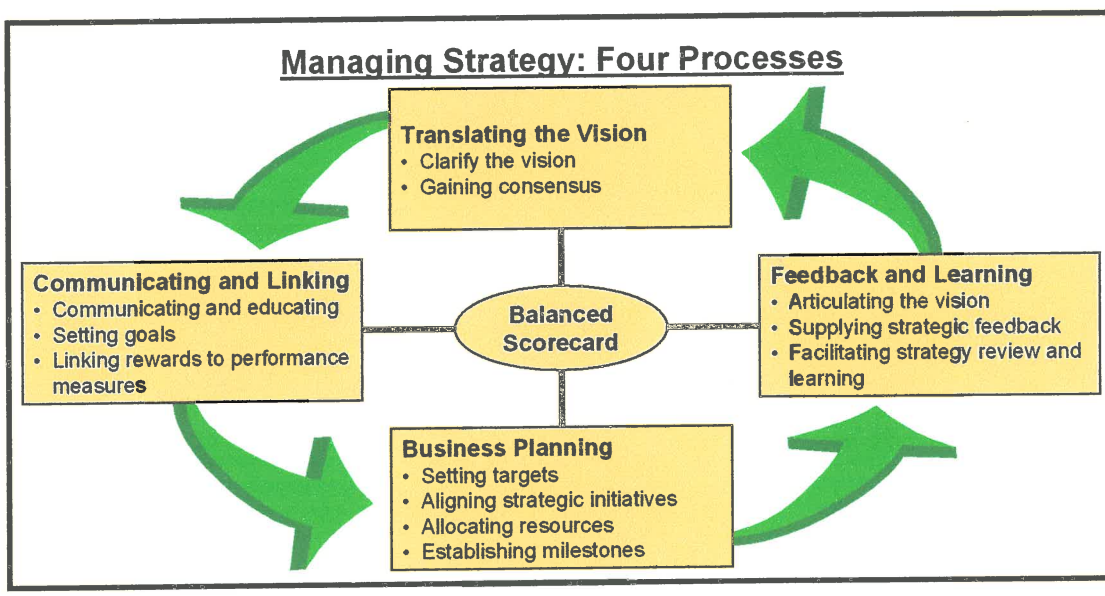


Figure 3-7 The Balanced Scorecard Operation processes [26. Kaplan et al]

3.5.4.1 Translating the vision

Even if a group of top managers agree on every word in a vision statement, each manager may still have a different definition for the words and phases in the vision. This first process helps managers build a consensus around the organisation's vision and strategy by developing operational measures for the four perspectives of the balanced scorecard. For people to act on the words in the vision and strategy statements, those statements must be expressed as an integrated set of objectives and measures that describe the long-term drivers of success. Thus creating a balanced scorecard force senior managers to arrive at a consensus and then to translate their vision into terms that have meaning to the people who would have to realise the vision.

3.5.4.2 Communicating and linking

The Balanced Scorecard signals to everyone what the organisation is trying to achieve for its shareholders and customers, but to align employees individual performances to the strategy, the following three activities must be done:

- Communicating and Educating – From management's side, they need to initiate a broad based communication program to share with all employees the strategy, with the critical objectives that have to be met, if the strategy is to succeed. In return business units can quantify and communicate their long term strategies to senior executives using similar comprehensive sets

of linked financial and non financial measures. These measures will from the basis for feedback and accountability.

- Setting Goals – Senior Management has to do more than merely create awareness of corporate goals, they have to translate the goals down to operating units and individual levels. Business Unit, departmental and even individual scorecards can be used to disseminate corporate goals into the organisation.

- Linking Rewards to Performance measures - Tying financial compensation to performance is a powerful lever, and some companies have moved quickly to establish such a linkage to reward balanced scorecard performance. As attractive and as powerful as such linkage might be, it nonetheless carries risks. For instance, does the company have the right measures on the scorecard.

3.5.4.3 Business Planning

The very exercise of creating a balanced scorecard forces organisations to integrate their strategic planning and budgeting processes and therefore helps to ensure that budgets support strategies. To do business planning, scorecard users (senior executives or departmental managers) must select measures of progress from all four-scorecard perspectives and set targets for each. Then they have to determine which actions will drive them toward their targets, identify the measures they will apply to those drivers, and establish the short-term milestones that will mark their progress along the strategic paths they have selected. At the end of the business planning process, managers should have set targets for the long-term objectives they would like to achieve in all four scorecard perspectives. They should also have identified the strategic initiatives required and allocated the necessary resources to those initiatives. Finally scorecard users have established milestones for the measures that mark progress toward achieving their strategic goals. Building a scorecard thus enables a company to link its financial budgets with its strategic goals.

3.5.4.4 Feedback and Learning

The capability that the scorecard should give senior managers is the ability to know at any point in its operation, whether the strategy they have formulated is, in fact, working, and if not, why. The first three management processes – translating the vision, communicating and linking, and business planning – are vital for implementing strategy, but they are not sufficient in an unpredictable world. Together they form an important single-loop-strategic-learning process. Strategic learning consists of gathering feedback, testing the hypotheses on which strategy was based, and making the necessary adjustments. The Balanced Scorecard approach facilitates strategic learning in three ways:

1. First, it articulates the company's shared vision, defining in clear and operational terms the results that the company, as a team, is trying to achieve.

2. Second, the scorecard supplies the essential strategic feedback system. A business strategy can be viewed as a set of hypotheses about cause-and- effect relationships. A strategic feedback system should be able to test, validate, and modify the hypotheses embedded in a business unit's strategy.

3. Third, the scorecard facilitates the strategy review that is essential to strategic learning.

The balanced scorecard, with its specification of the relationships between performance drivers and objectives, allows corporate and business unit executives to periodically evaluate the validity of the unit's strategy and the quality of its execution.

3.6 Linking organisational strategy to BPR conclusion

This chapter started of by looking at traditional financial measurements used to rate strategic organisational performance. The industry concern is that this type of measurement is myopic and reactive. Hoshin Planning on the other hand, is a strategy deployment methodology that focuses on more areas than just shareholders interest. It also provide means of disseminating strategy into the organisation and getting feedback on strategy achievement, but it does not suggest the necessary links between operational objectives and financial performance. The Balanced Scorecard is a strategy mobilisation philosophy that balance internal operation efforts with customer satisfaction and ultimately financial performance. It translates organisational vision into operational objectives and goals for four perspectives: customer perspective, internal perspective, learning and growth perspective, and financial perspective. KPI measurements from the lower level units in the organisation provide feedback on the ability to meet the operational objectives and goals. Testing operational performance against financial wellbeing checks the soundness of the organisational strategy and if the correct approach is being followed.

From the paragraph on CSF for implementing a Balanced Scorecard, it was implied that the implementation of a Balanced Scorecard and BPR strongly compliments each other. Kaplan states that *"the balanced scorecard is most successful when it's used to drive the process of change"*. [25. Kaplan et al] McCunn called the Balanced scorecard "*The Trojan Horse*" for change projects. [28. McCunn] As mentioned Balanced Scorecard implementation cause:

- A culture change – the traditional means of measuring performance does not apply anymore and managers are required to take a new perspective on their business.
- Indicates top management commitment – if the CEO himself is interested in how internal business processes measures and how it improves, it indicates serious interest in optimisation.
- Communication of business objectives – by reaching consensus on, and translation of the vision into operational objectives, the organisation gains understanding in the reasons for change.

- Designing of appropriate KPI's – by being involved in defining objectives and measures for departmental scorecards, managers have to report back on KPIs that focuses on process improvement, which is also one the main outcomes of BPR.

These are all enablers to create an ideal situation for BPR.

On the other hand, Kaplan states that the process of building a balanced scorecard, clarifying the strategic objectives and then identifying the few critical drivers, also creates a framework for managing an organisation's various change programs. Initiatives such as BPR, employee empowerment, total quality management, among others promise to deliver results, but also compete with one another for scarce resources, including the scarcest resource of all: senior managers' time and attention. [25 Kaplan et al] Once the strategy is defined and the drivers are identified, the Balanced Scorecard influences managers to concentrate on improving or re-engineering those processes most critical to the organisation's strategic success.

When implemented, the Balanced Scorecard's four perspectives are direct measures on BPR initiatives. Re-engineering success should reduce lead-times and costs, and improve productivity, quality and service performance of critical process. This will be indicated in measures of the internal business, and learning and growth perspectives, as well as spin-offs on customer perspectives. Measures on financial performance should align with the benefits cases for BPR.

Thus, by creating the ideal framework for BPR, and focussing on KPIs, the Balanced Scorecard most clearly links and aligns re-engineering actions with strategy.

4 BPR Methodologies

4.1 Introduction to BPR

Business Process Re-engineering (BPR) is a process of radically changing organisational structures in a short period of time. The objective of the radical change is to innovatively redesign the organisation to perform its business as effectively as possible in line with operational strategies, while at the same time bringing about cost reductions and improved processes and systems. Michael Hammer defines re-engineering as "the fundamental rethinking and radical redesign of business processes to achieve dramatic improvements in critical, contemporary measures of performance, such as cost, quality and speed". [4. Hammer et al] Chase and Aquilano identified the following 6 step approach to BPR [1. Aquilano et al]:

1. State a case for action. Analysis of the organisation have to be done and a need for action have to be defined with a vision.
2. Identify the processes for re-engineering. The processes that will deliver the greatest opportunities from re-engineering must be identified. A project scope with costs must be identified and compared to cost savings that is summarised in a business case for BPR.
3. Evaluate Enablers for re-engineering. Creative applications must be identified with which existing processes can be redesigned and enhanced. Aspirational Business processes are defined with "Could-Be" models.
4. Understand the current processes by means of 'As-Is' and 'Should-Be' analysis.
5. Create a new process design with "To-Be" models.
6. Implement the re-engineered process. Relevant processes can be tested with a pilot to review the designed 'To-Be' processes, or implementation can be planned for processes that do not need pilots. Finally, full scale implementation and embedding of the 'To-Be' processes in the organisation.

4.2 Chapter Objective

A generic BPR methodology, as proclaimed by a re-engineering consulting company, will first be examined in this chapter. In addition useful BPR tactics, tools and interventions will be explained with hints for practical use. Note that these tools discussed are practical of nature, with no special software packages needed, which makes it even more useful. Experiences from the process and method followed within the Sietel BPR case study will then be given, demonstrating the fusion between theory and practice.

4.3 Generic BPR Methodologies

4.3.1 Consultant's Generic BPR approach.

The Sietel case study, which will later be discussed in detail, mention the use of a consultation company. Because BPR is such a well defined topic in the literature, it will often be found that various consultation companies use the same high-level approach to BPR. These companies distinguish themselves in the business contracts they provide to their customers and the detail customisation of methodologies during design and implementation.

Gemini consulting distinguish between what they call their overall approach, and methods, tools and interventions utilised during BPR. They have a fairly straightforward high level approach which is segmented into 4 phases namely Business Development, Analysis & Design, Results Delivery, and Embedding & Sustaining [16. Gemini].

4.3.1.1 Business Development

Gemini's model of business development is based on account development with a client, and relationship management. As can be seen from the diagram below, the objective is to identify various types of opportunities for themselves and their clients and then selectively pursue these.

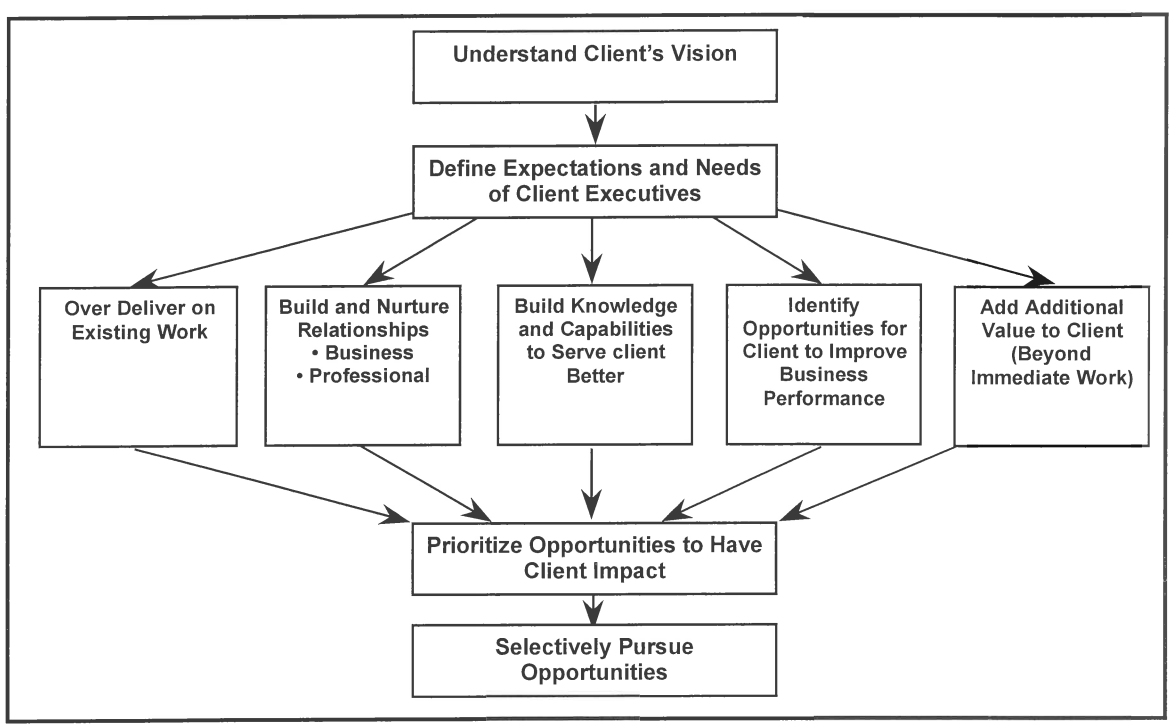


Figure 4-1 Gemini's model of business development. [16. Gemini]

4.3.1.2 Analysis & Design

The primary function of the Analysis and Design phase is to develop a rationale for change with the client by means of identifying opportunities for BPR. The main activities during this phase are:

1. Set-up and onboarding of the joint client - Gemini analysis team.
2. Preliminary process mapping.
3. Hypothesis development which are studied and tested.
4. Deep drills into processes and data mining.
5. Development of an opportunity chart that gets validated, consolidated and formed into benefits cases.
6. BPR project design and costing
7. Presentation of costs versus benefits analysis to the client in the form of a business case.

4.3.1.3 Results Delivery

The Results Delivery phase only continue when the client agreed with the business case and negotiated a contract with Gemini for a BPR project. This project is very much directed by the scope, which was generally indicated in the Analysis & Design phase. Management of the project in this phase needs to be flexible and situational driven though. The main activities during this phase are:

1. Set-up and onboarding of the BPR project team.
2. Validation of the Analysis & Design findings.
3. Detailed mapping of the current processes.
4. Redesign of these processes and validation by the organisation of the new processes.
5. Implementation of the new processes
6. Benefits delivery and tracking of defined opportunities from BPR.
7. Constant project re-alignment as necessary.

4.3.1.4 Embedding & Sustaining

In this final phase the new processes are handed over to the process owners. The organisation then needs to accept the ownership of these processes and embedding are ensured through an existing loop of Plan - Do - Review which later leads to continuos improvement. Ongoing benefits tracking and support of the new processes are continued. The sustainability of the new processes are measured by means of quality audits.

4.3.2 Methods, Tools and interventions

As mentioned, within this consultant's approach various methods, tools and interventions are used. These are not only restricted to a single phase, but are continuously used through out the re-engineering project and implementation.

4.3.2.1 Onboarding

Every group or team of client employees (and consultants) that get involved in the BPR project, have to go though an onboarding process. The objectives of this onboarding are:

- to set the scene for these people to work as a project group since all come from different functional departments;
- to present the expectations from the team to ensure understanding of BPR, what their roles will be in the process, and what the objectives will be for the BPR project;
- to explain the terminologies of BPR such as what is the concept of BPR, some BPR tools namely Brown Papers, Plan-Do-Review (PDR), Responsibility, Accountability, Consulted, Informed (RACI's), Key Performance Indicators (KPI's) and how the process of facilitating works.
- to explain what paradigms are, its role in organisations, and how BPR must overcome paradigms.
- the team is introduced to their coach, who is one of the directors of the company, and the interaction with the coach is explained.
- The team finally has to draw their own charter and time-line for the objectives, deliverables, scope and milestones of the BPR project.

Onboarding is therefore a team building exercise for the project team, as well as education for the task of BPR and understanding the methodology that have to be followed to reach objectives and deliverables.

4.3.2.2 Brown Paper (BP) Methodology

Brown Paper (BP) Methodology is one of the simplest but one of the most effective tools in Business Process Re-engineering (BPR). The definition for a BP is as follows:

"It is a pictorial representation of a process, detailing and highlighting interfaces, decision points and information sources" [17. Gemini]

4.3.2.2.1 The objectives of a Brown Paper

- Describe the realistic process flow as it works (it shows the 'big picture').
- Helps identify the strengths and opportunities of the process, as well as capturing the complexity of operational issues.
- Gains support for validation of opportunities or suggested solutions (in To-Be models) by developing ownership through participation.
- Describes the link between the process flow and measurable elements such as time, volumes, resource capacities, costs, etc.

4.3.2.2.2 The benefits and uses of a Brown Paper

Because a BP process flow is a "high-touch, low-tech" tool, it is easily understood by all people, as opposed to conventional process flow charts where most participants simply "switch-off" when being presented. Thus high organisational involvement and ownership is possible when processes are validated and opportunities are identified.

Building Brown Papers is the most useful tool during the analytical phases of a project in order to study the "current situation", or when presenting results such as the designed "future process". Typically, Brown Papers are built for:

- As-Is processes (the current situation)
- Should-be processes (the situation according to the procedure)
- Could-be processes (the aspirational situation for the future)
- 'To-Be' processes (the desired situation for implementation)

4.3.2.2.3 The typical elements used in a Brown Paper

- Tasks (square shape) that describe tasks performed. The definition starts with an action verb.
- Decisions (diamond shapes) which describe a decision taken with a 'yes' and 'no' outcome.
- Links to other processes (cloud shapes) which describe a link to another process flow that is out of scope or on another BP.
- Findings (flag shapes) which indicate where major opportunities exist.
- Live documents (a copy of the document itself) which show the documents used in the process. These can be in the form of reports, delivery notes, computer screen printouts, etc.

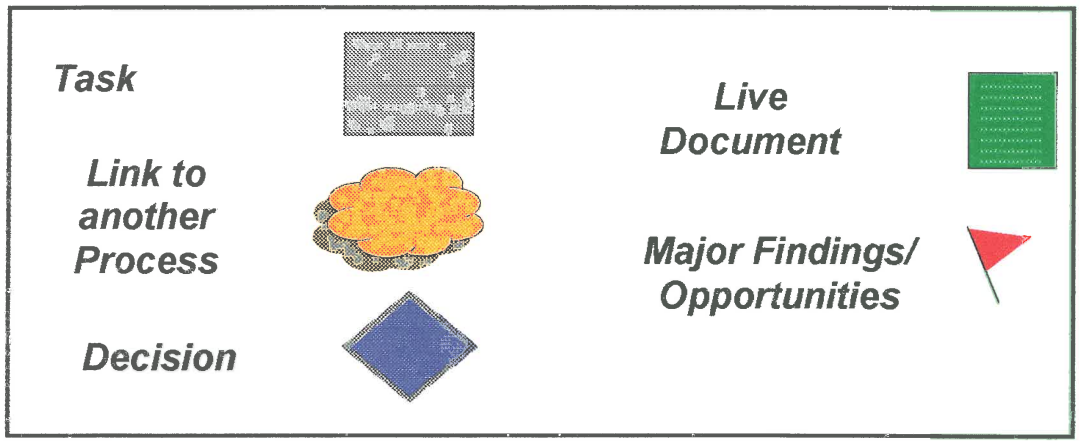


Figure 4-2 Elements used in Brown Paper process flows.

4.3.2.2.4 Brown Paper construction steps

The typical steps taken when building a BP and utilising it to analyse and present information are:

1. Identify the process of relevance. Also define the scope of study by means of defining the beginning and the end.
2. Recruit the process owners or experts to build the BP. The experts should be the creators of the BP, while the BPR team members usually only facilitate the building process.
3. By means of a workshop the experts map the process flow on a blank BP and include all relevant information (cycle times, systems, documents used, etc.).
4. This BP then has to be validated by other people from the organisation that are also involved with the processes. These people have to give their comments on process issues and opportunities, which are written on "post-it notes" and stuck onto the BP. As validation, all participants should write their names on the BP on the validator's sheet.
5. Once completed, the BPR team has to study all comments made regarding the overall process. Findings and conclusions have to be made on the strengths and opportunities of the processes.
6. Finally, these findings and opportunities have to be presented back to management.

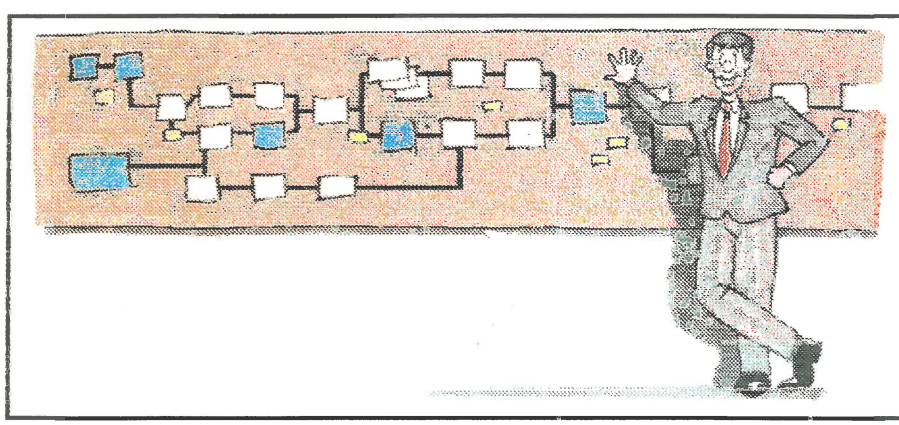


Figure 4-3 Brown Paper Process Flow

BP's are an effective tool to quickly gain information on how processes work and to find out what the opportunities are within the process. Going through the exercise of constructing and validating BP's is a method of getting buy-in from the organisation for BPR.

4.3.2.3 Plan – Do – Review (PDR) during BPR

The PDR cycle is a simple method that can be used when executing a meeting, a workshop, building Brown Papers, and even managing the phases of the BPR project. Following the PDR cycle for planning and executing meetings or workshops, involves the following steps:

- **Plan:**
  - Establish the need for the meeting / workshop.
  - Set a clear agenda.
  - Make all arrangements for the meeting (location, media, ect.)
  - Define roles and responsibilities for the meeting (chairman, facilitator).
  - Pre-position key contributors as input to the meeting.
  - Identify barriers that need to be overcome.
- **Do:**
  - Follow the agenda.
  - Record group thinking, issues and ideas on flipcharts to include in minutes.
  - Practice good meeting behaviour and facilitate the meeting properly.
  - Encourage participation of all participants.
  - Record Benefits and Concerns of the meeting.
  - List all Next Steps that need to be taken care of in the future.
- **Review:**
  - Evaluate the effectiveness of the meeting.
  - Circulate meeting summary and issues that were recorded.
  - Follow up on Next Steps.
  - Incorporate Benefits and Concerns into the next meeting plan.

BPR itself might seem like a constant exercise of building models, but in this repetition of BP building there is also a PDR logic to facilitate the process:

PLAN - Set an objective for building a BP model, which might be:

- to gain understanding of the process under investigation, or
- to identify opportunities within the process, or

- to validate a new process design (To-Be / Aspirational models).

DO - Build the BP model by means of a Workshop

- A workshop has to be used to get the 'experts' to build the model

REVIEW - Have the BP model reviewed by the organisation with the following objectives:

- the organisation has to validate the accuracy of the model;
- get comments on the model to gain additional information from the organisation and get buy-in;
- finally the BPR team has to review if the objective of the BP model, or BPR phase has been met, and if the next phase can continue.

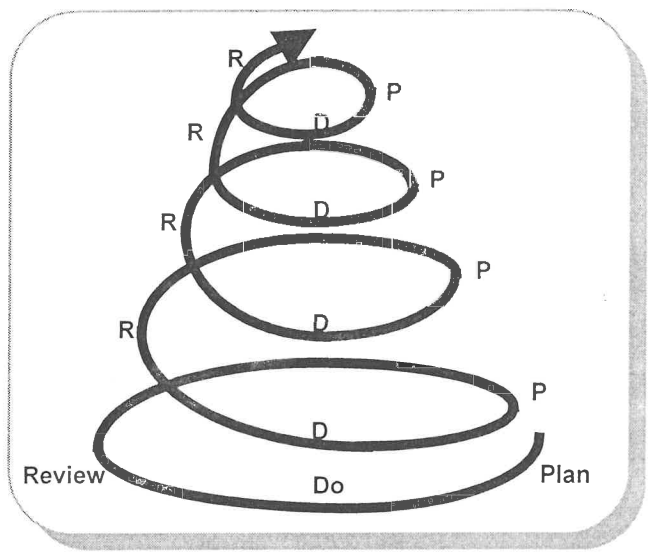


Figure 4-4 Continuous loops of Plan - Do - Review.

Plan – Do – Review is an iterative cycle of constantly managing the activities performed during BPR and making sure objectives are achieved.

4.3.2.4 RACI charting

In the process of analysing organisations in need for re-engineering, clearly defined roles and responsibilities are nearly always a shortcoming. This can usually be deducted by statements like: "It seems every department has someone putting together a spreadsheet on the same data", or "Things are always falling through the cracks". Typical results of clearly defined roles and responsibilities are:

- Increased productivity through well defined accountability
- Increased capacity by eliminating overlaps and redundancies
- Streamlined work processes by eliminating unneeded interfaces and placement of accountability where it belongs
- Improved organisation effectiveness results by allowing disciplines to co-operate and share responsibility

The benefits from such results can have significant improvement effects on an organisation without any expenditures in additional resources or systems. It can require a notable change in the organisation though, thus a technique is required to properly analyse and identify roles and responsibilities correctly.

RACI charting [16. Gemini] is a systematic and participative technique to:

- Identify all functions (activities, tasks, and decisions) that have to be accomplished for effective operation.
- Clarify roles and individual levels of participation in relation to each of these functions.
- Develop best methods for individuals to fill these roles.

RACI is an acronym for:

- **Responsible** - This is the individual(s) who perform an activity or is responsible for action / implementation. For a single function the Responsibility can be shared, thus there can be more than one R per function / activity.
- **Accountable** - The individual who is ultimately accountable, which includes yes/no and power of veto. Only one "A" can be assigned to an activity / decision.
- **Consulted** - The individual(s) to be consulted prior to a final decision or action is taken. It is an indication of two-way communication required.
- **Informed** - The individual(s) who needs to be informed after a decision or action is taken. Only one-way communication to these individuals are necessary.

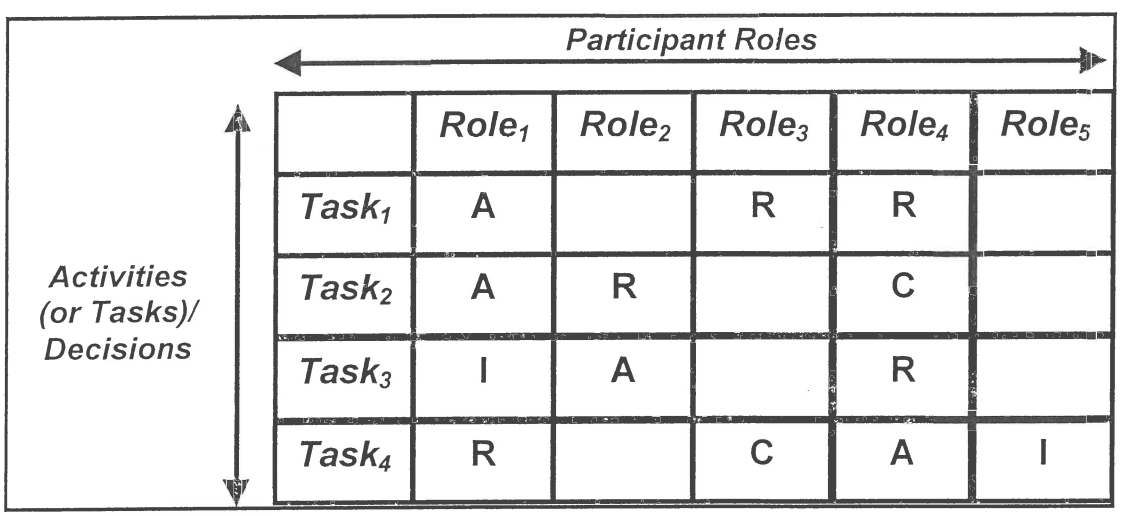
Developing RACI charts is a simple process, which basically consist of a four steps:

1. Determine the activities / decisions. This is usually taken directly from process flows that have been developed via Brown Paper exercises.

2. Prepare a list of participant roles. All possible departments that can be involved in a process have to be listed.

3. Develop the RACI chart. The format of a RACI chart is illustrated below. The activities are listed on the side and all the roles listed on top. For each activity all the possible roles are defined as R's, A's, C's, or I's.

4. Get feedback and buy-in. To ensure the highest possibility of defining accurate and correct RACI charts, it must be developed in workshops with all the relevant parties. This will also maximise the buy-in for accepting the RACI chart as correct.



	$Role_1$	$Role_2$	$Role_3$	$Role_4$	$Role_5$
$Task_1$	A		R	R	
$Task_2$	A	R		C	
$Task_3$	I	A		R	
$Task_4$	R		C	A	I

Figure 4-5 RACI chart

The last step of defining RACI charts are most probably the most important and difficult step. Defining RACI's is also not an action that should be seen as being done separately to all the other BPR activities, but as a part of the whole exercise to complete the picture of the optimum organisation.

4.3.2.5 KPI Measuring

Measurement are important to help manage a business. If a business or project don't measure against a plan, there is no way of knowing if things are good or bad compared to what needs to be achieved. Without measurements, improvement cannot be quantified. By measuring Key Performance Indicators (KPI's) it is possible to know where a business or project is going and how well it is doing.

A KPI is a clear, understandable reference of the wellness of an operation. It is measurable and point to controllable leverages for changing an operation. [16. Gemini] The diagram below illustrates how a KPI can be used to measure and improve a process by focussing on performance gaps.

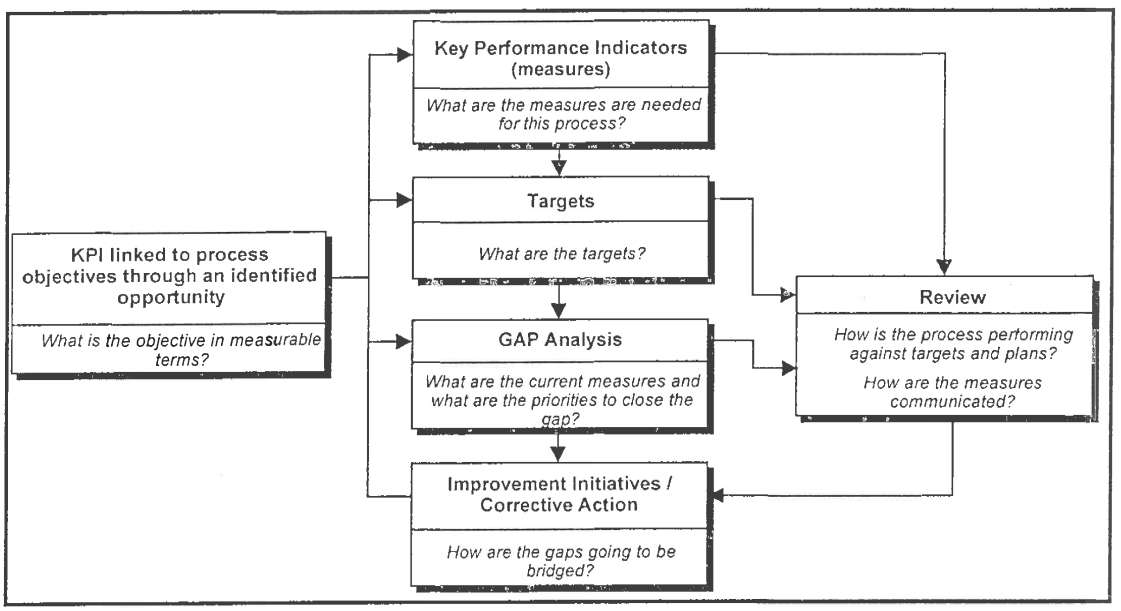


Figure 4-6 Process Improvement driven by KPI's.

Characteristics of good KPI's are:

- It focuses on the "critical few" in stead of the "trivial many".
- It facilitates pro-active and corrective action.
- It is bought into by those accountable for achieving the target objective.
- It motivates the process owners and helps to achieve continuos improvement.

The effect of successful BPR can only really be seen if reasonable KPI's has been put into place and are measured to indicate the improvement of the business. As a rule of thumb there should not be more than 5 KPI's per process, otherwise it becomes a troublesome exercise to measure it regularly. During the final BPR implementation it is KPI's targets that drives the embedding and sustainability of the improved processes.

4.4 The Sietel BPR process

4.4.1 Analysis and Design Phase

The objective of the analysis and design phase was to build a business case for a BPR exercise. This business case has to contain clearly defined opportunities in the organisation, with quantified cost or asset reductions, and revenue enhancement scenarios linked to the opportunities. These opportunities are identified by means of hypothesis testing. Hypothesis are made about insufficiencies in the organisation such as for ex: Invoicing of customers take a substantial amount of time which causes delayed payment. This hypothesis then has to be proven true or false. This is done in two ways:

Firstly, extensive interviews are held with relevant people in the organisation to gain information around the issues, such as for ex: what is the average lead-time to invoice the customer. If needed 'day in the life of' (DILO) studies can also be done to gain information of processes.

Secondly, generic Brown Papers (BP) are build of the processes within the organisation. Weaknesses and strengths are identified on these BP processes. The organisation is then invited to validate these BP and make their comments on the BP. Comments are written on 'stick-on' papers and stuck onto the BP. From these comments, or 'builds', conclusions and findings can be derived of the opportunities within the organisation.

Once a hypothesis has been proven true, a value of the opportunity has to be calculated in terms of an asset reduction, a cost reduction, or revenue enhancement. In the example of reducing invoicing cycle time, the interest cost for total late payments must be compared to the reduction of interest lost if payments were received earlier.

Collections of proven hypothesis on opportunities are thus transformed into benefits cases and form a business case. The business case is laid before management for decision whether BPR should be taken on or not. If BPR is to proceed the business case will be the guideline to which processes should be re-engineered and what benefits must be gained.

4.4.2 Analysis of current business processes

4.4.2.1 As-Is analysis

The As-Is analysis is a process of gathering as much detail information of the current business processes in as shortest time as possible. The generic process maps delivered by the A & D phase are used as a starting point. These processes with its comments and identified opportunities are studied to gain understanding of how these particular processes work in general. It does not give any information though of what is really going wrong, only the comments provide glimpses of insufficiencies. To learn the root causes of the insufficiencies in the processes detail process maps have to be build that will demonstrate the variations in the organisation from the generic processes. This is done by means of workshops where process experts are called in to build detail process maps. The generic process maps are hung-up in the workshop for reference, but the experts have to map the processes on blank sheets of brown paper using stick-on papers to record the individual activity blocks. The stick-on papers provide the benefit of moving the blocks around and nobody has to worry about it being placed wrong the first time around.

Once the business processes have been mapped in detail, the BP's have to be cleaned-up. This is basically rebuilding the BP's as neatly and understandably as possible in order that the organisation can validate it.

A special BP fair must then be organised where the whole organisation are invited to see the BP's and validate the truth and accuracy of the processes. The BPR team also has to prepare themselves to present these processes and answer any questions on the processes. Such an As-Is BP fair have the following benefits:

- The processes get validated by many process participants / owners, which ensure the BPR team that the information is true and accurate. Validators sign their names on the BP.
- The organisation is once again invited to give comments and build on the BP process which supply the BPR team with additional information.
- As people put their own comments on the BP, they get ownership of that BP, which makes them part of the BPR exercise. This is in itself a process of getting buy-in from the organisation for the product of the BPR process.
- Because the BPR team has to present the BP to the organisation and be able to answer questions and interact with the organisation, they are continuously getting to know the functioning of the processes better.

- Very few people in an organisation ever know and understand the total functioning of the organisation. A BP fair provides the opportunity for all employees to learn how the organisation works and how its processes operate.

After the BP fair all the comments have to be noted down, categorised to the different process areas and consolidated into findings. From this analysis exercise the BPR team should get a clear understanding of how the processes function and what is exactly wrong with it. At this stage there may still be no, or very few answers to solutions for the problems, but that is not important for As-Is analysis. It will most probably be that additional opportunities have been identified that was overlooked during the A&D phase. All these findings have to be summarised and reported back to the Executive Steering Group in order to ensure a proper understanding of the situation within the organisation. Only after a clear understanding of the processes, with its inadequacies and inefficiencies has been formed, can the BPR team continue to the To-Be design phase.

4.4.2.2 Should-Be Design Phase

The objective of mapping 'Should-Be' process flows is to identify the way business should work, the theoretical process, or the way it is intended to work. Identifying the areas where the 'As-Is' processes go astray from the 'Should-Be', represent the gaps for improvement. This is very useful when Business Process Optimisation is the goal. When attempting Business Process Re-engineering the aim is to break out of even the 'Should-Be' paradigms and looking with a total new perspective at the business processes.

To quote Michael Hammer in what he call the essence of Re-engineering: "At the heart of reengineering is the notion of discontinuous thinking-of recognising and breaking away from outdated rules and fundamental assumptions that underlie operations. Unless we chance these rules, we are merely rearranging the deck chairs on the Titanic. We cannot achieve breakthroughs in performance by cutting fat or automating existing processes" [21. Hammer].

Within Sietel the resulting 'Should-Be' processes were totally unplanned. Workshops were held with the objective to deliver 'To-Be' processes. Due to an inability to break out of the organisational mind frame, only optimised processes were produced, and not redesigned processes.

To facilitate the organisation in breaking out of their paradigms, a radical new vision had to be designed, which resulted in 'Aspirational' Models.

4.4.3 Designing the New Business Processes

4.4.3.1 Aspirational Models and Migration Strategy

As already mentioned, the objective of 'Aspirational' models is to create a drastic new vision of how the organisation's business can operate. Ideally this vision should indicate how technology is utilised, what the ultimate target lead-times should be, and a new way in which business will operate in the future.

The 'Aspirational' models were designed to be simplistic demonstrations of drastically improved processes. It is usually based on improved forecasting, taking as much operations out of the critical path as possible, and outsourcing non-core business activities. These models can also be referred to as the 'Could-Be' processes and show an option for how the business could operate in 2 to 3 years time.

Along with the Aspirational models, a stepped migration strategy also have to be designed. The migration strategy must indicate how the business will need to change over a 2 to 3 year period in order to reach the aspirational vision of operation. Such a migration strategy indicates various steps, or phases the business will need to go through.

Examples of such phases to reach the aspirational Supply Chain vision could be:

- First improve forecasting to 95% accuracy.
- Then start producing, and later on ordering against the forecast.
- Alter the product design to allow for pre-assembly to order.
- Finally outsource non-core business activities such as installation.

From the Sietel experience it was realised that small teams should design the 'Aspirational' models instead of using workshops. Project Team members that did analysis of the processes (As-Is and Should-Be) designed the Aspirational Models and Migration strategies. The logic were not to use people directly involved in the processes, but rather knowledgeable experts that had a different perspective. Benchmarks and Best Practices information provided by the consultants were very important in these models. It formed the basis of the assumptions made in the Aspirational Models.

4.4.3.2 To-Be Design Phase by Cross Functional Teams

Before moving on to 'To-Be' designs, Sietel had gone through two phases of analysis, which consisted of:

- The A&D phase in which the opportunities for re-engineering in Sietel was defined and the project design for BPR was done.
- The Design phase in which Sietel's processes were analysed, a vision was determined for the company, and the exact scope for process design was set.

At this stage of the project it was exactly known how the various processes in the organisation interacted, and which of these business areas required 'To-Be' processes designed. Sietel's Value Chain were further sub-divided for this purpose and 'To-Be' models had to be designed for the following Value Chain aspects:

- Customer Relations - this related to all contacts with customers and setting up Service Level Agreements (SLA's) for the service that will be delivered.
- Offer Preparation and Order Processing - the process involved in tendering and subsequent handling of the customer's orders.
- Supplier Optimisation - focus on reducing the amount of suppliers and setting SLA's in place with the preferred suppliers.
- Procurement Processes - involved placing orders with suppliers and expediting goods or services.
- Inbound and Outbound logistics - involved any transportation of goods from the suppliers up to the point where the customer receives it.
- Warehousing - all the storage areas and the processes to receive goods, store it and dispatch it.
- Installation and Commissioning - these were all processes involved in preparing and performing installation of systems, and setting the systems up for operation.
- Service Business Development - these activities focussed on new business that can be generated from providing additional services to already existing customers.
- Service processes - these are all the after sales services such as help desk, maintenance and repairs.
- Invoicing and Collection - focussed on invoicing customers for goods delivered and services rendered, and making sure that money is collected on time.

In order to design 'To-Be' models for each of these processes a Cross Functional Team had to be allocated for each. Managers from the Key Accounts in Sietel were required to allocate various experts to each of these Cross Functional Teams. Each of these cross-functional teams was also taken through an onboarding process and the expectations explained to them. The Sietel members from the BPR project team each had to lead two cross-functional teams and the consultants had to facilitate these teams. The process these teams went through to redesign the Supply Chain segments were:

1. Define an aspiration for the supply chain segment. This step required the team to identify the inputs and outputs to that particular process. They also had to define what "good" would look like for that process in terms of aspirational operation.

2. Identify the strategy for the Supply Chain segment. With strategy, it meant the best practices applicable for that particular process had to be identified. Examples were: Optimise suppliers with ABC classification, establish a centralised procurement department, ect.

3. Design and map a new process. In workshop format brown paper processes had to be designed for each of these processes with all possible interfaces. It then was captured electronically for later integration into other process.

4. Define the RACI's for each of the process activities. All the involved parties had to be identified and their responsibilities were identified with RACI charts. These RACI's were later on also integrated with each other for the total supply chain view.

5. The detail tasks performed in each process activity had to be defined. This was the step by step actions that were performed in each activity. These detail tasks also had to correlate with the RACI charts in terms of who perform these tasks. From this, later estimations can be made of the staff requirements to perform these processes.

6. Identify KPI's for the Supply Chain segments. It was suggested that an average of 5 KPI's had to be identified to measure each process. To measure more KPI's would be illogical. KPI's usually consisted of either measuring lead times, costs / savings, or volumes such as stock.

7. Identify the organisational structure that needs to own and operate the process. From the RACI's and detail tasks staff estimates could be made that was required to handle the new processes and micro organisational structures had to be designed for these.

The result from these cross-functional teams were detail designs which were documented and referred to as the "process steps 1-7" for each supply chain segment. With the accomplishment of this objective, the operation of the cross-functional teams was stopped. The 10 Supply chain segmented processes were then linked with each other into one integrated supply chain process by the BPR project team. The purpose of this integration was to ensure that a proper flow exists for the 'To-Be' Sietel supply chain, from Offer Preparation until final Invoicing and Collection.

4.4.4 Implementation and Embedding of the designed processes

The biggest challenge of the project was to implement the newly designed processes, but this required the following three preliminary activities:

1. Proper project planning had to be done for implementation. This required a realistic timeline with milestones, resources that had to be made available, extraordinary costs for implementation had to be estimated, and interdependencies between various processes and systems had to be established. This implementation planning were done by the BPR project team members in conjunction with the future process owners (the managers in whose units the processes will exist), with even some involvement from the coaches.

2. An implementation team whom had to ensure the designed processes became implemented and embedded, had to be selected and made available. Ideally the team had to consist of the future process owners, some of the experts from the cross-functional teams, and once again some of the BPR project team members to facilitate the implementation project.

3. Any Critical Success Factors for implementation have to be addressed by the coaches. An example of a critical success factor is the initiation of changes in the organisational structure to adapt for the new processes.

During this part of the project, the BPR project team has to act as project co-ordinators and rely on project management and monitoring principles to drive implementation. The deliverables were much clearer at this stage than at the beginning of the project, and the following list of criteria were the indication of successful implementation for each process:

- Process documentation has to be in place and updated according to the latest relevant changes.
- Orientation and training of the key users of the new processes has to be complete.
- The process owners have to accept ownership of the new processes, and accountability and responsibility have to be transferred to the relevant functional areas (old process owners had to relinquish ownership).
- Long term enablers to support the processes, such as information systems, have to be implemented.
- Measurements (KPI's) for the new processes have to be in place and tracking the operation of the supply chain.
- The people (process users) have to understand the basic processes.

Once these criteria were met and the Executive Steering Group were satisfied with the results, a final "accomplishment permit" was awarded, which meant the BPR objectives were achieved and the BPR project team could be disassembled.

4.5 BPR Methodologies conclusion

For Sietel the end of the BPR project did not mean the process of change stopped. The biggest intangible benefit that resulted from this BPR project was the culture change. This episode could be considered as a quantum leap for Sietel into a world class situation from which continuos improvement could effectively proceed.

From the various BPR techniques and methodologies studied and discussed, with specific reference to the approach followed in the Sietel Case study, a remarkable similarity can be concluded for BPR approaches. This can be summarised as:

1. Identification of the re-engineering opportunity (as performed in the A&D phase for Sietel)
2. Analysis of the current business processes.
3. Designing of the new business processes.
4. Implementation and embedding of the designed processes.

5 Best Practices and Benchmarks

5.1 Best Practices and Benchmarks Introduction

The road to becoming a world-class company requires an organisation to compare all its fields constantly with the best companies in the industry. The technical term for this process is "benchmarking", which basically means measuring oneself against others and learning from them. Only then does an organisation really know where it stand relative to its competitors; and only then can it take concrete measures to change things. [46. Siemens top+] Essentially, there are two types of benchmarking: comparison with the industry leader (competitor benchmarking); and comparison with the process leader ("best of best" benchmarking). The process leader is the company, which irrespective of its line of industry, has the best mastery of its process anywhere in the world. A possible third type of benchmarking can be included, and that is benchmarking against oneself. If an organisation is already a process leader, or is in such a niche business that there is no one to compare to, it can measure its progress against itself to see if it is constantly improving on its own standards.

International Best Practice (IBP) has its origins in the decline of American manufacturing, which became apparent in the 1980s. In an attempt to explain this decline, researchers developed the idea of best practice as a means to identify the reasons for successful manufacturing on the part of America's competitors (Japanese in this case). As a result of this type of research, 6 components in best practice were defined [7. Lloyd]:

1. Focus on simultaneous improvement in cost, quality and delivery.
2. Establish closer links to customers.
3. Establish closer relationships with suppliers.
4. Use technology effectively as a strategic advantage.
5. Create flatter organisation structures for greater flexibility, commonly involving only four or five levels from shopfloor level to management director.
6. Set human resource policies, which promote continuos learning, teamwork, participation and flexibility.

5.2 Chapter Objective

Best Practices and Benchmarking are useful tools during BPR. Unfortunately it is often misunderstood in practice and not used. Process owners commonly have the reasoning: "our business is so different that the text book stuff does not apply to it", which cause stubbornness about best practices or intentions to measure against anybody else. This chapter will look at how benchmarking and best practices originated and some examples of best practices. It is not the aim of this dissertation

to name and discuss all best practices (that would be a dissertation on its own, and would most probably be outdated by the time it is being examined). The main objective of this chapter though, is to explain how benchmarks can be used during the As-Is analysis of an organisation, and the how best practices are designed into To-Be processes.

5.3 Best Practices descriptions

In a way, each one of the chapters in this dissertation examines a best practice: identifying EVA opportunities, BPR in itself, the Balanced Scorecard approach, utilisation of Project Management, and creating Business Architectures. In business, there are often 'ways of doing things better', which can be applied to other industries. In the following paragraphs generic 'ways of doing things better' are explained as best practices. In his re-engineering article Hammer referred to these 'ways of doing things better' as: 'Principles of Re-engineering' [21. Hammer] and in his book: Reengineering the corporation , Hammer explained best practices as methods to rethink business processes, enabling IT, and creating a new world of work. [4. Hammer]

5.3.1 Customer Relations

To establish close links to one's customers can be one of the most beneficial aspects for an organisation from a revenue point of view. Kaplan suggested the following best practice goals: get standard products to markets sooner, improve customers' time to market, become customer's supplier of choice through partnerships with them, and develop innovative products tailored to customer needs. [24. Kaplan et al]

To get close and satisfy one's customer, customer strategies must be followed.

Ken Lewis from Dutton Engineering, a small UK company that won the prestigious Wedgwood Trophy (1994), and the KPMG Anglia Award for Motivation (1997) describes their attempts of strong customer focus as: "Be proactive to understand the customer, often customers don't know where they are going themselves, but if spend enough time, it is possible to get to know the customers ambitions".[6. Lewis]

Hammer suggested: *case managers to provide single point of contact* as customer interface strategy. A case manager is an interface for the customer to the dispersed and complex processes that produce his products or services. When reporting have to be done on the progress of a product or service, the customer only deals with the case manager, not the red tape of searching for answers himself. Another customer strategy by Hammer is to *have multiple versions for processes*. For example, each customer request should not take the same tedious procedure, but have a fast track route for simple requests, standard route for medium to hard requests, and specialist attention for exceptions. [4. Hammer]

5.3.1.1 Customer Value

Brecker Associates, a Pittsburgh based consulting firm that focus on maximum value performance, state that '**Customer Value** is why customer purchase an organisation's products and services. They want the most value for the price and they define value in their terms. Enhancing that value enables organisation's to increase their customer satisfaction and competitiveness in the marketplace.' [39. Brecker] This emphasises the importance in listen to, and understanding customers continuously to keep up with changing customer needs and desires, and being flexible in responding to their needs.

Employing principles such as Quality Function Deployment (discussed under Research and Development) ensures that the focus of product and service development, production and implementation, focus on customer value, which is the basis for the existence of the organisation. A structured approach to define best practice levers to enhance customer value is:

- Identify and quantify customer needs,
- Evaluate product and service features against these customer needs, and
- Identify critical process characteristics and measurements required to reduce the variation in meeting these needs.

5.3.1.2 Service Level Agreement

One of the keys to better customer service is the introduction of **Service Level Agreements** (SLA's). Gemini's Service Level Management explained SLA's as: 'The most important step in the provision of a credible service is the definition of a realistic Service Level Agreement (SLA). [18. Gemini] A Service Level Agreement describes what is to be measured, how it is to be measured, the target service levels to be achieved, and any qualifying conditions, which must be met in order for it to be achieved.' At its basic level, a SLA is an exchange of expectations between the customer and supplier and provides an agreed framework for doing business. SLA's open the door to co-operation, create trust and reduce conflict by solving problems as (or before) they occur.

5.3.2 Logistics Management

The field of logistics management generally includes Procurement, Transportation and Warehousing functions. Globally it can be seen as the whole process of ensuring that the right materials, is on the right place, at the right time, in the right quantities. A key enabler to achieving world class logistics management is supplier and agent management. As Kaplan explained the benefits: "An excellent supplier may charge higher unit price for products than other vendors but nonetheless be a lower cost supplier because it can deliver defect free products in exactly the right quantities at exactly the right time directly to the production process and can minimise, through electronic data interchange, the administrative hassles of ordering, invoicing, and paying for materials." [24. Kaplan]

5.3.2.1 Supplier Management

Brecker Associates suggests that analysing materials and services purchases can yield quick savings even in well-run organisations. Purchases can be examined by

- Commodity,
- Supplier,
- monetary value,
- frequency of transactions, and
- make or buy decisions

to determine how value can be enhanced while saving time, effort, and money. [39. Brecker] Often it can be found that the same commodities are bought from various suppliers, at various prices. Improvement actions taken depends on the strategic nature of the materials or services being purchased and the impact on the business in terms of cycle time and monetary savings.

Performing an ABC classification (according to business volume) on suppliers can quickly determine which suppliers are important. **Partnership sourcing** analysis and actions can then be undertaken. Ken Lewis identified partnership sourcing as: 'a commitment by both customers and suppliers, regardless of size, to a long-term relationship based on clear, mutually agreed objectives to strive for world-class capabilities and competitiveness' with the objectives of [6. Lewis]:

- Minimising total costs.
- Maximising product and service development.
- Obtaining a competitive advantage.

The benefits and advantages to be gained from partnership sourcing are:

- Security of supply – Identifying and developing good suppliers and give them the business of the bad ones. These good suppliers will start treating the organisation as a valued customer.
- Reduced paperwork – Instead of various purchase orders and invoices, only single purchase orders have to be made and single invoices are received, reducing administrative costs.
- Improved Quality and cost savings – Good quality is a prerequisite to become a preferred supplier. With this in place, in-coming quality inspections can be eliminated.
- Simpler delivery systems – Utilising Just-In-Time (JIT), direct-to-line and Kanban methods, suppliers can deliver raw materials directly to production lines in the correct quantities.
- Lower stocks and better asset management – On time deliveries from good suppliers ensure that optimum stock levels can be maintained and 'just-in-case' stocks (which can in anyway not be found when needed) can be eliminated.
- Forward planning – Suppliers can do better forecasting based on open communication, and improve their ability to meet delivery targets and deadlines.
- Financial stability – A mutual trust must be created in which suppliers will deliver on time, and then get paid on time. Supplier's stable cash flow is of importance for both the supplier and the customer.
- Reduced total cost – Open communication ensures proactive steps to remedy problem situations, which in retrospect could always have high cost impacts.

5.3.2.2 Materials Transportation

Transportation Best Practices does not feature much in text books or academic articles, yet this activity presents itself with various opportunities / threats. It is an important activity in any supply chain, involving valuable time and presenting risks. The Siemens top+ award program identified the following best practices for international transportation [46. Siemens top+]:

- Project / Batch consolidation – Utilising optimum quantities for transportation, and ensure all project components are shipped at once reduce double shipments.
- Close partnership with Transportation Agents – Same as with supplier partnership sourcing, good agents reduced risks involved with transportation. Some agents can even provide customers access to electronic tracking systems, thus an ability to exactly pinpoint cargo location.
- Pre-clearances at customs – Custom delays are often found to be the longest 'hold-ups' when transporting across borders. If correct material and shipment documentation is presented to customs before cargo arrives at a border, pre-clearance can be done and any delays eliminated.

- Air freight versus Sea freight – With the transportation of expensive telecommunication equipment, the interest cost on 4 weeks of sea freight justifies air freight.

5.3.2.3 *Centralisation / Decentralisation of Logistics functions*

To centralise or to decentralise? The following Dilbert illustration by Scott Adams is most probably the best answer.

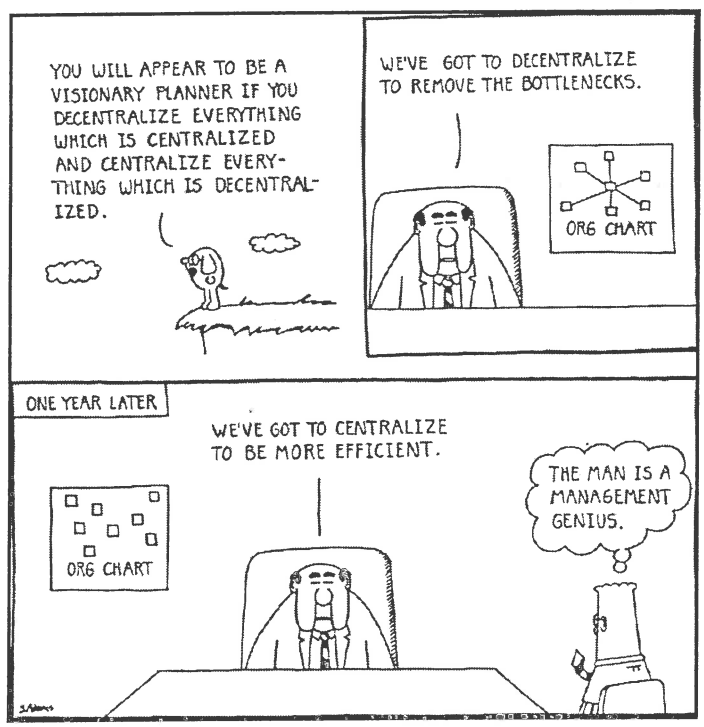


Figure 5-1 To centralise or not to centralise [Adams]

The drive to Centralise functions is very dependent on organisation characteristics such as topography, size, bureaucracy, and supporting communication and information systems. Centralisation or decentralisation of logistics activities is usually based on establishing control versus creating flexibility. Hammer's views on this topic were [4. Hammer et al]:

- *Work should be performed where it makes the most sense* – don't use a specialist for a job just because it is a specialist, where possible, *have those who use the output of the process, perform the process*. The advent of expert systems and databases can provide process owners sufficient specialist knowledge to perform those tasks themselves.

- *Establish hybrid centralised/decentralised operations* – IT, communication systems and shared databases provide the facility to pool knowledge and make it accessible in far regions. *Geographic dispersed resources can be treated as though they were centralised.*

In the Sietel business it was realised that logistics activities are of importance because the majority of the telecommunication products and components are sourced from various suppliers abroad. The Sales Account Managers traditionally tried to manage these activities themselves. To optimise quality

of delivery and cost effectiveness, this function was centralised in a Logistics Department with decentralised logistic project managers in the Sales departments. This resulted in close control, on time delivery and a decrease in stockholding and eliminated duplication. The centralised facility made the implementation of logistics best practices much more effective. But this facility first had to prove their capability to handle logistics activities. In addition a real-time Enterprise Requirement Planning (ERP) system have to be in place to ensure immediate responses and transparency of information (for example: stock availability / order progress). The centralised Logistics department had to provide SLA's to the Sales departments promising a certain amount of flexibility (such as expedite possibilities). [33. Tirisano]

5.3.3 World Class Manufacturing

Ken Lewis made the following comments of becoming a world class manufacturing company [6. Lewis]:

- World-class manufacturing means top management commit to manufacturing as a competitive weapon. The whole company is committed to use its resources to beat the competition.
- World-class manufacturing is not a scattergun attempt to be best at everything. You have to know what you are good at, and sub-contract the rest to good quality suppliers
- Awareness of best practice techniques. Make time to see best practice techniques in operation.

5.3.3.1 Just-In-Time (JIT) Manufacturing

Just-In-Time manufacturing is an integrated set of activities designed to achieve high-volume manufacturing using minimal inventories of parts that arrive at the workshop just in time. Producing customised products one-at-a-time for each customer order and delivering it virtually the same day has been popularised as the ideal, agile manufacturing enterprise. Common sense economics requires that the degree of product customisation versus production volume be considered and balanced with processing capabilities for each product.

A wide variety of techniques can be utilised to determine appropriate JIT practices to implement. JIT requires a "systems" look at the product variety being manufactured and assembled, process capabilities, purchased materials, and competitive advantage. Each situation has its unique facets based on volume, mix, and technologies. Objectives are to reduce the amount of shop floor co-ordination required while increasing the flexibility to handle individual orders. Techniques applied to accomplish JIT manufacturing include [1.Aquilano et al]:

1. Design Process Flows
2. Total Quality Control
3. Stabilise schedules

4. Kanban Pull

5. Work with Vendors

6. Reduce Inventory even more

7. Improve Product design

5.3.3.2 MRP and MRP II

MRP (I & II) is a logical, easily understandable approach to the problem of determining the number of parts, components, materials and resources needed to produce an end item / service.

Based on a master schedule derived from a production plan, a Material Requirements Planning (MRP) system creates schedules identifying the specific parts and materials required to produce end items, the exact numbers needed, and the dates when orders for these materials should be released and be received or completed within the production cycle. [1. Aquilano et al]

Manufacturing Resource Planning (MRP II) is simply an improved version of MRP as discussed above. MRP II considers resources as well as materials.

5.3.3.3 Total Quality Management (TQM)

The term Total Quality Management has been coined to describe a philosophy that makes quality values the driving force behind leadership, design, planning and improvement initiatives. [1. Aquilano et al] In drives to implement TQM organisations perform Quality Control utilising certain tools, achieve ISO 9000 registration, put Continuos Improvement cycles in place, and some even apply for the Malcolm Baldridge National Quality Award.

5.3.3.3.1 Quality Control

Process Quality Planning for products / services starts with an understanding of the random defects that occur in the manufacturing of related products. A facilitated team, using a structured process, combines new product specifications with process specifications and predicts the defects at each step in the process flow. Action plans are developed to improve the processes or improve design robustness. Increasing the process First Time Yield (FTY) greatly improves financial performance.

Statistical Process Control (SPC) involves testing a random sample of output from a process to determine whether the process is producing items within a pre-selected range. Generic SPC tools that can be used for problem solving and process improvement are [1. Aquilano et al]:

- Process Flow Charts – A picture that describes the main steps, branches and eventual outputs of a process.

- Check Sheets – An organised method for recording data.

- Pareto Analysis and histograms – A co-ordinated approach for identifying, ranking and working to permanently eliminate defects. Focus on the important error sources (80/20 rule).

- Data collection – Have a clear reason and purpose for data collection, then use 5H2W method; ask: What? Why? Where? When? Who/ How? How much?

- Cause and effect (or Fishbone) diagrams – Uses a graphical description of the process elements to analyse potential sources of process variation.

- Run charts – A time sequence chart showing plotted values of a characteristic.

- Control charts – A time sequence chart showing plotted values of a statistic, including a central line and one or more statistical derived control limits.

5.3.3.3.2 ISO 9000

ISO 9000 is a series of standards agreed upon by the International Organisation for Standards (ISO) and adopted in 1987. More than 100 countries now recognise the 9000 series for quality standards and certification for trade. The 20 elements comprising ISO 9000 certification are [1. Aquilano et al]:

1. Management Responsibility
2. Quality system
3. Contract Review
4. Design Control
5. Document Control
6. Purchasing
7. Customer-supplier material
8. Product Identification and traceability
9. Process control
10. Inspection and testing
11. Inspection, measuring, and test equipment
12. Inspection and test status
13. Control of non-conforming product

14. Corrective action

15. Handling, storage packaging and delivery

16. Quality records

17. Internal quality audits

18. Training

19. Servicing

20. Statistical techniques

5.3.3.3.3 Continuos Improvement

Continual Improvement of machinery, materials, labour utilisation and production methods through application of suggestions and ideas of team members. This management philosophy makes use of quality circles/teams (see later under workforce empowerment) that continually assess processes for minor improvements in PDCA (plan-do-check-act) cycles.

5.3.3.3.4 The Malcolm Baldrige National Quality Award (MBNQA)

The MBNQA represents the United States government's endorsement of quality as an essential part of business strategy. "Using the Baldrige criteria helps American businesses improve their competitive advantage, productivity, customer satisfaction and employee involvement, yielding stronger financial performance and business results," said Harry Hertz, director of the office of quality programs at the National Institute of Standards and Technology (NIST), Gaithersburg, MD. [44. NIST]

To apply for this award, companies are measured against performance excellence. The criteria for the year 2000 are:

- Leadership—examines how senior executives guide the company and how the company addresses its responsibilities to the public and practices good citizenship.

- Strategic planning—examines how the company develop strategic directions and how it deploys key action plans.

- Customer and market focus—examines how the company determines requirements and expectations of customers and markets, and how it builds relationships with customers.

- Information and analysis—examines the management and effective use of data and information to measure and analyse company's performance.

- Human resource development and management—examines how the company's systems work, how it educate, train and develop its workforce and maintain employee well-being and satisfaction.

- Process management—examines how key product and service design and delivery processes are managed and supported, and how key suppliers / partnering are handled.

- Business results—examines the company's performance and improvement in its key business areas—customers focused results, financial and market performance, human resources, supplier and partner performance and organisational effectiveness—and how it performs relative to competitors.

5.3.4 Product and Service Development

Manufacturing and Services operations are found to be in a constant state of flux due to changes in sales, both product mix and volume, and changes in product or service design. To ensure overall competitiveness, it is essential to minimise cycle time both in product delivery and product development.

5.3.4.1 Concurrent Engineering

Concurrent Engineering is the earliest possible parallel integration of a company's knowledge, resources and expertise, regarding all factors that will influence the product over its life-cycle; so as to develop the product, and its manufacturing and support processes in parallel, with the shortest possible time-to-market and the highest product quality. [29. Minaar]

Minimising the cycle time to bring new products or services to market, enables an organisation to maximise its return from those new products and services. It is well established that developing products and services that

- respond timely to customer needs,

- minimising the changes required to fix problems after introduction, and

- maximising the fit to the organisations existing and planned process capabilities,

lead to higher profits. [39. Brecker]

Quality Function Deployment (QFD) and Value Analysis / Value Engineering (VA/VE) techniques are utilised in the facilitation of multi-functional product teams to

- develop customer needs and product requirements,

- design the product and the processes,

- and guide products and processes through development.

5.3.4.2 Quality Function Deployment (QFD)

QFD is a system for translating consumer requirements into appropriate company requirements at every stage, from research, through product design and development, to manufacture, distribution, installation and marketing, sales and services. QFD is a systematic process that ensures that the voice of the customer is being transferred into engineering processes through all stages of the product lifecycle. A structured QFD approach is utilised to plan and satisfy [39. Brecker]:

- customer needs
- product characteristics
- component characteristics
- process requirements
- operations requirements

5.3.4.3 Value Engineering / Value Analysis

Value engineering is a system that evaluates each step in design, materials, processes, and operations so as to manufacture a product that performs its intended functions and has the lowest possible cost. The value of a product is then defined as the ratio of product function and performance to the cost of the product. Thus the goal of value engineering is to obtain maximum performance per unit cost. [39. Brecker] A variety of structured Value Engineering or Value Analysis techniques, such as

- targeting
- economic analysis
- function diagramming
- brainstorming (blast, refine, create)
- cost analysis
- competitive comparison

are utilised to identify and quantify all product or service features, functions, and components. Emphasis is on utilising creativity to identify opportunities to increase the value of a product / service, while reducing costs of purchased materials and process labour.

5.3.4.4 Design for Manufacturing (DFM)

DFM brings design, manufacture, and service personnel together in the product design phase to ensure that new products fit the process capabilities of the organisation and are easy to service. Design standards are developed and applied to integrate with critical process requirements. Focus is also brought on future product and process equipment requirements.

5.3.4.5 Design for Assembly (DFA)

DFA focuses on increasing the quality of an assembled product while reducing the labour content. Whether a product is assembled by automated equipment or by hand, reducing the number of parts and simplifying the assembly steps leads to lower assembly cost as well as higher quality. DFM and DFA are frequently used concurrently in developing cost effective designs.

5.3.5 Workforce Empowerment

To have an empowered workforce is not a best practice or benefit that can be quantified in terms of cost, time or quality, but it is the most important critical success factor to achieve any type of BPR success.

Hammer & Champy explained the following changes related to re-engineering, with the following workforce empowerment best practices in particular [4. Hammer et al]:

- Work units change from functional departments to process teams – Instead of products / services progressing from one department to another, a single team of multiple experts owns the process to deliver the product / service to a customer.
- Several jobs are combined into one – Work is not segregated and workers get to see the results of their activities. They are not just cogs in the organisational wheel.
- Jobs change from simple tasks to multi-dimensional tasks – Working in cross-functional teams cause that team members get broader exposure and see more of a product / service's life cycle.
- Workers make decisions – With more of a holistic process view and understanding, workers are better enabled to make decisions. This cause not only a horizontal squash of the organisation (due to single teams accountable for processes), but also a vertical squash by eliminating the need for managers that have to make process decisions.
- People's roles change from controlled to empowered – By working in teams, having process ownership and decision authority cause teams to become empowered and reduce the need for checking and controlling.
- Job preparation requires an education instead of just training – Education ensures workers the ability to learn and think for themselves.

- Performance measures don't focus on activities, but on results – Compensation should not be based on job rank or seniority, but on outputs.
- Advancement should not be based on performance, but on ability – The best sales reps are usually not the best sales managers. Growth and development requirements must be identified and given to prospective managers.
- Values change from protective to productive – Once employees realise their importance in the organisation, they will stop protecting and hiding their jobs, but try to deliver and contribute.
- Managers stop being supervisors and start becoming coaches – The main task of a manager must be to co-ordinate and facilitate teams. It is possible to mentor more people, than manage people, thus requiring a flatter organisational structure.
- Organisational structures change from hierarchies to flat – Process teams, empowered decision making and mentoring enables flatter organisation structures.
- Executives changes from scorekeepers to leaders – Checking the financial outcomes should not be the main focus of executives, but ensuring right designed processes and organisations that permit workers to produce their highest possible outputs.

Most of these best practices are underlying in all change management philosophies, which always require some form of teamwork. In most cases, a team will result in one of the following three types:

1. Natural working / Process teams – these are multi-skilled permanent teams that have to manage a process or deliver specific products / services.
2. Cross-functional / Virtual teams – these are non permanent teams with members from various areas that has a specific deliverable, such as new products development.
3. Rapid action teams / Quality circles – these are teams with members all from the same area, or different areas, but with a common problem that can be solved in a short time.

Teamwork and the structure of teams are explained in more detail in a later chapter.

5.3.6 Information Technology strategies

The progress of IT and the possibilities it offers was one of the key enablers for BPR. But often it is found that heavy investments in IT have delivered disappointing results, largely because companies tend to use technology to mechanise old ways of doing business. [21. Hammer] The power of modern IT allow the radical redesign of business processes by challenging the following business rules:

- Shared databases allow the same information to be viewed in as many places as possible.
- Expert systems allow generalists to do the work of an expert.
- Telecommunication networks allow organisations to simultaneously reap the benefits of centralisation and decentralisation.
- Decision support tools (database access and modelling software) cause decision-making to be part of everyone's job.
- Wireless data communication and laptop computers provide field personnel the capability to send and receive information from wherever they are.
- Interactive multimedia software creates new opportunities for effective contact with potential buyers.
- Automatic identification and tracking technology (smart chips / satellite tracking) improves traceability of assets and resources.
- High performance computing power can make it possible for plans to be revised instantaneously (MRP-runs can be performed daily instead of monthly).
- Information can be captured once, at the source, and the information processing is done at the activity where it is required (bar-code readers facilitate picking and storing activities).

Being at the end of the second millennium (year 2000), IT has enhanced civilisation's progress with leaps and bounds, and that is especially evident in how effective it made the modern organisation. Due the size of computing power, fast information transfer over wide distances, and the ability to store and instantaneously retrieve vast amounts of data, IT created new ways of running operations. It has changed the business administration paradigm to one requiring the least amount of effort, with efficient and accurate results. Examples of best practices found in the form of IT applications are:

5.3.6.1 Enterprise Resource Planning (ERP) systems

Enterprise Resource Planning or ERP has been defined as: The set of integrated software and tools that a company needs in order to ensure effective operation of its supply chain [30. Moulding]. Spawned from the MRPII philosophy, ERP systems pro-actively utilise information to dynamically

balance the use of financial, manufacturing and distribution resources. The key features of ERP systems that provide benefits to organisations are:

1. Integration of Data and Software – It provides a single set of data for the organisation to work from and cause interaction of activities between various functions.
2. Operates along the total Supply Chain – It does not simply automate order processing or production control activities, but co-ordinates all activities in the organisation's supply chain.
3. Effective and agile enterprise operation – Utilising the strong computing power provided by modern technology, ERP systems enable real time operation and immediate response.

Examples of some of the best ERP systems on the market today [rated by SAPICS 98] are:

- SAP R3
- Oracle Applications
- The Compact Collection
- Impact Encore
- OPENPRO developed by QAD
- BAAN

5.3.6.2 Finite Capacity Scheduling systems

Finite Capacity Scheduling systems focus on predicting demand as accurately as possible and then plan capacity accordingly for manufacturing and elated logistics processes. These systems differ from ERP systems in that it focuses on the complex forecasting functions, which is achieved by means of:

- The use of advanced planning and scheduling capabilities to balance demand and supply. The goal being to get as close to the ideal of make-to-demand in virtually no lead time.
- Advance algorithms test various combinations of demand supply balances to assist planners in optimum resource scheduling.

The ideal should be to integrate a finite capacity scheduling and ERP system, given adequate organisational need and resources. Examples of the best finite capacity scheduling systems on the market are [32. SAPICS]:

- Manugistics
- OPT-21 and ST-Point both supplied by the Scheduling Technology Group (STG)

- Concorde XAL
- Rhythm developed by i2 Technologies

5.3.6.3 Workflow systems

Workflow can be described as the flow of information and control in a business process. Consequently Workflow management is the efficient management of this flow of information and control in a company's business processes [42. GFI] The IT required to support workflow consist of the following four elements:

1. Workflow, or process definition tools
2. Workflow servers or engines
3. Workflow client applications
4. Workflow monitoring / administration tools

The benefits from utilising workflow technology are streamlined, speedier processes, with improved tracking and control of business operations.

5.3.6.4 Business Intelligence systems

Business Intelligence (BI) systems provide the ability to report critical corporate data efficiently and in real time. It goes beyond structured query language (SQL) type queries that only delivers transaction-level details from data warehouses. By means of online analytical processing (OLAP) interactive reports that are highly formatted, easily deployed and effortless to use, it provides selective chunks of information to decision makers. OLAP reports can be regular status reports, but are especially effective for KPI reporting, business performance measurement reporting and scorecard keeping. [40. Cognos]

5.3.6.5 Electronic Commerce

The formal definition for Electronic Commerce (e-commerce) is 'the commercial exchange of goods, services, information, or ideas between two or more parties enabled by a digital medium'. [15. Gemini C④ Lab] This term are beginning to not only include business transactions, but also processes leading up to, and following the actual sale. The main enablers for e-commerce are the Internet and intranet-based private networks, in conjunction with electronic data interchange (EDI), call centres, interactive television and other multimedia channels. During the last decade, most of the 'cyberspace-smart' businesses could increase their sales through penetration of new markets made reachable via the Internet.

5.3.6.6 Knowledge Management

Knowledge Management (KM) involves all those deliberate efforts to maximise an organisation's performance through creating, sharing and leveraging knowledge and experience from internal and external resources. It provides a knowledge enrichment in organisations that promotes better business understanding for existing employees, ensuring knowledge redundancy from employees leaving the organisation, and a shorter introduction period for new employees. The 'BPR toolbox' CD accompanied by this dissertation is an example of KM of BPR training material.

5.4 Using Best Practices and Benchmarks during re-engineering

The purpose of benchmarking is to compare an organisation's current situation to another's, then determine how good, or bad, it measure against this reference and where it wants to be in comparison. Thus benchmarks are most effectively used during As-Is analysis and Aspirational design phases. To get detail benchmarking information with direct implication on one's own operations would require information from somebody with the same processes as oneself, such as competitors, which is usually hard to come by. Alternatively, generic benchmarking characteristics can be used.

As a generic benchmarking exercise, Gemini Consulting would use the following graph and ask clients to rate themselves on such a scale. [16. Gemini] For aspirational business models, they were then asked which types of initiatives would they want to pursue.

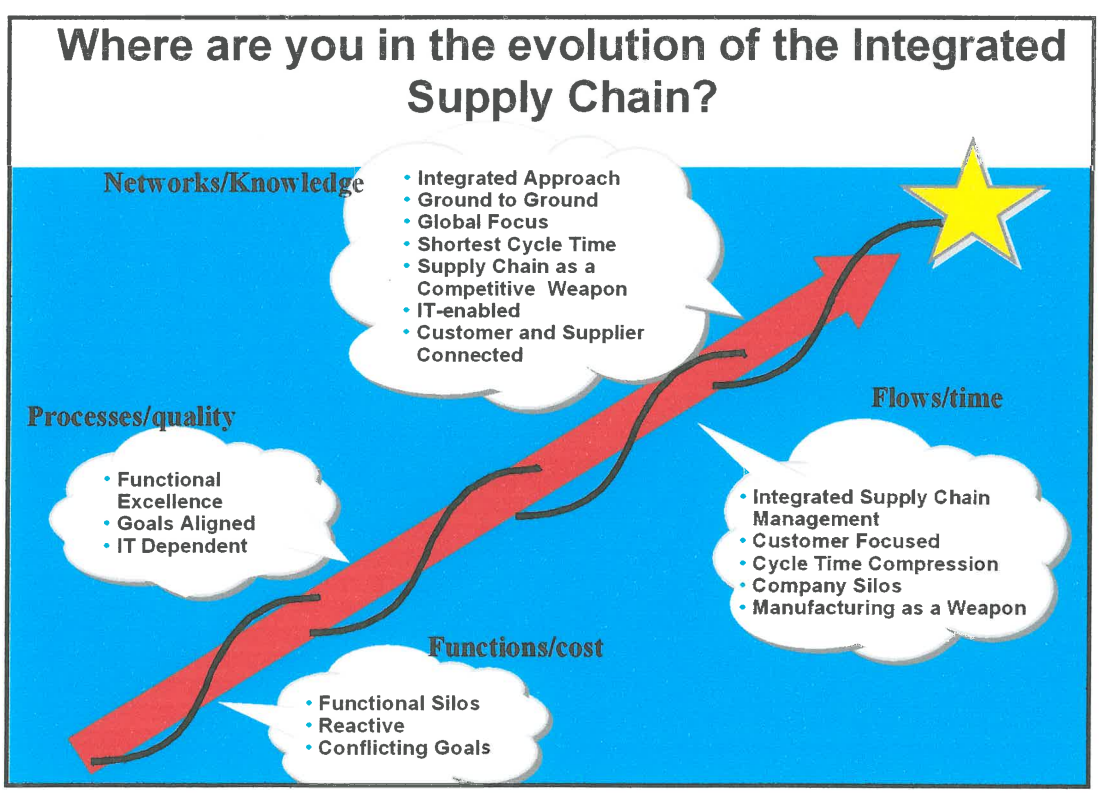


Figure 5-2 Gemini benchmarking scale [16. Gemini]

Ron Kubera from Manugistics (a consulting firm providing software and services for Supply Chain Management), used the following illustration to ask their client's opinion on their rank as a market leader.

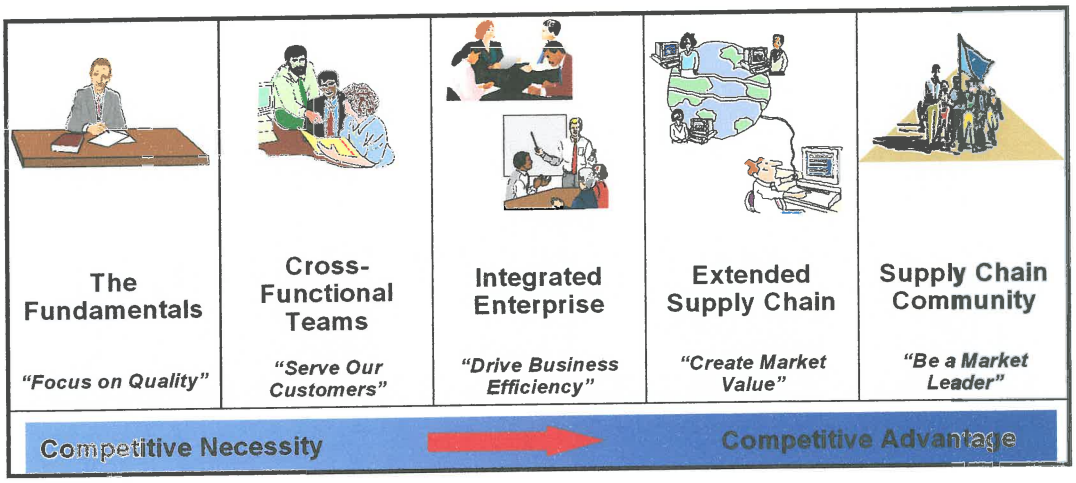


Figure 5-3. Ranking as a Market leader [27. Kubera]

To support this generic benchmarking rating they use the following matrix to ask clients to define their major business pain regarding their Supply Chain. Related to these 'business pains' Manugistics then identified resulting strategy and actions to be taken.

	The Fundamentals	Cross Functional Teams	Integrated Enterprise	Extended Supply Chain	Supply Chain Communities
Business Pain	Cost of Quality	Unreliable Order Fulfilment	Cost of Customer Service	Slow Growth Margin Erosion	Non-Preferred Supplier
Driving Goal	Quality and Cost	Customer Service	Profitable Customer Responsiveness	Profitable Growth	Market Leadership
Organisational Focus	Independent Departments	Consolidated Operations	Integrated Supply Chain (Internal)	Integrated Supply Chains (External)	Rapidly Reconfigurable
Process Change	Standard Operating Procedures	Cross Functional Communications	Cross Functional Processes	Customer Specific Processes	Reinvented Processes
Metric	Predictable Costs and Rates	On-time complete delivery	Total Delivered Cost	Share of Customer	Net Worth
IT Focus	Automated	Packaged	Integrated	Inter Operable	Networked
Key Tools Planning	Spreadsheets	Point Tools	Enterprise Supply Chain Planning	Point-of-Sale Supply Chain Planning	Synchronised Supply Chain Planning
Execution	MRP & Other Home-grown Applications	MRP II	ERP	Customer Management Systems	Network Centric Commerce

Table 5-1 Business pains related to resulting strategies [27. Kubera]

The following figure illustrates a roadmap to becoming a market leader according to Manugistics. [27. Kubera] Each time certain benchmark initiatives must be accomplished to reach the next rank of market leadership.

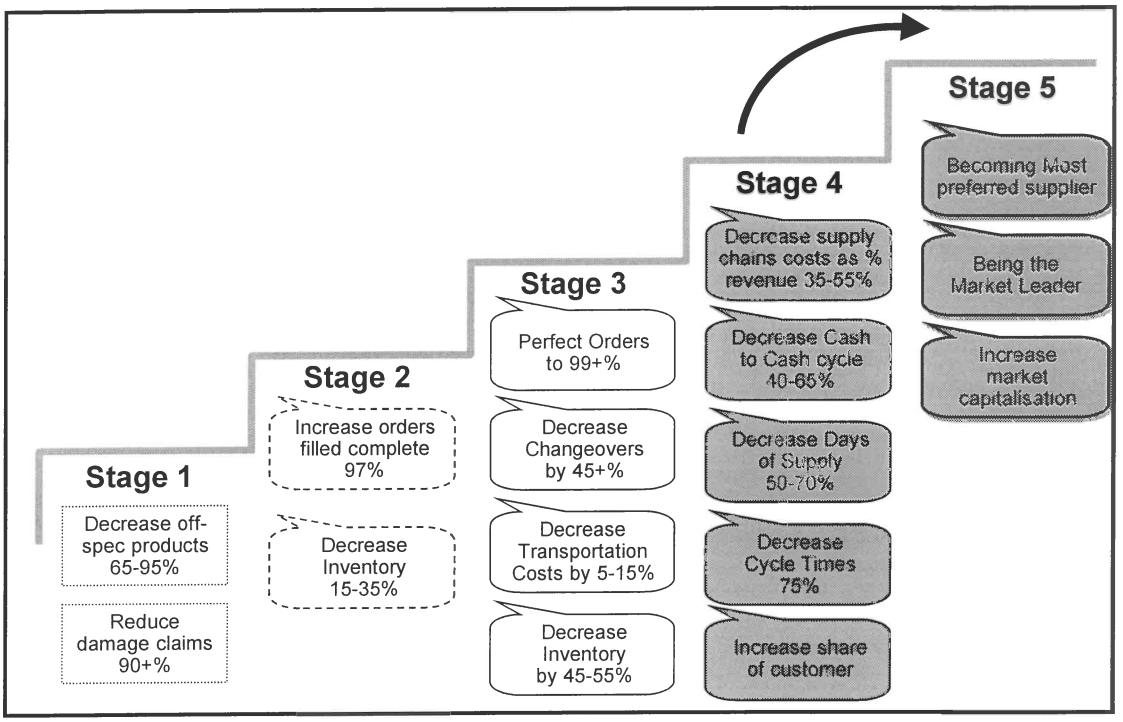


Figure 5-4 Roadmap to becoming a market leader [27. Kubera]

To generally identify benchmarks in the industry, indicators are needed from market leaders that can be used as measures. If an organisation has good ties with certain market leaders, such as filial companies, benchmark measures can simply be exchanged and used for comparison. If information needs to be obtained from competitors, external survey or consultancy companies can be used. Alternatively literature studies of leading companies' year-end reports and academic articles can also provide benchmark information. Specifically case study articles would provide pertinent references from initiatives undertaken by market leaders.

Best practices, on the other hand, are certain manners of conduct that must exist in a process. It can be implemented, or followed to varying degrees, but it cannot be used as some comparative yardstick. Sometimes best practices have to be incorporated into a process in order to achieve a certain benchmark. To achieve a best practice within a process, one of the following three options can be used:

1. A best practice can be designed into a process. This means some key enabler (such as a bar-code reading system) are implemented and utilised within a process.

2. A process can be designed around a best practice. A specific best practice concept (centralised purchasing via a company wide ERP system as example) are taken and then the processes are redesigned to ensure workability of the best practice.

3. A process is transformed into a best practice. This would require reinvention of a process with no prerequisites or predefined outcomes.

During To-Be designs, knowledge of best practices is best used as enablers to direct the energy of redesigning workshops. In the implementation of To-Be designs, activities to close the gap between the existing methods and the desired best practice, should be the main focus.

To identify best practices in industry, concepts that are known to practically improve operations must be spotted. Often these improvement concepts can also be referenced in literature. In fact, the best source for best practices remains theory in the form of up-to-date textbooks and articles (academic and business). The challenge is making the theoretical concepts work in practice, thus each organisation needs to customise theoretical best practices into workable solutions for themselves. Articles with case study examples, conference presentations, and consultants with exposures to various industries can provide useful guidelines to identifying, customising and implementing best practices.

5.5 Best Practices and Benchmarks Conclusion

During this chapter, various forms of benchmarks, and only a handful of best practices were named and explained. The purpose of these explanations was mainly to indicate the format of these philosophies, rather than detail workings and knowledge of the concepts. The importance though, is that benchmarks and best practices are useful, if not compulsory during BPR.

Benchmarking's main role in BPR is to serve as reference during As-Is analysis, and to serve as a gauge for establishing an Aspirational picture.

Best Practices are most useful to focus attention during To-Be designs and Implementation phases. Take into consideration though, that Best Practices can either be a cause or an effect of re-engineered processes. When focussing on Best Practices, first distinguish between best practices addressing the cause for improvement (examples: Concurrent Engineering, SLA's, JIT), and Best Practices that is a result of improvements (examples: Customer Value, Employee Empowerment, TQM). Reversed engineering have to be applied on Best Practices that was as result from improvements, and those improvement have to be focussed on, such as:

- QFD and setting SLA's to achieve customer value,
- Job restructuring and implementing teamwork to achieve employee empowerment,
- Implementing SPC methods and continuos improvement to achieve TQM.

6 Project Management of BPR projects

6.1 Project Management Introduction

The Project Management style is a somewhat different form of management as the usual operation management style. This is caused by the intrinsic differences between operations and projects. A project is a *temporary* endeavour undertaken to create a *unique* product or service. Its temporary nature implies that it has a definite beginning and end, and uniqueness implies specific differences from similar products or services. Project Management is thus that application of knowledge, tools, and techniques to project activities to meet or exceed stakeholders' expectations from projects. [45. Siemens AG] BPR initiatives in itself cannot be described in any other way as unique, for each of its occurrences, even if in the same organisation. Therefore the need to approach the initiative as a project, and apply Project Management principles to it.

6.2 Chapter objective

Project Management is a topic that is well covered in literature both holistically and its various facets. After a recent internet search on 'Project management', using the Alta Vista search engine, 270485 Web pages were found. Trying to describe the total topic in one chapter would be ridiculous, thus in this section only a generic overview of project planning and managing actions will be discussed. Some attention will be given to specifics such as project phases, configuration management, and control, which has direct implications on BPR projects. The Sietel BPR project will be discussed as a case study for managing project structures and teams in practice.

6.3 Generic Project Management principles

6.3.1 Project Management overview

Michael Greer's book: "The Project Manager's Partner' (1996) is written and organised around 20 Key Project Manager Actions and Results. The Table below describe these 20 Actions, which are organised according to their support of the Five Essential Project Management Processes: initiating, planning, executing, controlling, and closing. [43. Greer]

Action	*Results of Successful Performance*
	Initiating
1. Demonstrate project need and feasibility.	• A document confirming that there is a need for the project deliverables and describing, in broad terms: the deliverables, means of creating the deliverables, costs of creating and implementing the deliverables, benefits to be obtained by implementing the deliverables.
2. Obtain project authorisation.	• A "go/no go" decision is made by the sponsor. • A project manager is assigned. • A "project charter" is created which: • Formally recognises the project

	• Is issued by a manager external to the project and at a high enough organisational level so that he or she can meet project needs • Authorises the project manager to apply resources to project activities
3. Obtain authorisation for the phase.	• A "go/no go" decision is made by the sponsor which authorises the project manager to apply organisational resources to the activities of a particular phase • Written approval of the phase is created which • Formally recognises the existence of the phase • Is issued by a manager external to the project and at a high enough organisational level so that he or she can meet project needs
Planning	
4. Describe project scope.	• Statement of project scope • Scope management plan • Work breakdown structure
5. Define and sequence project activities.	• An activity list (list of all activities that will be performed on the project) • Updates to the work breakdown structure (WBS) • A project network diagram
6. Estimate durations for activities and resources required.	• Estimate of durations (time required) for each activity and assumptions related to each estimate • Statement of resource requirements • Updates to activity list
7. Develop a project schedule.	• Project schedule in the form of Gantt charts, network diagrams, milestone charts, or text tables • Supporting details, such as resource usage over time, cash flow projections, order/delivery schedules, etc.
8. Estimate costs.	• Cost estimates for completing each activity • Supporting detail, including assumptions and constraints • Cost management plan describing how cost variances will be handled
9. Build a budget and spending plan.	• A cost baseline or time-phased budget for measuring/monitoring costs • A spending plan, telling how much will be spent on what resources at what time
10. Create a formal quality plan. *(optional)*	• Quality management plan, including operational definitions • Quality verification checklists
11. Create a formal project communications plan. *(optional)*	A communication management plan, including: • Collection structure • Distribution structure • Description of information to be disseminated • Schedules listing when information will be produced • A method for updating the communications plan
12. Organise and acquire staff.	• Role and responsibility assignments • Staffing plan • Organisational chart with detail as appropriate • Project staff • Project team directory
13. Identify risks and plan to respond. *(optional)*	• A document describing potential risks, including their sources, symptoms, and ways to address them
14. Plan for and acquire outside resources. *(optional)*	• Procurement management plan describing how contractors will be obtained • Statement of work (SOW) or statement of requirements (SOR) describing the item (product or service) to be procured • Bid documents, such as RFP (request for proposal), IFB (invitation for bid),etc. • Evaluation criteria -- means of scoring contractor's proposals • Contract with one or more suppliers of goods or services

15. Organise the project plan.	• A comprehensive project plan that pulls together all the outputs of the preceding project planning activities
16. Close out the project planning phase.	• A project plan that has been approved, in writing, by the sponsor A "green light" or okay to begin work on the project
17. Revisit the project plan and replan if needed.	• Confidence that the detailed plans to execute a particular phase are still accurate and will effectively achieve results as planned.
Executing	
18. Execute project activities.	• Work results (deliverables) are created. • Change requests (i.e., based on expanded or contracted project) are identified. • Periodic progress reports are created. • Team performance is assessed, guided, and improved if needed. • Bids/proposals for deliverables are solicited, contractors (suppliers) are chosen, and contracts are established. • Contracts are administered to achieve desired work results.
Controlling	
19. Control project activities.	• Decision to accept inspected deliverables • Corrective actions such as rework of deliverables, adjustments to work process, etc. • Updates to project plan and scope • List of lessons learned • Improved quality • Completed evaluation checklists (if applicable)
Closing	
20. Close out project activities.	• Formal acceptance, documented in writing, that the sponsor has accepted the product of this phase or activity. • Formal acceptance of contractor work products and updates to the contractor's files. • Updated project records prepared for archiving. • A plan for follow-up and/or hand-off of work products
From The Project Manager's Partner © *Copyright 1996, Michael Greer & HRD Press*	

Table 6-1 20 Key Project Manager Actions and Results [43. Greer]

Kerzner, in his book "Project Management" (1996), segmented a project into the same lifecycle phases as Cleland and King (1975) did for system lifecycles [5. Kerzner]:

1. **Conceptual phase** – which is the preliminary evaluation of the idea, with a preliminary analysis of risk, and the resulting impact on the time, cost and performance requirements on company resources.
2. **Definition phase** – is mainly a refinement of the elements described in the conceptual phase. This includes a set identification of the resources required with realistic time, cost and performance parameters.
3. **Acquisition / Production phase** – is mainly a testing and standardisation effort before the operations begin. Most of the documentation must be completed in this phase.
4. **Operational phase** – integrates the project's products and services into the existing organisation. If a marketable product has to be produced from the project, market introduction, growth and maturity would also be part of the phase.
5. **Divestment phase** – is basically the reallocation of project resources, answering the question: "Where should the resources be reassigned?".

6.3.2 Project Life-Cycle phase descriptions

By breaking a project up into its various life-cycle phases, it becomes more understandable in terms of what needs to be done, and more manageable in terms of using a systematic approach. These generic life-cycle phases described in the previous paragraph, can thus be related to specific project management activities performed in each one of those phases.

The Conceptual phase relate to Greer's Initiating actions. This stage is mainly occupied with interaction between the project manager, customer and executives to clear out what the project objective is, and if it is worth the risk and costs. A Charter is one of the key deliverables from this stage, which documents the project manager's authority, responsibility and also set the scope of the project.

The 2nd and 3rd phases of the project relate to Greer's Planning actions. Because planning contribute such a crucial role to project success, it take up 14 out of the 20 steps in Greer's model. Kerzner described general planning as determining what should be done, by whom, and by when, in which order, or how to fulfil the assigned responsibility within allocated time and budget. [5. Kerzner] To do effective project planning the following information requirements must at least be obtained:

- Statement of Work (SOW) – a narrative description of the work required for the project.
- Project specifications – a list of specifications that are used for man-hour, equipment and material estimates.
- Milestone schedules – the project start and end dates as well as any other milestones such as review meetings, prototype deliverables or report hand-ins.
- Work Breakdown Structure (WBS) – is a product oriented family tree subdivision of the hardware, services and data required to deliver the end product. This is structured in accordance with the way the work will be performed and reflect how costs and data will be summarised.

The operational phase speaks to Greer's Executing and Controlling actions. This is the part of the project where everything is happening and it is vital the proper management takes place in terms of measuring, evaluating, and correcting:

- *Measuring* is done through formal and informal reports by determining the degree to which progress is made towards the objective.
- *Evaluating* is done by determining the cause of deviations from planned performance, and ways to act on these deviations.
- *Correcting* is done by taking control action to correct an unfavourable trend.

In addition it is extremely necessary to manage the project team during this phase. Probert remarked the primary reason for non-success of a project is the failure to generate team spirit within

the project team, and the lack of experienced project managers. [31. Probert] He suggested to ensure effective team working during project execution, the following conditions must be addressed:

- Team selection – A project team has to be built and cannot simply be made up of random elements thrown together, thus initial selection is one of the more important aspects of management.
- Team ownership – The team must be capable of taking ownership of all aspects of the project including scheduling, design, costs, and the power to make changes and accept specification changes.
- Team structure – Effectively each member of the core team is a project leader within his own discipline, and must contribute and manage their own area of expertise.
- Team customers – Normally there are two customers: the 'real' customer and the company management. The project manager is the main point of contact with these customers.
- Team support – Senior management must be seen to back the team. Preferably one senior person should act as champion / coach to review project status and help the team with generic problems within the company.

The final phase focuses on closing the project off and separating the team. It is necessary that project do not drag on, mainly because of the cost involved and boredom that sets in. With regard to progress reporting Probert warn that the 90% rule must be avoided: everything proceeds as planned up to 90%, then progress gets stuck while spend continue at normal rate. Progress meetings can also have around 20 occurrences before boredom sets in.

As mentioned before, the lifecycle phases mentioned in the previous paragraph were generic project lifecycles that were deducted from system lifecycles. These lifecycle phases will obviously differ for various types of projects. The table 6-2 indicate the different lifecycle phases for various industry related projects [5. Kerzner & 16. Gemini].

Engineering	Manufacturing	Computer Programming	Construction	BPR
• Start-up • Definition • Main • Termination	• Formation • Build-up • Production • Phase-out • Final audit	• Conceptual • Planning • Definition and design • Implementation • Conversion	• Planning, data gathering and procedures • Studies and basic engineering • Major review • Detail engineering • Detail engineering/ construction overlap • Construction • Testing and commissioning	• Opportunity identification • Project design and costing • Detail process analysis • Process redesign • Implementation • Embedding and sustaining

Table 6-2 Life-Cycle phase definitions [5. Kerzner 1996 & 16. Gemini]

As can be seen, even though these life-cycles differ, all these examples go though a cycle of project initiation, project planning and operation, and project finalisation. Making use of the life-cycle approach for BPR projects in particular is critical to managing the projects. The BPR project life-cycle phases relates directly to the BPR methodology, thus the methodology have to be understood thoroughly to be able to manage the project.

6.3.3 Controlling and measuring project progress

The ultimate objective of Project Management is to utilise available resources to achieve the project goal, while maintaining an optimum balance of time, cost and technical performance

6.3.3.1 Elements of Project Management

As mentioned earlier, to do effective project planning, a SOW, project specifications, milestone schedules and a WBS must clearly be defined. Projects are managed according to these elements.

A project starts out as a **Statement Of Work (SOW).** This is a written description of the objectives to be achieved, a proposed schedule with start and finish dates, performance measures in terms of budget and completion steps (milestones), and written reports supplied.

Project Specifications can be seen as standards for pricing out a proposal. It is the project element that depend on engineering inputs, both from the customer and suppliers/contractors, to ensure that proper standards are identified to which the project deliverables must comply. Defining of these standards provide an indication of the efforts, and thus costs required for the project. This ensures no surprises for a customer downstream.

Milestones are specific events to be reached at certain points in time. The date when the project must be completed is obviously the most important milestone. To ensure though that this milestone will be reached, preliminary milestones must be put in place that will help to measure the progress of the project. How time schedules with milestones are measured, will be discussed in the next section under project controlling techniques.

After the objective, time, costs, and project team are specified, a **Work Breakdown Structure (WBS)** has to be done. WBS is a subdivision of the objective into smaller and smaller pieces, which clearly defines the objective in its totality and contributes to its understanding and success. The WBS usually has the following structure:

1. Project
    2. Tasks
        3. Sub-tasks
            4. Work Packages

Tasks and sub-tasks are used to subdivide a project into more manageable pieces.

A work package is a group of activities which is combined and assigned to a single organisational unit. Such a work package in itself provides a description of what needs to be done, the dates when it will start and end, its budget and its measures of performance. [45. Siemens AG]

6.3.3.2 *Project Controlling Techniques*

The main factors that usually have to be controlled via project management are resources, which are tied to costs, and time schedules. Popular time orientated techniques to measure progress against time, are Gantt charts, PERT and CPM.

Gantt charts are visual bar charts, which show both the amount of time and the sequence of activities that have to be performed. The picture below is an example of an Gantt chart.

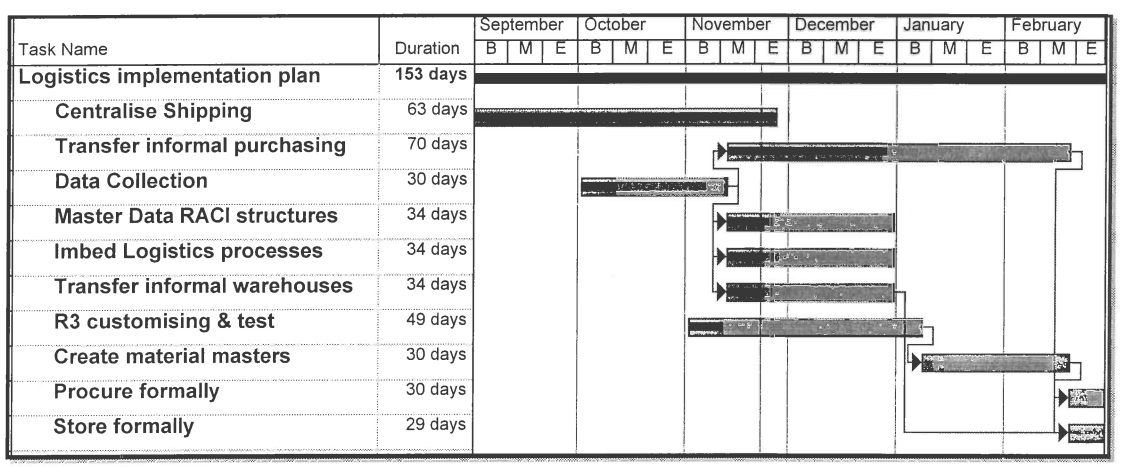


Figure 6-1 Gantt chart example.

Because Gantt charts focus on the timing of activities, it is the most ideal tool to measure what activities should be done at what date. It also effectively demonstrates activities that need to be performed in parallel, and the critical path activities.

PERT (Program Evaluation and Review Technique) and CPM (Critical Path Method) are both network diagram tools used to analyse, describe, plan, monitor and control project sequences. In large projects, network diagrams are the best means of co-ordinating and controlling operations. It consist of graphical representations of the logical links between activities, and illustrates the timing of all activities and their dependencies. From a network diagram, time schedules, Gantt charts and resource plans can easily be created. [45. Siemens AG]

Both the PERT and CPM techniques finds the longest time consuming path, called the critical path, in a network diagram, and focus on this critical path as a basis for planning and controlling a project. The critical path is thus the constraint that determines the minimum time needed for project completion. When using critical path scheduling, it is important for projects to have the following characteristics:

1. Well defined tasks whose completion marks the end of a project.
2. The tasks are independent, thus they can be started, stopped, and conducted separately within a sequence.
3. Tasks are ordered and must follow each other in a given sequence.

Typically construction and large engineering projects meet these criteria. Conversely the tasks of BPR projects are not well defined in terms of time, and are dependent on each other, which cause critical path scheduling to be less effective for BPR projects. Network charts are useful to identify the sequence of BPR tasks though, but usually Gantt charts are the most effective for planning BPR projects. A critical path can also be identified on a Gantt chart, but it becomes very complex if there are more that 20 to 30 activities on the chart.

6.3.3.3 Configuration Management

Configuration management is a critical tool employed to control configuration changes to projects. [5. Kerzner] It comprises of:

- Activities for defining project results in terms of components and features,
- Controlling desired changes and improvements of the results,
- Avoiding undesired and unforeseen changes,
- and documenting and archiving all job results.

This control technique is basically a orderly process for the formal review and approval of configuration changes. It requires a committee that consist of the customer, the contractor and the group initiating the change. This group have to review any suggested changes in terms of its cost, quality, is it justifiable, and what is its impact on the project. If Configuration Management is properly implemented and managed, it will provide:

- Appropriate levels of review and approval for changes.
- Focal point for suggesting and approval of change.
- Better communication of any changes to both the customer and staff.
- Ensuring better technical intelligence, no frivolous changes and reduced confusion concerning changes.
- A paper trail of the initial scope and objectives, with any subsequent changes recorded.

For BPR projects it is very important to initially define the scope of the project, and even though it is hard to quantify the deliverables, an agreement has to be reached before the project commences. This agreement is the baseline deliverable of the project, and any changes to the scope of this baseline

needs to be approved by a steering committee that consist of both the customer (organisation management) and contractor (consultants).

6.3.4 Management of BPR project teams

When teaming people up for a project, one of three organisational structures are usually used for project management [5. Kerzner]:

- A **pure project team** structure (nicknamed skunk works) where a self contained group works full time on the project. These type of project teams are usually for intensive projects such as BPR.
- **Functional project teams** are housed within a functional division. The team operate very much the same as normally, it is only the tasks and deliverables that distinguish operations as a project.
- **Matrix structure project teams** blend the properties of functional and pure project structures. Each project utilises people from different functional areas. The project manager decides what and when tasks will be performed, but the functional managers control which people and technologies are used. Engineering and construction type projects often utilise matrix structure project teams

For most people working in teams is different from working alone. Specialised techniques and management styles are required to help teams maintain focus and develop common understanding of issues. Team work requires a structured approach to avoid:

- Vague problem definitions
- Groups that argue and go off on tangents
- People being unhappy with the proposed solutions
- A lot of time spend with nothing accomplished
- No follow through of solutions

Successful management of teams draws the collective best from the members in a co-operative manner. This results in solutions that are implemented through action plans and commitment of the total team.

6.3.4.1 Structure of the project team

As mentioned, it is often the rule that a pure project team performs BPR projects. These teams then consist of a project leader, a facilitator and team members or resources.

The project leader is accountable for the re-engineering exercise. He is also the person responsible for decision making within the team. The main roles of the team leader are to stay focused on the re-engineering activities and reinforce the efforts of the team. The ideal is to have only one dedicated project leader.

The facilitator acts as a catalyst in the group and assisted the group in working together effectively. His role is to focus on the process of re-engineering, and the context in which the re-engineering is performed. The reasoning is that the facilitator is not an expert of the processes and avoided making content contributions, but helps the team to get more done in less time by means of team building and developing other's ideas.

The team members, or resources are the process experts and have the responsibility of helping the leader with the re-engineering. They are the ones that contribute ideas and follow the action plans under the guidance of the facilitator.

6.3.4.2 The format of team operation

The project team itself works in continuos loops of Plan – Do – Review, which consist of the following steps [16. Gemini]:

1. A task (such as planning a workshop) would start with a PDR meeting. All the planned activities that have to be done are discussed and written down on a flipchart. Next to each activity the person's initials who is responsible for performing the task, and the date by when it should be completed are written. Such a list of tasks with names and dates were called Next Steps. A date and time also has to be set for the next PDR meeting when these Next Steps will be reviewed.

2. The project team then have to go and do the activities, such as preparing presentations for the workshops and arranging appointments, ect.

3. On the next PDR meeting the flipchart with the Next Steps will be reviewed for completeness of activities. After the review of the previous Next Steps, the planning for the next activities will already be incorporated into the meeting. Thus the PDR meetings have the dual purpose of Reviewing and Planning. See the illustration below for an example of an agenda for such a PDR meeting. The flipchart of Next Steps is always a 'live' list with completed activities scratched out, and new activities added on. Such a PDR meeting is finished with capturing Benefits and Concerns (B&C's):

- Benefits being positive comments about the meeting or project progress. Benefits were always mentioned before concerns were raised.

- Concerns were issues that the team felt must be addressed. A concern was always started with the words "How to / (H2)", or "I Wish I Knew /(IWIK)".

- The concerns are then converted into Next Steps and the PDR loop continued.

	Agenda Item	
08.30 - 08.35 (5min)	Agenda Review	AC
08.35 - 08.40 (5min)	Review Previous Next Steps	WB
08.40 - 08.45 (5min)	Meeting Objectives	AC
08.45 - 09.05 (20min)	Discuss Core Skills	PdS
09.05 - 09.20 (15min)	Benefits Tracking	AL
09.15 - 09.25 (5min)	Benefits & Concerns	AC
09.25 - 09.30 (5min)	Next Steps	WB

Next Steps		
• Clarify the split rule between Technology solutions and Networks - set-up meeting	DL	20 /04
• Identify people doing NE functions	WdP/RK	22/04
• Sort out issues with Carrier Telkom regarding NE functions	DL/CK/AB	26/04
• Include in pre-present:	CK / DL	
– Functional matrix		
– Network Engineering / Technology Solutions split		
– Network Engineering mission		
– Network Eng. & Project Eng. Integration with Advantages / Disadvantages		
• Clear out Network Engineering name with Martin Sanne	FS	29/4
• Get org chart agreement with Ray Khoza & Anthony Pickering	WdP	30/4
• Forward NE matrix, tasks & mission slides to CK/DL	WdP	27/4
• E-Mail Next Steps to meeting attendees	CK	27/4

Figure 6-2 Next Steps and Agenda examples.

6.4 Managing the Sietel BPR project

6.4.1 The organisational structure of the Sietel BPR project

Initially seven Sietel employees and 4 consultants would have been involved in this project for 7 months. These members had to work full-time in a pure project organisation structure and were known as the BPR project team. This BPR project team was under the dual lead of a Sietel manager and a Consultant Project lead. These two project leaders were responsible for the so called project governance of this BPR project. The project team itself was also further divided into work streams, which were responsible for focussing on specific areas in the BPR process, namely:

- Benefits Tracking
- Supplier orientated processes
- Customer orientated processes
- Services processes
- IT support

The progress of this BPR project was overseen by an Executive Steering Group (ESG) which consisted of the board of senior executives. They had to provide direction and support to the project team, make decisions and remove organisational barriers. In addition each of these executives had to act as a coach to one of the sub-divided work streams. The role of being coach were to support the key initiative of the work stream by providing guidance, eliminating barriers and reviewing recommendations. These coaches had to meet with their work streams at least once a week to discuss their progress. The Steering Committee then convened every 2 weeks and each coach had to report on the progress of the work stream he was overseeing.

Within Sietel this project structure of Project Governance, with the project team sub-divided in work streams, and the ESG overseeing the progress, allowed for the dynamic management required for BPR. As deeper analysis were done of the business processes, it was realised that the project structure and the original project team had to adapt. For example, it was realised that more effort had to be spend on the re-engineering of the services processes than initially planned. Thus a work stream for services had to be formed as well, and additional resources added to the project team. Thus the project team ended up consisting of 8 Sietel employees and 5 consultants in addition to the two project leaders.

6.4.2 The motions of implementing teamwork for BPR.

Teamwork does not simply just happen, it has to be implemented and managed. That is why there had to be proper structures for teamwork with team leaders, facilitators and coaches within Sietel. These structures were applied for all the different types of teams that were utilised during the BPR project, which were:

- The BPR project team itself,
- Cross Functional teams that redesigned various parts of the process,
- And implementation teams, which consisted of the process owners implementing the processes.

To get these teams going, a process of team implementation had to be followed. During Sietel's BPR project a fairly generic process of team implementation was used, and only slightly altered for the various types of teams:

1. The task or opportunity for the specific team had to be identified clearly in terms of the problem process that has to be investigated, redesigned or implemented.
2. Management then had to decide the relevance of the opportunity for various areas, and who the best people would be for investigating the opportunity. Thus for each opportunity the team members, the leader, facilitator and coach had to be identified.
3. The team is onboarded with the following actions:
   - Training on all relevant techniques and tools.
   - Defining the objective, tasks and expectations from the team.
   - The team identifies their expectation from management.
   - Identification of the problem, what needs to be delivered and what are the success criteria. This is captured in a charter along with the scope of the project.
4. The team operates in continues loops of Plan-Do-Review involving the team itself, its leader and coach.
5. The progress of how the team is reaching its objective is monitored on a regular basis by means of internal PDR meetings twice a week, feedback meetings once a week with the coaches, and feedback presentations to the Steering Committee every two weeks.
6. Once the team's objective is fulfilled according to the initial opportunity and charter, feedback is given to the management and Steering Committee, and an "accomplishment permit" is requested.
7. If the Steering Committee is satisfied with the teams results and award the "accomplishment permit", the team is "disassembled', which indicate no further need of the team due to reaching of its goal.

During the BPR project the business improvement was the main benefit, but teamwork was a 'way to the mean' with the following benefits:

- Greater variety of problems could be tackled.

- Problems were exposed to a greater diversity of knowledge.
- Participation boosted morale and ownership.
- Cross functional / divisional problems could be dealt with.
- Recommendations were more likely and easier to implement than individual suggestions.
- The teams were action-oriented, optimistic, and pro-active.
- Teams got things done; they were achievement-oriented and goal focused.
- Teams were flexible and creative.

Thus except for the benefits cases from BPR in Sietel, implementing teamwork structures in Sietel also had various benefits, both tangible and intangible throughout the whole organisation.

6.5 Project Management conclusion

Project Management as a management philosophy focuses on:

- Proper identification of project scope, objectives, and deliverables.
- Thorough planning of tasks, resources and costs to accomplish project deliverables.
- Control techniques to monitor project progress.
- Situational driven management of activities, while controlling changes through configuration management.
- Special organisation structures to manage teams of resources.

These characteristics make Project Management viable for controlling and managing BPR projects.

In this chapter the life-cycle phases were also discussed, and alternatives for various types of industries were demonstrated in table 6-2. Thus it can be concluded that the project life-cycle approach can have a close relation to the BPR approach, which suggest that an integration of the two structures can help to ensure successful management of BPR exercises.

7 Implementation Drivers

7.1 Implementation Drivers Introduction

When Jack Welch became CEO of General Electric (GE) in 1981, he started a transformation process that took more than a decade, and is still continuing. He admitted that it nearly took a decade just to make his organisation understand the message of transformation. During this process he discovered and utilised some very specific implementation drivers for transformation.

To communicate his vision for GE and implementing his values, Jack Welch seized the "revolutionary's three main levers of control" as he called them, namely 'the police, the media, and the schools'. These three institutions forms the most effective means of influencing a population at large, and corporations have the own equivalents of each:

- GE's "police" were the functions of strategic operation planning and finance staffs, who reviewed every operating decision and supervised the allocation of capital.
- The "media" included everything form executives' speeches, publications in employee magazines and even corporate annual reports.
- The GE corporation's "schools" were represented by the training courses, seminars and workshops, which managers were send to annually for training.

But even after 7 years of continuously applying these three main levers, Welch realised there were still managers further down in the organisation that still did not see the need to change. These were the unimaginative, bureaucratic bosses-from-hell that demanded that fewer people still do everything and more than they used to do. They did not share Welch's values and pushed their subordinates hard to achieve earnings results. It felt to Welch that the police, media and schools had failed him and something else had to be done. The concept he came up with, he explained as follows: "We got to put the person who knows the answer to these frustrations in the front of the room. We've got to force the leaders who are not walking the talk to face up to their people". This was the start of the concept that GE called 'Work-Out'. The Work-Out program focussed on four major goals:

- **Building trust**: To benefit from employees' ideas, opportunity should be given to speak cordially without jeopardising careers.
- **Empowering employees**: The people closest to the problems usually know better than their superiors how it could be solved. It was needed to leverage the workers' knowledge and emotional energy.
- **Elimination of unnecessary work**: GE wanted higher productivity from its workers, but at the same time relief some of their stress.
- **A new paradigm for GE**: Welch wanted the whole organisation to participate in defining itself.

This approach of how Welch implemented transformation in GE is acknowledged as one of the biggest success examples in the business world. [10. Tichy]

7.2 Chapter Objective

In the same way as Welch focussed on certain elements to successfully transform his organisation, this chapter will explore implementation drivers for organisational re-engineering. Implementation theories from various literature studies on change management projects, re-engineering and the Balanced Scorecard successes will be reviewed. Deducting from these reviews five implementation drivers will be extracted and explained with reference to the Sietel Case Study, as well as Welch's control levers.

7.3 Implementation Frameworks

Professor Norman Faull, from University of Cape Town Business School, and two of his students, Nick Day and Tanja Klein, researched the characteristics of good implementation. They presented a paper [13. Faull et al] in which they stated that no matter what philosophy being implemented (TQM, BPR, Lean Production), success depend on the use and presence of certain critical success factors (CSF). Based on these CSF, Faull, Day and Klein created frameworks for implementation.

In their first framework, they refer to David Upton's course notes from Harvard Business School on "Design and implementing operational improvement strategies", which consist of seven elements that address generic questions on improvement strategies. These seven elements and questions being [34. Upton]:

1. Context and motivation	Why is the improvement initiative taking place? What is driving it? Why is the effort necessary?
2. Direction and goals	On what dimensions is performance to be improved? How will this improvement be measured? What will be externally visible results?
3. Focus	Where will we concentrate internally to achieve the desired goals? On what areas of the operation will the initiative focus?
4. Methods and techniques	How will we achieve the desired results? What will our "toolkit" be for this improvement effort? How will we ensure the tools are available?
5. Resources	What financial and human resources will be required? To what extend will external resources be needed?
6. Organisation and phasing	How will the initiative be organised? What groups will it involve? Who will lead it? What will be the order of the projects tackled and when will each begin and end?
7. Learning capture and leverage	How will knowledge be brought to the operation? How will what is learned in the initiative be captured? How will the achievements of this initiative be leveraged into the future projects?

These elements form the foundation layer in Faull, Day and Klein's first conceptual framework for implementation (✣ See table 7-1) The second and third layers take the organisation's culture and

innovation track record into account and test it against the innovation (such as a new process) itself. Klein made the observation that implementation effectiveness affects future implementation. Where the first 3 layers required pre-analysis, the fourth layer relates to the actual implementation. The final layer, called the surface layer, evaluates the results evident.

5. Evaluate the results from the implementation. Compare them with the goals set. Assess how widespread the innovation is in terms of the actual practice. Has the innovation changed the company? How has it affected the climate for future innovation?
4. The implementation approach includes the project management methodology, planning and control techniques, and communication means. Are the number and quality of people assigned to the implementation, and the funding level, sufficient?
3. The innovation itself needs to be assessed in terms of the findings on climate, values and history. To what extend does it fit? How radical is it as a departure from the norms?
2. The organizational context for the innovation needs assessing in terms of: ★ climate ★ culture ★values ★ and the innovation track record
1. The overall improvement strategy of the organisation ✣

Table 7-1 First Conceptual framework for implementation [13. Faull]

In their second conceptual framework for implementation, Faull, Day and Klein grouped related CSF under four category headings with sub-points:

1. Effective implementation requires **top management to be continuously involved** in establishing and maintaining a solid foundation on which to implement.
   - 1.1 Linking the initiative to strategies and overall company objectives (linking)
   - 1.2 Breaking down boundaries and removing obstacles (removing obstacles)
     - 1.2.1 Communicating and clarifying objectives (communicating)
     - 1.2.2 Building consensus and shared understanding (consensus)
   - 1.3 Adapting the organisation to the change process (adaptation)
   - 1.4 Appropriate resourcing of the implementation process (resourcing), including empowering adopters and implementation team (empowerment)
2. Effective implementation requires a **project management approach** to manage the procedural and administrative aspects of the initiative.
   - 2.1 Building technical competence (competence)
   - 2.2 Making use of pilot projects (pilots)
   - 2.3 Monitoring progress and planning tasks (monitoring and planning)
   - 2.4 Ensuring the procedures are well documented (documentation)
   - 2.5 Managing the design process (design)
3. Effective implementation requires an **adoption management approach** to gain the acceptance and commitment of users in the application of the initiative.
   - 3.1 Providing training, education and mentoring (training)
   - 3.2 Ensuring user involvement and participation (participation)

3.3 Providing effective feedback (feedback)

3.4 Defining roles, redeploying staff and redesigning jobs (role definition)

3.5 Allocating rewards (rewards)

3.6 Marketing the project internally (marketing) and not overstating the benefits (realistic benefits)

4. Effective implementation requires **the allocation of a unique set of human resources (project team)** that are specially equipped to execute the implementation.

4.1 Using cross-functional team-based problem solving (teams)

4.2 Being aware of users' needs (users needs)

4.3 Good interpersonal skills (interpersonal skills)

These categories of CSF were firstly measured against literature corroboration from some 16 change management gurus, and then against a case study of successful TQM implementation. Each time scores were assigned according to the strength of association with the CSF. Table 7-2 is a combination/summary of Faull, Day and Klein's related Framework tables for Literature Corroboration and Case Study results. (* Summed result)

Frame-work Number	Keyword	Totals from Literature Corrobation	% Score from Literature Corrobation	Total from Case Study	% Score from Case Study
1	**Top Management Involvement**		**33.3%**		**46.3%**
1.1	Linking	10		1	
1.2	Removing obsticles	5		3	
1.3	Adaption	3		3	
1.4	Resourcing & Empowerment	9		8*	
2	**Project Management**		**29%**		**4%**
2.1	Competence	4		0	
2.2	Pilots	3		2	
2.3	Monitoring and planning	5		0	
2.4	Documentation	4		0	
2.5	Design	7		0	
3	**Adoption Management**		**37.5%**		**33%**
3.1	Training	8		1	
3.2	Participation	5		2	
3.3	Feedback	7		3	
3.4	Role definition	7		0	
3.5	Rewards	5		1	
3.6	Marketing & Realistic benefits	4		6	
4	**Project Teams**		**50%**		**52%**
4.1	Teams	14		6	
4.2	User Needs	4		4	
4.3	Interpersonal skills	6		4	
1.2.1	Communicating	2		5	
1.2.2	Consensus	3		2	

Table 7-2 Literature Corroboration and Case study result for second implementation framework [13. Faull]

7.4 Succeeding at Re-engineering

Implementing an improvement strategy, or best practices, or setting out on a path of drastically changing an organisation for the better, will always require certain spoken and unspoken rules. These rules are not for the sake of keeping up with the bureaucratic way of doing things, but to harmonise and organise all efforts towards a single goal. To prevent contradicting impression from management about organisational re-engineering, it is suggested that management (rather than the organisation) adhere to certain rules. Hammer compiled a list of common errors to be avoided in order to succeed at re-engineering. Measured against common sense, plus experience from practice, this list of errors is applicable to nearly all change management projects [4. Hammer et al]:

- *Place prior constraints on the definition of the problem and scope of the re-engineering effort.* By limiting the attention of the project, or only requiring a specific process to be re-engineered, only a small part of the problem can be addressed. Often only the effect of the problem can be addressed, and the cause of the problem is outside the scope of the project.

- *Bury BPR in the middle of the corporate agenda.* Re-engineering requires so much focussed energy, that it have to be placed at the top of the corporate agenda, or left of totally. If energy gets too distributed over too many change projects, nothing will happen.

- *Allow existing corporate cultures and management attitudes to prevent re-engineering from getting started.* If attitudes such as short-term goal orientation or top-down management structures exist, which is contradictory to BPR, it must be identified and changed.

- *Skimp on the resources devoted to re-engineering.* BPR is an effort that needs time and attention from the organisation's best people in addition to direct senior management involvement. Skimpy resources send out signals of non-importance.

- *Try to make re-engineering happen from the bottom up.* Except for the not receiving any buy-in, two additional reasons why this won't work:

  1. Middle managers and 'frontliners' can not see the total process and don't have the right perspective.

  2. No middle management has the authority to handle cross-boundary problems.

- *Attempt to re-engineer when the CEO is two years from retirement.* During and after BPR the organisation needs a CEO that is bold enough to make changes and live it.

- *Fail to distinguish BPR from other business improvement programs.* The danger is that employees will see it as another 'fad of the month' from management.

- *Assign someone who does not understand BPR to lead the effort.* Seniority and authority is not enough. Who ever leads the project needs to understand the mindset, as well as the link between operations and finance.

- *Neglect peoples values and beliefs.* A BPR project must provide reason and motivation for employees to perform well in the new processes. The new management system must also cultivate these values.

- *Try to make BPR happen without making anybody unhappy.* Re-engineering will cause people to loose or change their jobs, and cause uncomfortableness in post re-engineering jobs. Trying to keep people happy will not deliver the dramatic results BPR should.

- *Pull back when people resist making re-engineering changes.* Resistance will happen. It must be expected and not allowed to set the effort back.

- *Dissipate energy across a great many BPR projects.* Re-engineering requires sharp focus and discipline due to limited time and attention from management. Don't go for everything at once.

- *Be willing to settle for minor results.* Due to factors such as resistance to change, and achieving some (± 10%) results with no or little effort, it is tempting to settle for incremental improvements instead of dramatic results. This sin called incrementalism, leads to even more complex processes and bigger resistance to change in the long run.

- *Drag the effort out.* BPR is stressful, so don't stretch it and take to long, because people become impatient, confused and distracted.

- *Quit too early.* The first signs of problems (resistance to change), or success (minor improvements) can cause management to forego the huge pay-offs from BPR at a later stage.

- *Ignore everything except process redesign.* Management systems, such as job ratings, department structuring, management authority and labour relations, needs to be changed in line with the redesigned processes.

- *Not focus on business processes.* Often organisations try to focus on the implementation of philosophies, such as teamwork and empowerment, which is the consequences of re-engineered business processes.

- *Concentrate exclusively on design.* Having redesigned processes and structures does not mean an organisation is re-engineered, it has to implement these processes as well.

- *Try to fix a process instead of changing it.* Because a process is already in place, it feels more sensible to improve it than change it. Yet this leads to incrementalism, which is the path of least resistance.

Most of these rules, or warnings are applicable to Management and the BPR team. Despite this extensive list of rules, there are still a lot of other ways of causing BPR to fail. It does though set the scene for the type of approach requested to implement re-engineered processes and if the drivers of BPR continue along these lines, some type of success should be possible.

7.5 Balanced Scorecard implementation

During the 1990's the rise of a new management methodology were seen. The Gartner Group estimated that "at least 40% of Fortune 1000 companies will implement a new management philosophy – The Balanced Scorecard – by the year 2000". [48. US Dept. of Commerce] From an Internet search the Balanced Scorecard delivered over 4000 hits (November 1999). Being the philosophy to be implemented of our time, and standing at the end of the 90's decade, Balanced Scorecard implementation seem to be an ideal example to scrutinise for successful implementation drivers.

Professor Claude Lewy of the Free University of Amsterdam, claims that 70% of Balanced Scorecard implementation fail. Based on research of seven European companies, Professor Lewy and Lex du Mee of KPMG set down "The ten commandments of Balanced Scorecard Implementation. The Table below sets down these 10 commandments [28. McCunn et al]:

The Ten Commandments of Balanced Scorecard Implementation

Do…	**In Other words…**
Use the scorecard as an implementation pad for strategic goals;	It can be an ideal vehicle for rolling the corporate strategy down through the organisation;
Ensure strategic goals are in place before the scorecard is implemented	Do not invent the strategy as you go along, or the scorecard will drive the wrong behaviour;
Ensure that a top-level (non-financial) sponsor backs the scorecard and that relevant line managers are committed to the project;	The scorecard project is too big to be anything other than top priority, and it should never be left to the accountants to do;
Implement a pilot before introducing the new scorecard;	It provides valuable lessons and avoid 'big bang' risks;
Carry out an 'entry review' for each business unit before implementing the scorecard.	This minimises the risk of going ahead in unfavourable circumstances and allows you to customise the project to suit your organisation's needs.
Do not…	**Because…**
Use the scorecard to obtain extra top down control;	People will rebel;
Attempt to standardise the project. The scorecard must be tailor-made;	Your organisation's strategic imperatives are unique – a ready made scorecard will not fit;
Underestimate the need for training and communication in using the scorecard;	Don't be fooled by the simplicity of the idea – you have to deal with the huge change it brings;
Seek complexity nor strive for perfection;	Avoid 'paralysis by analysis';
Underestimate the extra administrative workload and cost of periodic scorecard reporting.	Gathering information for the scorecard is more time-consuming than you think.

Table 7-3 The 10 commandments of Balanced Scorecard [28. McCunn et al]

Paul McCunn from KPMG, includes an eleventh commandment: do not start implementing a Balanced Scorecard unless you know what you are hoping to achieve. Implementing a balanced scorecard can have different objectives [28. McCunn]:

- **To change the way the business is run** – Managers start running their business by identifying the financial and operational factors that have the greatest effect on future profitability.
- **Create an awareness of non-financial measures** – The four standard perspectives provides a useful format to encourage managers to start thinking about the importance of non-financial measures.
- **Create a clear line of sight on the corporate objective** – A well designed scorecard helps managers link their actions and decisions to the corporate objective.
- **Communication of the business model** – Because the indicators in the scorecard are things that have to be done well if the organisation is to achieve its business goals, it helps staff to understand what makes the business tick.
- **It is a Trojan Horse for change projects** – The scorecard helps staff understand where the project is taking them and reduces uncertainty.

Managers have to be aware of these types of implications on their organisation, and should know what their exact objective is before implementing a Balanced Scorecard.

The CorVu Corporation, a supplier of an integrated suite of Enterprise Business Performance Management and Balanced Scorecard IT solutions, stated that "if the balanced scorecard has received any criticism, it is related to the effort involved in its implementation". [41. Corvu] Operation of the Balanced Scorecard requires locating and capturing performance data. This is typically a manual process and only serves to intensify the difficulty and complexity of implementation. It will also deter the continued use of the scorecard since the data will have to be regularly recaptured into the scorecard.

The Balanced Scorecard operation as a Management system, though becomes an iterative cycle and technology can be leveraged to automate this process. The ability to automate this management tool will then make it more widely available and practical, which will in turn promote acceptance of its use.

7.6 Main Drivers from the Sietel Experience

The previous three paragraphs have mainly discussed warnings and critical success factors for implementing new management philosophies. Each time guru authors gave lists of 'Do and Don't' rules, assuring that if implementers abide by these, their philosophy that they are trying to implement *should* be successful. But as Hammer stated "people are remarkably resourceful in finding ways to drop the ball" and abiding by the 'Do and Don't' rules will not necessarily guarantee success. [4. Hammer] Instead management must face the fact that they will make mistakes, but as long as they counter their mistakes by investing enough energy in critical success actions, implementation will be positive in its effects on the organisation.

From examining the implementation 'Do and Don't' rules in the previous three literature studies (as well as a couple of other articles from Kaplan, Kachellek, & Grover et al.), comments from these were compared with experience from the Sietel Case study. Some recurring rudiments emerged as critical success actions, or as the chapter heading implies, implementation drivers:

1. Assign appropriate ownership to re-engineered processes.
2. Campaign the objectives and later the results from re-engineering.
3. Proper planning and resourcing of the implementation phase and manage it as a business project.
4. Measure Key Performance Indicators regularly and make the result visible.
5. Utilise Information Technology tools as enablers for the new processes.

7.6.1 Appropriate Ownership

The need for top management commitment by this time goes without saying. Nearly each of the gurus mentioned thusfar in this dissertation stress the importance of high profile commitment. Appropriate ownership requires this commitment as a prerequisite, but goes beyond that in addressing Jack Welch's primary concern of "how to make the leaders walk the talk". [10. Tichy] This concern is addressed by assigning appropriate owners for new processes, and making them manage their new processes. Ownership has to be assigned at three levels:

1. Top management – For implementation to be successful, top management needs to ensure they have structured their organisation and aligned the strategy to accommodate the new processes. Imperatively a senior manager has to accept ownership as coach of the new process and resources that were assigned to implement and operate the new process.
2. Middle management – The manager that will be responsible for the new process in the future, must take over the ownership of the new process even before it gets implemented. No external consultant can implement a process for a manager. This new process owner must work with his

process team to implement the changes to the process, and as a group they must give feedback to their process coach.

3. Operational level – The future operators of the process must also be the process team to implement the new process. This process team must understand the significance of the process in the organisation's operations and accept ownership in supplying quality products or services.

In the Sietel BPR project, implementation of the Logistics processes was considered to be most successful. The main reason for this was that the new Logistics director, who acted as coach for these processes, relieved all his managers from their day to day activities and charged them with the task of implementing the new procurement, shipping and warehousing processes. [33. Tirisano] Jack Welch affirms this behaviour in his comment: "Managers had to know how to initiate change, how to accelerate it, and how to make it stick, people who are comfortable as coaches and facilitators will be the norm at GE. And the other people won't get promoted." [10.Tichy]

7.6.2 Campaigning objectives and results

Firstly the objectives of BPR, and then later on early successes, needs to be communicated to the organisation to promote buy-in for the implementation of re-engineered processes. The problem with communication though, is that every organisation always seems to have problems with it (solving all communication problems is one of those objectives with a constant scope creep). Campaigns to communicate BPR objectives can start of by means of:

- Roadshows and Brown Paper Fairs about BPR objectives, how new processes look and what is implementation progress.
- Publications about the BPR project in newsletters, e-mails and on the intranet.
- Competitions and awards for participation in initiatives and even just lucky draws for attending Brown Paper Fairs.

But to make organisational buy-in successful, campaigning has to be taken even further to achieve involvement. In a way campaigning has to achieve both Welch's media and schools leverages. This can be achieved through:

- Onboard training of all employees that need to participate during re-engineering, and training process teams on the designs of new processes later on.
- Getting operators and staff to validate processes on Brown Paper Fairs.
- Inviting employees to participate in workshops and be part of teams.

Brown Paper Fairs were experienced to be the most effective campaigning tool during the Sietel BPR project. Because of its 'low-tech, high-touch' characteristic everybody could easily relate to this form of communication and easily participate ideas onto a Brown Paper. Even after the BPR project

were implemented and finished, process teams looking at new areas of improvement still requested that Brown Papers should be build to communicate ideas to the rest of the organisation.

This example stresses the fact that communication in its simplest and most consistent form is the most effective. Jack Welch [10.Tichy] explained how communication evolved in GE: "We have learned a bit about what communication is not. It is not a speech like this, or videotape. It is not a plant newspaper. Real communication is an attitude, an environment. It's the most interactive of all processes. It requires countless hours of eyeball-to-eyeball back and forth. It involves more listening than talking. It is a constant, interactive process aimed at consensus".

Campaining is not only important during the course of implementing a new process or management philosophy, but is also important to continue after implementation. If an organisation is given feedback of the success accomplished due to implementing a new strategy, it will be more willing to trust management the next time an improvement initiative is undertaken.

7.6.3 Planning and Resourcing the implementation phase

One of the more difficult steps during BPR is moving from design phase into implementation phase. Process teams will have a lot of wonderful To-Be designs on one hand, and related As-Is processes on the other, and the question is how to manage transition from 'As-Is' to 'To-Be'.

When implementing a new process, there can be a hundred actions to do, but starting with 99 of them will only result in chaos. The challenge is how to start off with the one right initiative that will cause successful implementation of the whole new process. As one solution to this dilemma, experts with a strong theoretical background and a good understanding of practical operation, can be used to plan implementation. These experts must have the ability to bring theory to practice, conceptualise the new process' working, and plan a road for implementation. As another solution, the best practice that will be evident in the new process must be focussed on, with the attention on activities to put the best practices into place. Where the desired best practice is a result of a re-engineered process, aim implementation planning at putting enablers in place to achieve that best practice.

The effectiveness of running a pilot can never be underestimated. Unfortunately the time planned for running pilots are often underestimated. Pilots provide valuable lessons without over exposing the organisation to risk. With the running of an R3 project schedule pilot within Sietel it was found that the success from it, was a campaign in itself for organisational wide implementation.

Another dilemma during the implementation stage of BPR is resources. The fun work of redesigning new processes is finished, more often than not the consultants flee the scene, and nobody feels like confronting the resistance-to-change to implement the new processes. Top management must be aware that it takes more energy to implement processes than to design them. Even though the implementation job is duller and slower than the creative design phase, it is more complex due to confronting organisational resistance and solving teething detail problems. This was exactly what was experienced with the implementation of the Sietel BPR project. Thirteen full time resources were

involved during the design phases, but at the beginning of the implementation phase 10 of these decided to rather do other work. Management then realised the need for more resources and the implementation team was increased to 18 full time resources. The ideal resources at this stage should be the future process owners with members from the design teams acting as consultants to implementation.

Effective Planning and Resourcing, as part of the Project Management function of implementation, will nearly automatically lead into better monitoring and control of the implementation project, which in itself is vital to successfully control the changes brought about by re-engineering. Kachellek emphasised the importance to "Control the changes (do not go too fast nor too slow)". [23. Kachellek] In addition to these Project Management functions, the importance of finalising the paper work must be stressed. Here it is a case of the well known saying: "Nothing is done until the paper work is finished". The re-engineered process or implemented philosophies need to be captured into ISO 9000 procedures to support formalised sustainability.

7.6.4 Visible measuring of KPI's

When designing new processes, KPI's should be designed into the processes as part of its improvement. Once operators realise that KPI's provide transparency to processes for perceiving improvement and providing top managers with better insight into operations, an effort is made to make the KPI's look good. If the process was well designed, KPI improvement and process improvement were directly related.

In Sietel KPI's form the basis of Benefits Case and Balanced Scorecard results:

- Benefits Cases indicate the EVA by the BPR project, thus the ESG management wants monthly updates on these figures. The process owners understood the connection between the KPI's they had to provide and the related EVA benefit, due to their involvement in the creation of the Benefits Cases. The better their KPI's, the better they looked towards management financially, which in turn was a reflection on their processes.

- Sietel's Balanced Scorecard is based on an Executive Dashboard that segregates into various Departmental Dashboards with each having their own KPI's. Management requires regular feedback on Dashboards varying from monthly to annually, and if process owners have problems reaching targets, reasons have to be provided. In this manner attention can be given to processes that are still not properly implemented. Unfortunately data availability is a regular concern when it comes to KPI measuring, but as part of new processes or strategies, systems to provide relevant data must also receive attention during implementation.

In the areas where management had interest in KPI's, the relevant process owners made an earnest to implement new improvements in order to improve performance.

7.6.5 Use IT enablers

In his initial article about re-engineering, Hammer pleaded the case to "use the power of modern information technology to radically redesigned our business process in order to achieve dramatic improvements in their performance." [21. Hammer] Now, a decade later, any type of BPR or change management exercise cannot be attempted without utilising the benefits of IT. Ironically, the opposite problem is being experienced. IT tools are often seen as "miracle solutions" that will fix all process problems, and the less known about the application, the better miracle it is. Until process owners realise what the systems actually do, then more resistance against re-engineering amounts in form of complaints about additional work the system will cause.

IT systems such as ERP, Finite Capacity Scheduling, Supply Chain and Manufacturing Process Control, or BI systems are not miracle workers. When implemented it relates more to Welch's police leverage of the revolution, than the problem solving miracles. For a system to be used as proper support to a process or strategy, workflow management must effectively be designed into the equation. Workflow can be described as the flow of information and Control in a business process. Consequently Workflow management is the efficient management of this flow of information and control in a company's business processes. [42. GFI] Figure 7-1 indicates workflow triggering in a Goods Receive process where an ERP system is used to optimise decision making. Thus the ideal is to design processes with knowledge of the intended application to be used in mind, and indicate system interaction on process designs as workflow triggers that serve as instigators for activity continuation. These workflow triggers can be identified through workflow analysis that define information and control hand-over or interventions in the business process.

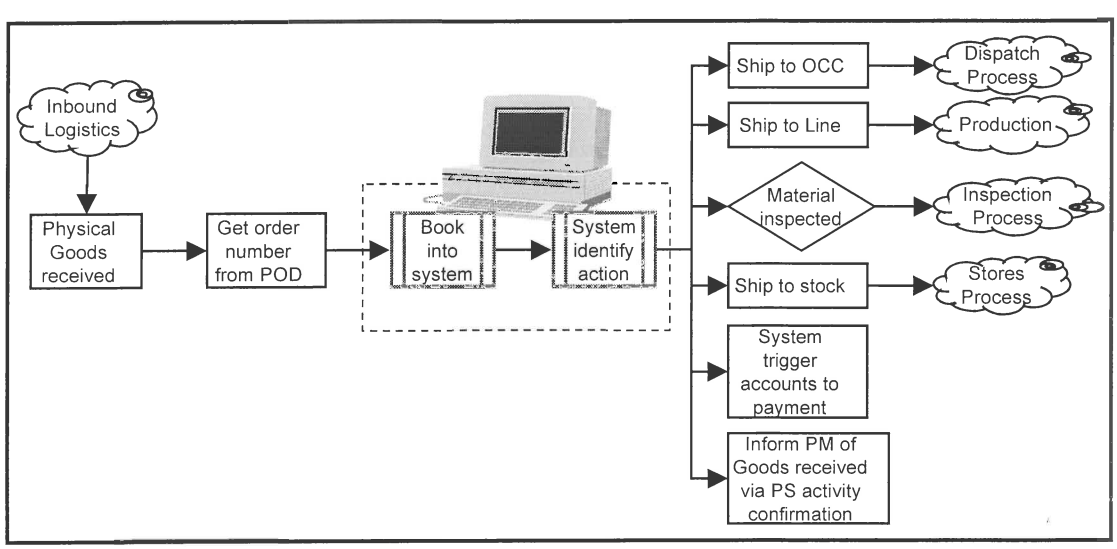


Figure 7-1 A Goods Receive process with designed in workflow triggers

Process implementation combined with application implementation can then be compared to moving down a one-way road. Once both are implemented there is no return to old ways of doing things, it is prevented by the system.

When procurement was centralised in Sietel, the ERP system provided leverage in terms of making people follow the centralised requisition release and procurement process. There were people who tried to misuse the system by trying to use it as a typewriter to printout purchase orders and procure outside the formal process. These culprits were oriented and trained in the process and proper use of the system, and if they did continued to misuse the system, their authorisation were simply taken away and they were forced to make use of procurement experts.

Another example of IT enablers that provides similar implementation persuasion are Business Intelligence systems that provide the ability to report critical corporate data efficiently and in real time. Based on online analytical processing (OLAP) and data warehousing, interactive reports provide selective chunks of information to decision-makers. These status reports are especially effective for KPI reporting, business performance measurement reporting and scorecard keeping. [40. Cognos]

7.7 Implementation Drivers Conclusion

Implementation of new processes and philosophies is not easy. It takes a lot of energy and time. The total BPR project at Sietel took 19 months, from onboarding of the first project team members until final hand over to the process owners. Nine months were spend on As-Is analysis, Should-Be modelling, creating Aspirational models, and To-Be process design phases. Ten months were spent on implementation.

This chapter reviews a few implementation strategies that was all based on critical success factors for successful implementation of either re-engineered processes or management philosophies such as the Balanced Scorecard. It suggest that successful re-engineering implementation depends on five critical success actions, or implementation drivers. Application of sufficient skill and energy to these drivers will determine BPR success:

1. **Assign appropriate ownership to re-engineered processes.**
   - At top management level.
   - At middle management level.
   - At operator level.
2. **Campaign the objectives and later the results from re-engineering.**
   - Utilise various means of communication.
   - Request employees to validate processes.
   - Involve all relevant role-players in workshops.
   - Train process owners in the new processes and philosophies.

3. **Plan and resource the implementation properly and manage it as a business project**

   - Plan implementation to start off with the *one* right action.
   - Use Best Practice causes to focus attention during implementation.
   - Run pilots to learn valuable lessons and reduce risks.
   - Ensure sufficient resource availability for implementation.

4. **Measure Key Performance Indicators regularly and make the results visible.**

   - Design process KPI's to reflect process improvement.
   - Use KPI's to measure EVA benefit of process improvement.
   - Link process KPI's to the Balanced Scorecard.

5. **Utilise Information Technology tools as enablers for the new processes.**

   - Know the IT application to be used and design its interaction as workflow triggers into the new process.
   - Concurrent process and application implementation take the organisation down a one-way path that prevents reverting back to old ways of doing things.

Instead of heading to lists of "Do this" and "Don't that" rules, and hope that the new process or philosophy will work, rather focus on making use of implementation drivers and know that the re-engineering result will be positive.

8 Business Architectures

8.1 Business Architectures Introduction

The use of architectures can be found in most disciplines where it is required to produce quality, timely results, and to manage change in complex products. These 'products' can vary in anything from buildings, aeroplanes, computer and information systems through to businesses. In the creation of these 'products', architectures facilitate two important thoughts:

- All 'products' have a life cycle;
- Depending on who is viewing the 'product', every management level requires a different perspective.

This suggest that the architecture approach have a wider scope than just a step by step recipe or method for producing 'products. For the sake of this study we will focus on the use of architectures in the design and build of businesses or enterprises, thus Business or Enterprise Architectures (BA/EA).

BA/EA has two very distinctive roots in the areas of System Development Life Cycles (SDLC) and Computer Integrated Manufacturing (CIM) systems. Zachman's framework is a classic example of a SDLC architecture that is used in BA/EA. The PERA and Grai-Gim approaches are examples of architectures from the CIM environment.

8.2 Chapter Objective

Various of these architectures, such as 'Zachman', PERA, Grai-GIM and the encompassing GERAM structure will be described in this chapter with referral to the logic and components of each. First though, a motivation for BA/EA will be looked at, in which its history is reviewed. In the conclusion the uses and future of BA/EA are postulated in terms of its role in BPR. The concluding case study chapter will look at an architecture designed and used for a Network Engineering department within Sietel.

8.3 Motivation for Business Architectures

As mentioned, BA/EA evolved from System Development Life Cycles on one root, and the Computer Integrated Manufacturing systems on the other. Zachman himself motivates the use of BA/EA with the following quote:

"I came from the information strategy community in the early days and even by the late 1960's, we were quite competent to do information strategy. Although the strategy tools and the methods have improved substantially, the analytical process was quite well understood decades ago. Our problem was, we were having grave difficulties getting from strategy ... to implementation. We knew that architecture had everything to do with bridging the gap between the strategy (expectations) and the

implementations, and with establishing an Enterprise environment that was conducive to change. The problem was, we didn't know what architecture was".

Thus SDLC required architectures to provide the cornerstone for containing Enterprise frustration and leveraging technology innovations to fulfil the expectations of a viable and dynamic Information Age Enterprise. [37. Zachman]

CIM is based on developing and organising manufacturing processes and systems so that it can be integrated and co-ordinated via computer networks. The problems with CIM systems are its complexity, expensiveness and that these systems are very hard to change. Further more, when automating, human issues are usually a problem. The objectives of CIM systems are also not properly linked to the business objectives of the company. [35. Williams et al]

These problems have resulted in the need for production systems with agility and changeability. Along with such systems, there is also a need for effective exchange of information and co-ordination of activities within companies. As a consequence various techniques and management philosophies emerged to address some of the above problems:

- Total Quality Management (TQM) and Quality Circles, which emphasised the improvement of the production processes leading to better quality products.
- Concurrent Engineering (CE) improves the product's quality and time-to-market by optimising the development process.
- Business Process Re-engineering (BPR) improves customer service and the management of the value chain, but requires drastic changes in the organisation.
- Benchmarking improves the business by comparing it to other businesses.

The concept of the BA/EA approach is a systematic application of these management and engineering methods & tools, and especially the 'way of thinking' behind these techniques, to turn an enterprise into a world class entity and to constantly evolve toward that goal.

The characteristics of a proper engineered, integrated enterprise would be [11. Bernus]:

- Information needed for decision-making, and actions taken is available when and where needed.
- There is an ability to face global competition and flourish.
- The company can shift from 'produce and sell' to 'produce what has already been sold'.
- Production is totally customer focused.
- There is an ability to easily adapt to new technology and to change the business processes.
- The mission, strategy and goals of the company are linked to the mission, strategies and goals of its internal business entities.

8.4 Types of Business Architectures

8.4.1 Zachman's Framework for Enterprise Architecture

In 1987, John Zachman published a different approach to the elements of system development. Instead of representing the process as a series of steps, he organised it around the points of view taken by the various players. These players included (1) the CEO or whoever is setting the agenda and strategy for an organisation, (2) the business people who run the organisation, (3) the systems analyst who wants to represent the business in a disciplined form, (4) the designer, who applies specific technologies to solve the problems of the business, and finally, (5) the system itself. Zachman represents each of these perspectives as a row in his matrix.

He then defined columns in the matrix to represent the kinds of things people should be looking at. These include functions and data, as addressed by most methodologies. In addition, however, Zachman has set up columns to represent locations, or where business is conducted, the people and organisations involved, events that cause things to happen, and the motivations and constraints, which determine how the business behaves. [37. Zachman]

This approach has several immediate effects on our understanding of the SDLC:

- First of all, the analysis phase typically takes on two different perspectives: one is to describe the situation in purely business terms, while the second, without yet addressing technology, describes the situation in information processing terms.
- Second, he addresses more than data and functions. He establishes a matrix that encompasses, for each phase, data, function, location, people, time, and motivation.
- Third, he doesn't call them "phases" or "steps." Each row in his matrix represents the perspective of one of the set of players in the development process. It is more important, he asserts, to recognise that systems are developed by distinct groups with different points of view, than to see the movement of systems from one step to another.
- Finally, he does not address either documentation or transition explicitly. The matrix itself provides an organisation for system documentation. And transition is the process of moving from the "as is" matrix to the "to be" matrix.

John Zachman's "Framework" is diagrammed in Table 8-1. The rows represent the points of view of different players in the systems development process, while columns represent different aspects of the process. [37. Zachman] The players are:

1. ***Outside observer (scope):*** Definition of the enterprise's direction and business purpose. This is necessary to establish the context for any system development effort.
2. ***Owner (Models of the business):*** This defines — in business terms — the nature of the business, including its structure, functions, organisation, and so forth.

3. ***Architect (Models of the business system):*** This defines the business described in step 2, but in more rigorous terms. Where row two described business functions, for example, as perceived by the people performing them, row three might describe them specifically as transformations of data. Where row two described all the things of interest to the enterprise, row three describes those things about which the organisation wishes to collect and maintain information, and begins to describe that information.

4. ***Designer (Technology models):*** These describe how technology might be used to address the needs identified in the previous rows. Here, for example, relational databases might be chosen over network ones (or vice versa), kinds of languages could be selected and program structures defined, user interfaces might be described, and so forth.

5. ***Builder (Detailed representations):*** Here a particular language is chosen, and the program listings, database specifications, networks, and so forth are all produced.

6. ***User (Functioning system):*** Finally, a system is implemented and made part of an organisation.

	Data (What)	**Function (How)**	**Network (Where)**	**People (Who)**	**Time (When)**	**Motivation (Why)**
Objectives / Scope	List of things important to the enterprise	List of processes the enterprise performs	List of locations where the enterprise operates	List of organisational units	List of business events / cycles	List of business goals / strategies
Model of the Business	Entity relationship diagram (including m:m, n-ary, attributed relationships)	Business process model (physical data flow diagram)	Logistics network (nodes and links)	Organisation chart, with roles; skill sets; security issues.	Business master schedule	Business plan
Model of the Information System	Data model (converged entities, fully normalised)	Essential Data flow diagram; application architecture	Distributed system architecture	Human interface architecture (roles, data, access)	Dependency diagram, entity life history (process structure)	Business rule model
Technology Model	Data architecture (tables and columns); map to legacy data	System design: structure chart, pseudo-code	System architecture (hardware, software types)	User interface (how the system will behave); security design	"Control flow" diagram (control structure)	Business rule design
Detailed Represen-tation	Data design (denormalize d), physical storage design	Detailed Program Design	Network architecture	Screens, security architecture (who can see what?)	Timing definitions	Rule specification in program logic
Functioning system	Converted data	Executable programs	Communica-tions facilities	Trained people	Business events	Enforced rules

Table 8-1: The Zachman Framework [37. Zachman]

The columns in the Zachman framework represent different areas of interest for each perspective. The columns describe the dimensions of the systems development effort. These are:

8.4.1.1 The Data (What) Column:

Each of the rows in this column address understanding of and dealing with an enterprise's data.

1. ***Row One*** - A list of the things that concern the company and affect its direction and purpose.
2. ***Row Two*** - A contiguous model of the things seen by the participants in the business. Many-to-many and n-ary relationships may be present, reflecting the way the business views them. Also, relationships may be shown which themselves have attributes.
3. ***Row Three*** - An information-based perspective, resolving many-to-many and n-ary relationships, along with relationships containing their own attributes. Indeed, attributes are more exhaustively defined, and unique identifiers are specified. Entities are generalised to more closely reflect the underlying structure of the business and its relationships.
4. ***Row Four*** - Entities are converted to table definitions, object classes, hierarchy segments, or whatever is appropriate for the kind of data base management system to be used. This is tantamount to creating the data definition language statements.
5. ***Row Five*** - Tables are actually implemented on physical disk drives, using the underlying organisation of the database management system. This is where table spaces are defined, disk packs are allocated, and so forth.
6. ***Row Six*** - The actual database itself is created and initial data are converted and loaded

8.4.1.2 The Function (How) Column:

The rows in the function column describe the process of translating the mission of the enterprise into successively more detailed definitions of its operations.

1. ***Row One*** - A list of the kinds of activities the enterprise conducts.
2. ***Row Two*** - These activities, described in a contiguous model.
3. ***Row Three*** - Activities portrayed in terms of data transforming processes, described exclusively in terms of the conversion of input data into output data.
4. ***Row Four*** - The technology model converts these data conversion processes into the definition of program modules and how they interact with each other. Pseudo-code is produced here.
5. ***Row five*** - The program modules are converted into source and object code.
6. ***Row six*** - Code is linked and converted to executable programs.

8.4.1.3 The Network (Where) Column:

This column is concerned with the geographical distribution of the enterprise's activities.

1. ***Row One*** - A listing of the places where the enterprise does business.
2. ***Row Two*** - Here we have a more detailed communications chart, describing how the various locations interact with each other.
3. ***Row Three*** - The architecture for data distribution, itemising what information is created where and where it is to be used.
4. ***Row Four*** - This distribution is translated into the kinds of computer facilities that are required in each location.
5. ***Row Five*** -The facilities requirements are translated into specification of particular computers, protocols, communications facilities, and the like.
6. ***Row six*** - Describes the implemented communications facilities.

8.4.1.4 The People (Who) Column:

The fourth column describes who is involved in the business and in the introduction of new technology.

1. ***Row One*** - A simple list of the organisational units and each unit's mission.
2. ***Row Two*** - This list is fleshed out into a full organisation chart, linked to the function column. Here also, requirements for security are described in general terms.
3. ***Row Three*** - The potential interaction between people and technology begins to be specified here, specifically in terms of whom needs what information to do his job. What roles do each play and what data are necessary for those roles? Along with this are specific definitions of security requirements, in terms of who (which role) is *permitted* access to what.
4. ***Row Four*** - The actual interface between each person and the technology is designed here. In this row, issues of interface graphics, navigation paths, security rules and presentation style are addressed.
5. ***Row Five*** - The design is converted into the outward appearance of each program, as well as the definitions of access permissions in terms of specific tables and/or columns each user can have access to.
6. ***Row Six*** - Trained people use the new system.

8.4.1.5 The Time (When) Column:

The fifth column describes the effects of time on the enterprise. It is difficult to describe or address this column in isolation from the others, especially column two.

1. ***Row One*** - A description of the business cycle and overall business events.
2. ***Row Two*** - This row of the time column defines when functions are to happen and under what circumstances.
3. ***Row three*** - The business events that cause specific data transformations and entity state changes to take place.
4. ***Row Four*** - Events become program triggers and messages, and the information processing responses are designed in detail.
5. ***Row Five*** - Designs become part of specific programs.
6. ***Row Six*** - Business events are correctly responded to by the system.

8.4.1.6 The Motivation (Why) Column:

As Zachman originally described this column, it concerned the translation of business goals and strategies into specific ends and means. This can be expanded to include the entire set of constraints that apply to an enterprise's efforts.

1. ***Row One*** - The enterprise identifies its goals and strategies in general, common language terms.
2. ***Row Two*** - The goals and strategies are translated into the specific rules and constraints that apply to an enterprise's operation.
3. ***Row Three*** - Business rules are expressed in terms of information that is and is not permitted to exist. This includes constraints on the creation of rows in a database as well as on the updating of specific values.
4. ***Row four*** - The business rules are converted to program design elements.
5. ***Row five*** - The business rules become specific programs.
6. ***Row Six*** - Business rules are enforced.

8.4.1.7 Application of Zachman's Framework.

What does it mean to view the development process in these terms? In some cases the Zachman framework provides more insight and greater detail than other methods, although in other cases, some important information is lost. Overall this framework acts as a comprehensive checklist to follow

during BA/EA design and implementation. The most critical issue is the amount of detail, or depth into which this framework must be taken.

In his book: 'Enterprise Architecture Planning', Spewak restricts the scope of planning BA/EA only two the first 2 rows of the Zachman framework, namely the Outside observer's view and the Owner's view. [9. Spewak] His opinion is that from the third layer onwards the Zachman framework starts with the designing of systems specifications for enterprises, which starts to become too much detail for normal BA/EA understanding. The case study in the final chapter do go beyond the planning layer of the Network Engineering department as an enterprise, but only in some areas, such as Data, Functions and People, and only to support operational understanding of the enterprise.

8.4.2 The PERA model for Enterprise Architectures

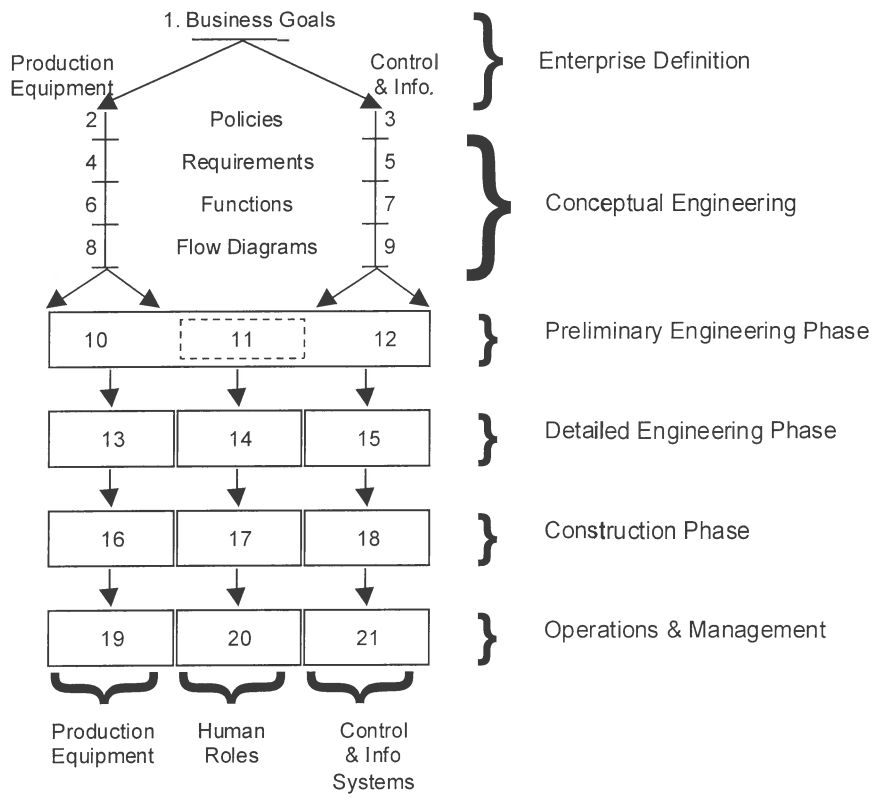
The Purdue Enterprise Reference Architecture (PERA) was developed by the Purdue University. The Purdue Reference Architecture's development started in 1986 and evolved from Applied Industrial Control studies done by the Purdue Laboratories before this time. This Reference Architecture demonstrates in great detail the life-cycle diagram of an enterprise, and explains the phases and layers of a BA/EA project or exercise. [36. Williams]

In the Purdue Enterprise Reference Architecture (PERA), the basic building blocks are synthesised into the main functions of Production, and Control & Information. Human roles are then integrated in between these two main functions. Thus this BA/EA not only depicts perspectives on the three elements of production, human roles and Control & Information, but also demonstrates how these elements integrate on the various levels / life cycle phases. PERA describes the whole life cycle of how an organisation would be designed, build and integrated. See figure 8-1 for an illustration of this life cycle with descriptions of each block making up the life-cycle model. This life cycle mainly consists of the following steps:

- Enterprise definition;
- Enterprise concept identification;
- Specification and design of the organisation (this is done in a preliminary and detail engineering phases);
- Construction phase;
- and finally organisation operation.

From these steps, it can be seen that there is a correlation between the design and build life cycle of an organisation, and the development and production of a new product. Organisationally seen it follows a top-down approach in identifying its elements.

The PERA Enterprise Life-Cycle Model



1. Definition of Business Entities, Mission, Goals, ect		
2. Production Policies - e.g. Distributed Manufacturing	3. Info Policies - e.g. Corp. Network Standard	
4. Production Requirements - e.g. OSHA, Underwriters	5. Info Requirements - e.g. Maintenance Mgt System	
6. Production Functions - e.g. Generic Unit Operations	7. Info Functions - e.g. Work Order Tracing	
8. Process Diagrams - e.g. PFD, Mat. Flow Balance	9. Info Diagrams - e.g. Dataflow, Systems Arch	
10. Functional Design of Production Equipment - e.g. P&IDs Plant Layouts	11. Functional Design of Human Roles & Organisation - e.g. Org chart, Staff levels	12. Functional Design of Control & Info Systems - e.g. Entity Rel. Dgms, ISA Logic
13. Detail Design of Production Equipment - e.g. Piping & Conduit Drawings	14. Detail Design of Tasks, Training Plan - e.g. Operation & Maint Manuals	15. Detail Design of Hardware & Software - e.g. Configuration, Programming
16. Construct, Checkout & Commission Production Equip. e.g. Machinery Install & Test	17. Staffing, Training, Checkout Plant procedures e.g. Simulator Training	18. Assembly, Test & Commiss. Control & Info Systems -e.g. DCS Checkout, Program Test
19. Production e.g. Debottlenecking, Cost & Quality Improvement	20. Operate & Maintain - e.g. Ongoing Training, Performance Improvement	21. Operation of Info & Control Systems - e.g. Maintenance Debug & Upgrade

Figure 8-1 The PERA life-cycle model [36. Willimas]

8.4.2.1 Descriptions of each block making up the PERA model.

1. The **Business Goals** describe the vision, mission and values of the company as expressed from company annual reports.
2. Operational strategies relate into **Production Policies**, examples being scope of activities for development and operation of specific processes and plants.
3. **Information & Control Policies** relate to topics such as: control capabilities, performance of processes, adherence to classes of regulations and laws, quality, productivity and economic return.
4. **Requirements for production of products or services** to be generated by the company for specific processes and process plants – general safety requirements, fire rules, ect.
5. **Requirements for the implementation of Information Architectures** to carry out operational policies of the company.
6. Sets of **production tasks and function modules** required to carry out the production or service processes.
7. Sets of **control tasks and function modules** required to carry out the Information Architecture activities.
8. **Process Flow diagrams** showing the connectivity of tasks and function modules of the production processes involved.
9. **Connectivity / E-R diagrams** of tasks and function modules of the Information Architecture.
10. Functional design of **production equipment** – these would include plant layouts, production planning, and CIM systems.
11. Functional design of the **Human and Organisational** Architecture containing information such as required personnel tasks and skill levels.
12. Functional design of **Information Systems** Architecture – Detail E-R diagrams.
13. **Detail design** of components, processes, and equipment of the **Production Processes and Equipment.**
14. **Detail design** of task assignments, skills development training and organisation of the **Human Organisational Architecture.**
15. **Detail design** of the equipment and software of the **Information Systems Architecture.**

16. **Construction**, project management and commissioning of the equipment and processes in the **Production Architecture**.

17. **Implementation** of task assignments, skills development training and organisation of the **Human Organisational Architecture.**

18. **Construction**, project management and commissioning of the equipment and processes in the **Information Systems Architecture**.

19. **Production Operation** – Continued improvement of process and equipment operating conditions to increase quality and productivity.

20. Continued **organisational development**, skill and human relations development training.

21. **Operation of the Information and Control System**, including its continued improvement.

8.4.2.2 Application of PERA

The beauty of PERA is that in itself it is an architecture as well as working methodology for an organisation to follow in the creation/implementation of itself. It allows a phased approach for the implementation of its elements, while still facilitating the overall integration during the life cycle.

In the Network Engineering case study, later in this dissertation, this methodology is used for the creation of the department. During the Definition and Conceptual phases it would be required though, to thoroughly define Network Engineering's interaction with the rest of the organisation. For the sake of this case study the PERA approach will only be applied until the Detail Engineering phase for the design of the Network Engineering department.

8.4.3 The Grai-Gim model for Enterprise Architectures

The GRAI Integrated Methodology was developed by the Grai laboratory of the University of Bordeaux. This GRAI-GIM Architecture represent four co-operating systems, according to which an organisation is modelled:

- Decision system,
- Information system,
- Operating system,
- Physical system.

The integration and working of this architecture is shown in Figure 8-2. The most important difference, and contribution in the GRAI-GIM Architecture is its decision modelling technique. According to this architecture the main task of the organisation is to make decisions. The decision system is the company's brain, and to achieve an 'aware enterprise' a good decision system is needed. [11. Bernus]

The decision system congregates from decision centres. Decision centres originate in the top management structure, where strategic decision making takes place, and decompose down to operation decisions. The operational- and physical systems are utilised as tools by the decision system, to manufacture products or deliver services. The information system then acts as the feedback of operational data to the decision system. Thus a closed-loop enterprise is created.

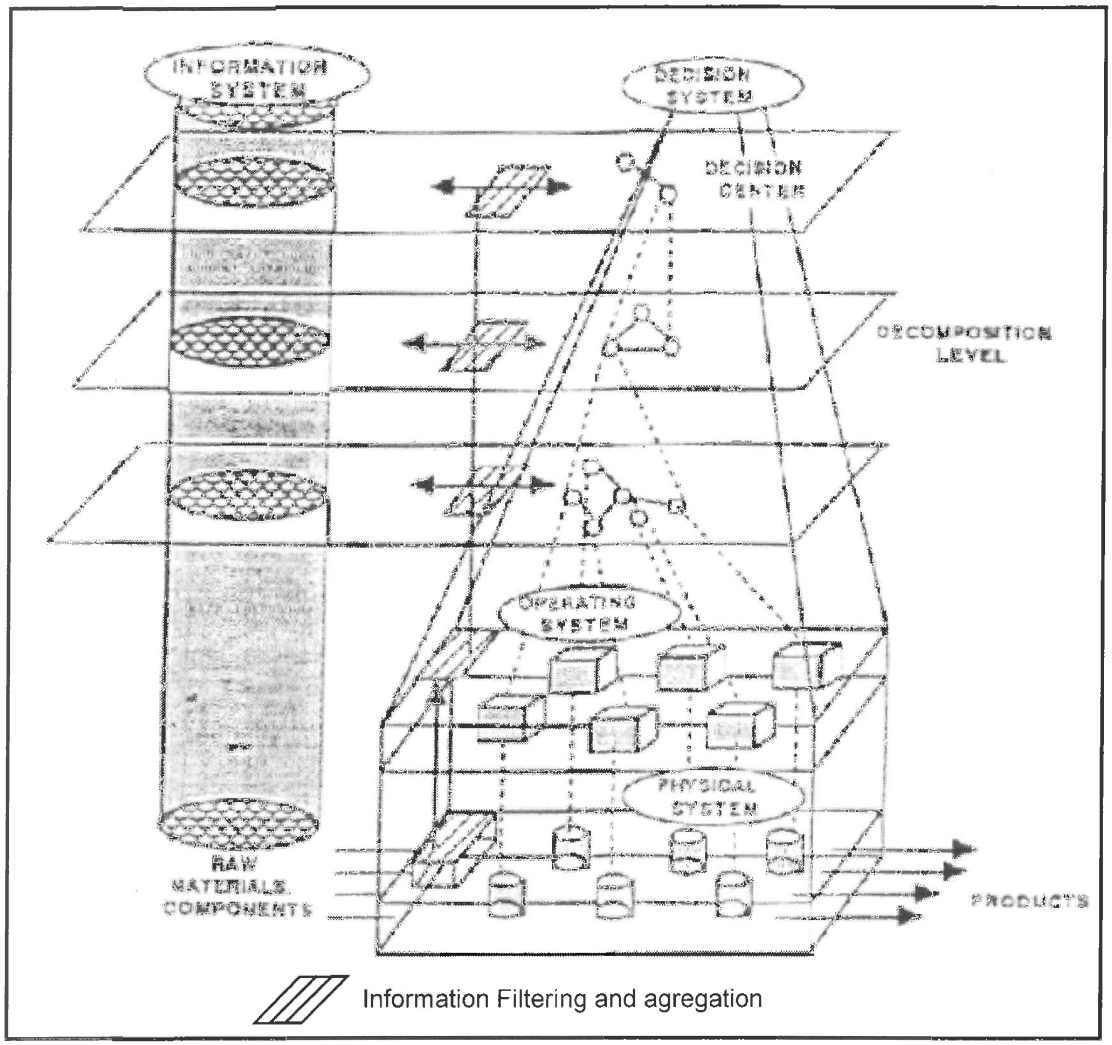


Figure 8-2 Grai Gim decision making model [11. Bernus]

Figure 8-3 shows the structured procedure of Enterprise Design according to GRAI-GIM. As can be seen the analysis and design is being done in terms of the four co-operating systems.

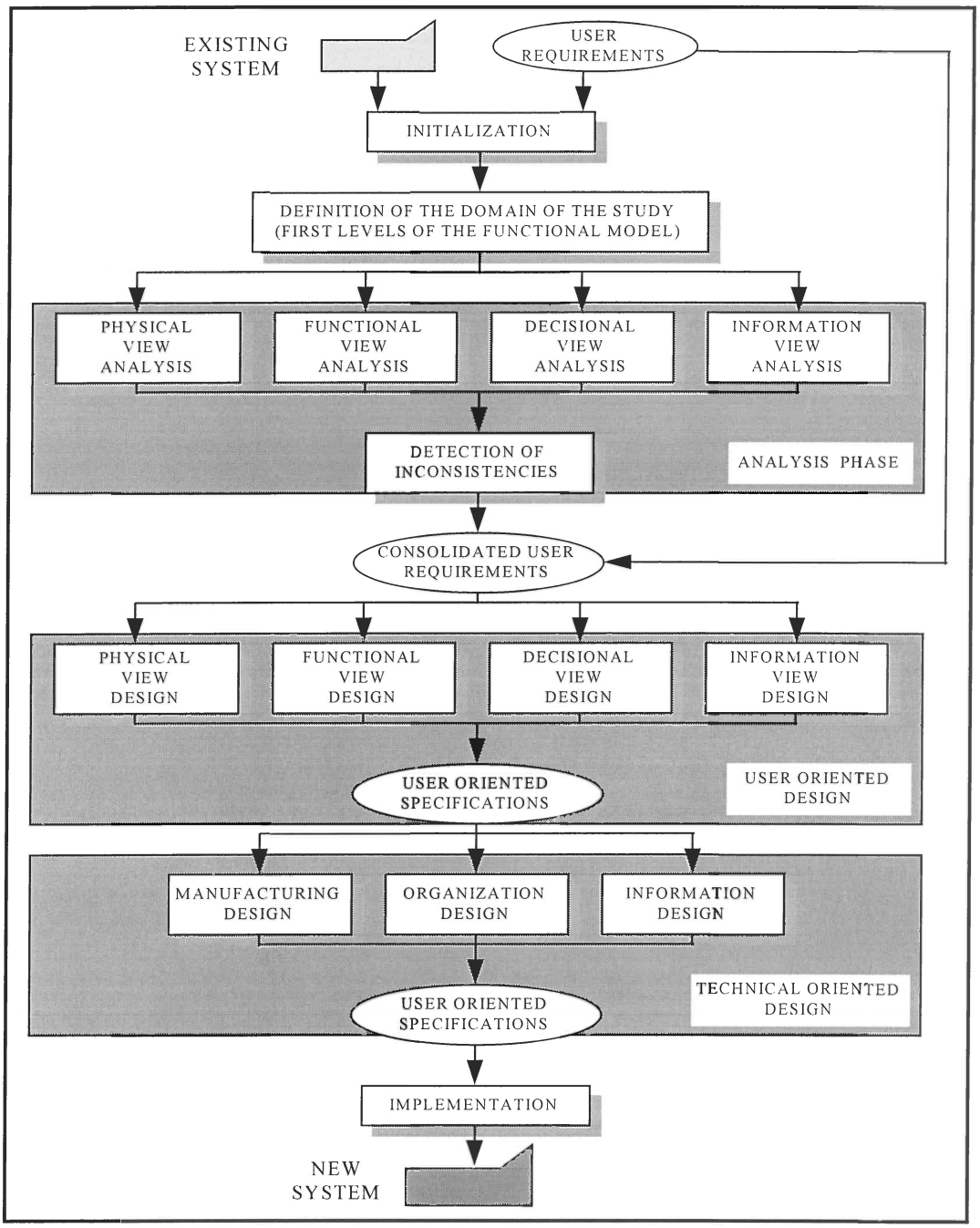


Figure 8-3 Grai-GIM Enterprise life cycle [11. Bernus]

8.4.3.1 3.3.2. GRAI-GIM Enterprise Functioning

To help identify the decision centres needed for the functioning of a production enterprise, a Grai-Grid can be used to classify the areas of management activity. Both the management and production activities can be then modelled to an IDEF0 rough diagram. An example is shown in Figure 8-4 and Figure 8-5.

Generic Grai-Gim grid

	External Information	Management of products (input)	Management of products (output)	Planning	Management of Resources	Internal Information
Period / Horizon driven activities	9. Receive and gather information from the outside world to support management activities, for ex. Data for market forecasting.	4.1.The assurance of incoming material and services when needed. Activities include: - Purchasing plans - Supplier contracting - MRP planning - (R&D ?)	4.2. The assurance that the product reaches the client, activities include: - Production planning - Forecasting - Marketing	7. Co-ordinate the products inputs and outputs with resource management: -High lvl: Achieving company goals -Mid lvl: Achieving sales goals - Low lvl: Customer satisfaction via scheduling.	6. Assure that there will be resources (people, capital, machines) available for production / providing services.	8. Store and supply information to any area of activity in the company. -This is usually in the form of a databases which provide management information. - (This is not application programs)
Real time activities	1. Recording of any input information: - Client orders - Supplier information	2. Purchasing operations.	3. Incoming material/services- and outgoing products control.		5. The co-ordination and control of people, capital and machines to assure production and services.	

Figure 8-4 Grai-Grid defining management functions [11. Bernus]

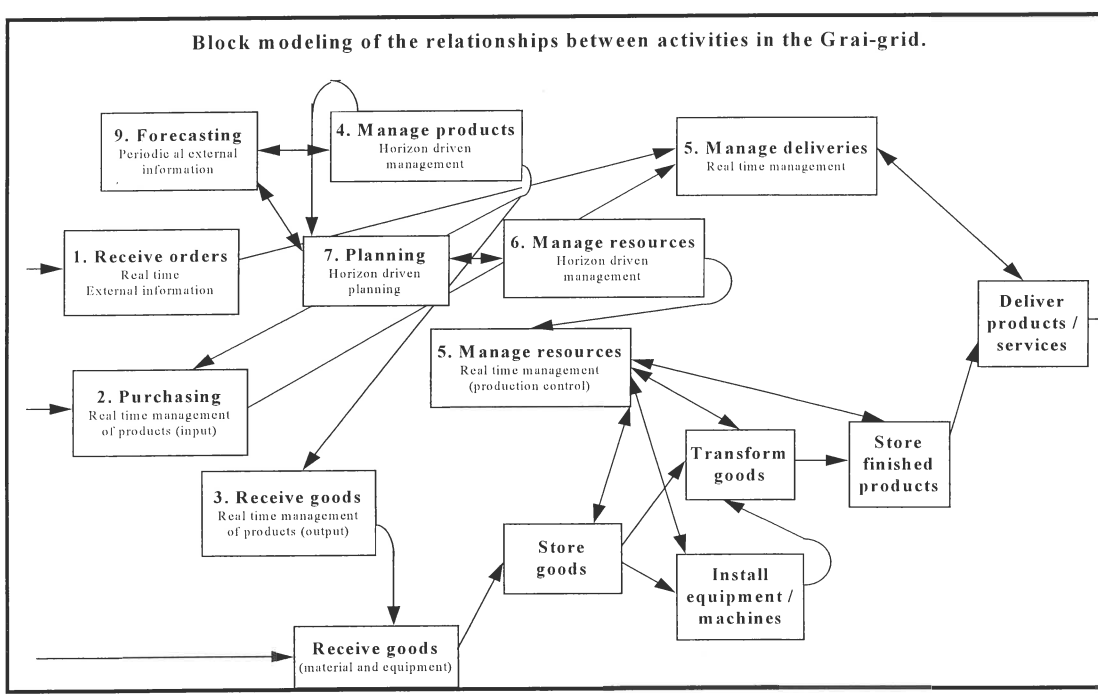


Figure 8-5 Relationships between activities in the Grai-Grid [11. Bernus,96]

8.4.3.2 Application of Grai-Gim

The Grai-Gim methodology is useful in defining a hierargy for decision making and control within an enterprise, especially in already existing organisations. Using the Grai-grid with its corresponding decision centres, would describe all the relevant decision roles in an enterprise. When a proper model of the necessary systems is build, it is easy to define the communication links between the components. This BA/EA can also be used in conjunction with the Balance Scorecard, in which a set of measurements are defined for the Balance Scorecard and the GRAI-GIM architecture is used to define the measurement and control tree down into the enterprise.

8.4.4 The GERAM envelope for Business Architectures

Due to the existence of various BA/EA's there was a need to compare and evaluate these and to combine the various methodologies and modelling techniques and to identify the missing tools. Based on the investigation of an international task force in 1995, a new Generic Enterprise Reference Architecture and Methodology (GERAM) was defined. This architecture defined a toolbox of concepts for designing and maintaining enterprises during their life cycle. The significance of GERAM is that it combines individual reference architectures and thus acts as a mediator, or common framework. [22. IFIP-IFAC]

8.4.4.1 *The structure of GERAM*

The GERAM framework can be described as an Entity-Relationship diagram shown in the following figure.

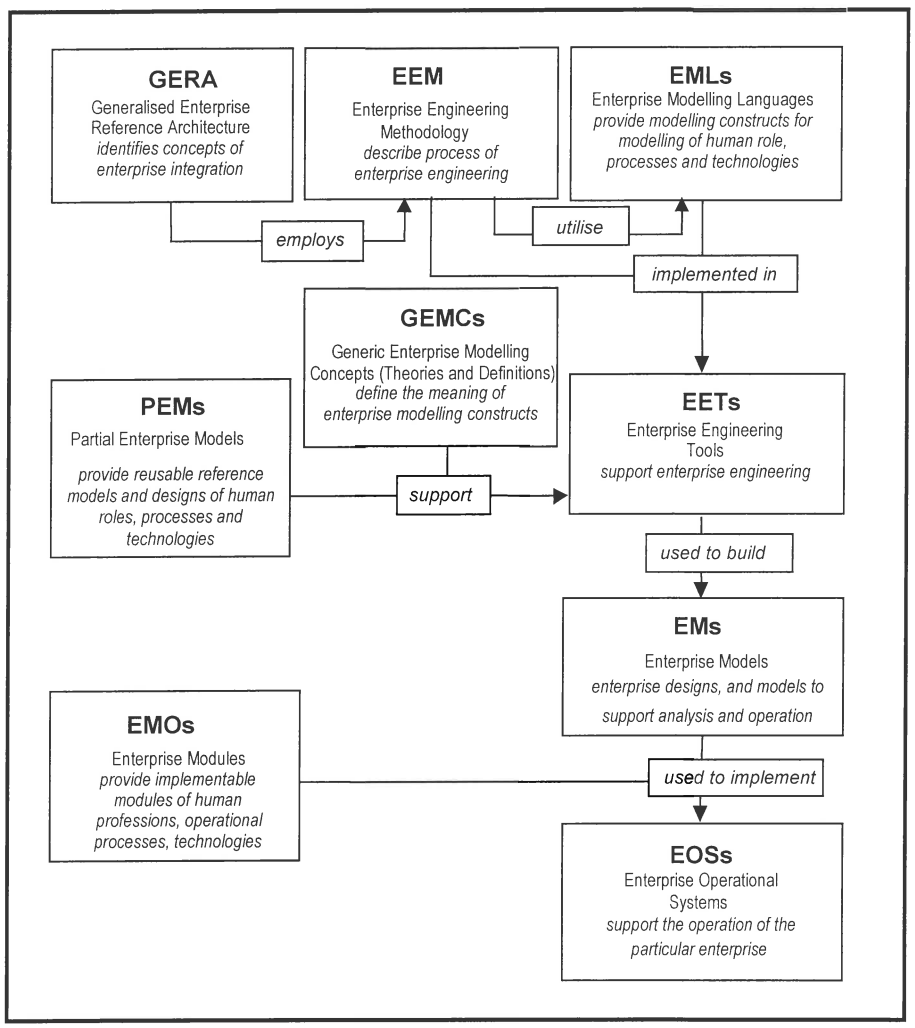


Figure 8-6 GERAM framework components [22. IFIP-IFAC]

Some of the basic components which GERAM consists of are the following [22. IFIP-IFAC]:

- **EEMs - Enterprise Engineering Methodology** - describe the processes of enterprise engineering and integration. An enterprise engineering methodology may be expressed in the form of a process model or structured procedure with detailed instructions for each enterprise engineering and integration activity.
- **EMLs - Enterprise Modelling Languages** - define the generic modelling constructs for enterprise modelling adapted to the needs of people creating and using enterprise models. In particular enterprise modelling languages will provide construct to describe and model human roles, operational processes and their functional contents as well as the supporting information, office and production technologies.

- **GEMCs - Generic Enterprise Modelling Concepts -** define and formalise the most generic concepts of enterprise modelling. Generic Enterprise modelling concepts may be defined in various ways. In increasing order of formality generic enterprise modelling concepts may be defined as:
  - Natural language explanation of the meaning of modelling concepts (glossaries);
  - Some form of meta model (e.g. entity relationship meta schema) describing the relationship among modelling concepts available in enterprise modelling languages;
  - Ontological Theories defining the meaning (semantics) of enterprise modelling languages, to improve the analytic capability of engineering tools, and through them the usefulness of enterprise models. Typically, these theories would be built inside the engineering tools.
- **PEMs - Partial Enterprise Models** (reusable-, paradigmatic-, typical models) - capture characteristics common to many enterprises within or across one or more industrial sectors. Thereby these models capitalise on previous knowledge by allowing model libraries to be developed and reused in a 'plug-and-play' manner rather than developing the models from scratch. Partial models make the modelling process more efficient. The scope of these models extends to all possible components of the enterprise, such as models of humans roles (skills and competencies of humans in enterprise operation and management), operational processes (functionality and behaviour) and technology components (service or manufacturing oriented), and infrastructure components (information technology, energy, services, etc.). Partial models may cover the whole or a part of a typical enterprise. They may concern various enterprise entities such as products, projects, or companies, and may represent these from various points of view such as data models, process models, or organisation models, to name a few. Partial enterprise models are also referred to in the literature as 'Reference Models'.
- **EETs - Enterprise Engineering Tools -** support the processes of enterprise engineering and integration by implementing an enterprise engineering methodology and supporting modelling languages. Engineering tools should provide for analysis, design and use of enterprise models.
- **EMs - (Particular) Enterprise Models -** represent the particular enterprise. Enterprise models can be expressed using enterprise-modelling languages. EMs include various designs, models prepared for analysis, executable models to support the operation of the enterprise, etc. They may consist of several models describing various aspects (or views) of the enterprise.
- **EMOs - Enterprise Modules -** are products that can be utilised in the implementation of the enterprise. Examples of enterprise modules are human resources with given skill profiles (specific professions), types of manufacturing resources, common business equipment or IT infrastructure (software and hardware) intended to support the operational use of enterprise models. Special

emphasis is placed on the IT infrastructure which will support enterprise operations as well as enterprise engineering. The services of the IT infrastructure will provide two main functions:

1. Model portability and interoperability by providing an integrating infrastructure across heterogeneous enterprise environments;
2. Model driven operational support (decision support, operation monitoring and control) by providing real-time access to the enterprise environment.

The latter functionality will be especially helpful in the engineering tasks of model update and modification. Access to real world data provides much more realistic scenarios for model validation and verification than simulation based on 'artificial' data.

- **EOSs** - (Particular) Enterprise Operational Systems - support the operation of a particular enterprise. Their implementation is guided by the particular enterprise model that provides the system specifications and identifies the enterprise modules used in the implementation of the particular enterprise system.

8.4.4.2 The life cycle approach for BA/EA.

The enterprise life cycle are all the management, engineering, construction and operation processes which are involved in the creation, use and possible decommissioning of an enterprise. In the Generic Enterprise Reference Architecture the following four life cycles are taken into consideration and each form apart of one another:

1. Strategic enterprise management, that gives the go-ahead for the enterprise.
2. The enterprise engineering project, whom is responsible for the building of the enterprise.
3. The enterprise itself.
4. The product that is produced by the enterprise.

These four life cycles fit into one another as illustrated in the figure 8-7.

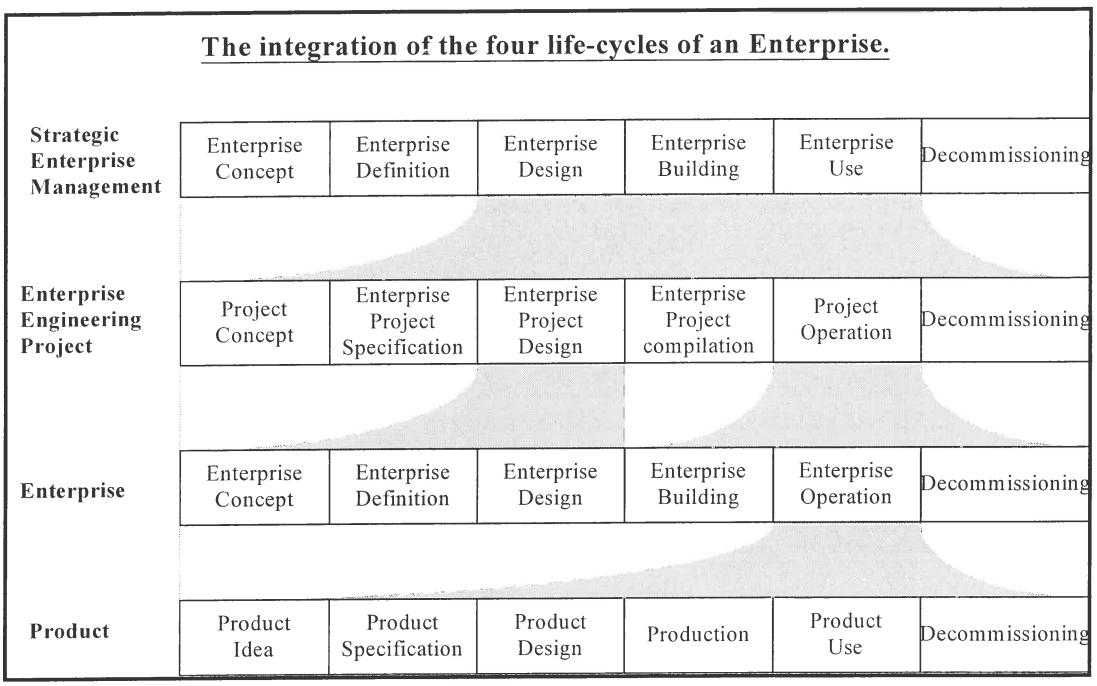


Figure 8-7 Integration of four life cycles

8.5 Business Architectures Conclusion

In the BA/EA's industry opinions are that Architectures will only come to their full right at the beginning of the new millennium. Those individuals that understand BA/EA and know how to use it, find it to be a huge advantage in the design and engineering of systems, enterprises and even businesses.

It is well accepted that the most important phase in a product's life cycle is the design phase. The more time and planning spent in this phase, the more time and cost is saved in later stages of the product life. Business life cycles work the same way. Planning and developing the business thoroughly at the start will save effort and energy in the implementation phases. BA/EA is the ideal tool for such planning and can do for organisational structuring what CAD/CAM did for product design. However, before the concept of BA/EA planning using meta-models understood and accepted, architectures will not be used to their full potential.

Another problem BA/EA encounters is that it provides more of a long-term impact than a short-term impact. The immediate fruits are not directly apparent and in the culture of quick fix methods and bottom line impacts, the value of BA/EA is still to be realised, especially as life cycles of enterprises reduce and the need for flexibility increases.

From all the examples mentioned, it can be seen that there are a couple of BA/EA meta-models already existing, and depending on the type of business to be engineered, an applicable model needs to be selected. These models are like flow diagrams with all the steps included, but some might not be necessary and can be skipped. This is helpful to ensure that all relevant aspects are considered and the

business design is as complete as possible. In a way already existing meta-models can thus be seen as a form of best practices that ensures thoroughness during BPR design phases.

As mentioned earlier, the Grai-Gim architecture is good for already existing organisations where decision centres need to be defined, or control paths for Balanced Scorecard KPI's established. But it does not provide comprehensive guidance for building new enterprises. In contrast Zachman's BA/EA is very complete regarding all aspects that need to be considered for enterprise structuring. Because it is based on a SDLC approach, it is very technical and very seldom would it be possible, or useful to define the total architecture for an enterprise. The author gives preference to PERA because of its simple life cycle approach to enterprise structuring, while providing a complete checklist of functions to be considered. In the last chapter's case study the PERA life cycle is used and combined with components from Zachman's BA/EA.

In conclusion, the biggest benefit BA/EA provides for BPR exercises are ready-made structures for capturing blue prints of re-engineered processes. The meta-models are also used as examples to give a BPR team guidance in how the processes should look in order to produce BA/EA blue prints. At later stages, after the completion of the BPR exercise, these blue prints can be used for similar exercises in other business units as meta-models, or to facilitate understanding in ISO procedures.

9 Concluding Case Study Chapter

9.1 Concluding Chapter Introduction

This dissertation systematically examined seven critical elements of Business Process Re-engineering, each time from a different perspective. It started with financial and executive management's perspectives on the need for BPR and how to align its objectives with the strategy of the organisation. The core chapters examined re-engineering methods, tools, best practices and project management techniques for BPR projects, as utilised by BPR practitioners and teams. The implementation chapter provided insights in critical success factors for BPR. These implementation drivers are of importance to process owners who have to ensure the sustainability of re-engineered processes. The final chapter returned to an Industrial Engineering academic orientated focus, proposing generic meta-models to capture knowledge from these elements into reusable structures.

Because the approach was a broad scope analysis of involvement required for BPR, instead of detail, narrow focussed studies, this dissertation also facilitates practical examples. The case study in this chapter is such an example that will illustrate most of the elements discussed.

9.2 Chapter Objective

As stated in the introduction, although all elements are interlinked, each can also be utilised separately, or 'plug-and-played' into a workable solution for any type of BPR project. The objective of this concluding case study chapter is to demonstrate how various BPR elements were incorporated into a Business / Enterprise Architecture (BA/EA) for designing and implementing a Network Engineering (NE) department in Sietel.

9.3 Business Architecture case study of Network Engineering

9.3.1 Background

The South African telecommunication market undergone some major changes due to the deregulation of communication services. This had a huge impact on Sietel, which was one of the big suppliers for telecommunication equipment. Except for the need to re-engineer its organisation, Sietel also had to re-align its strategy towards the changed market. The Market no longer required just delivery of telecommunication equipment, but also expected a wide range of specialist services to be included. From a strategic point of view, Sietel refocused its vision in order to pursue a niche market of providing unique telecommunication solutions through its products and services. In line with this strategy, the ability to provide such specialist services had to be ensured, which created the need for a Network Engineering (NE) function.

Such a NE function had to be able of dimensioning telecommunication networks, from the amount of switching systems needed down to the number of nuts and bolts required. For example: a customer

could require a cellular network for an average of 50 000 subscribers in a densely populated area over a region of 2500 square kilometres. A NE function then has to dimension the network in terms of: how many base stations will be needed, where each will be located, the type of switching systems required, which other networks it needs to access and finally detail BOMs required for each component. This service has to be provided in addition to the delivery of telecommunication equipment, its installation and commissioning.

Sietel decided to pursue this opportunity and had to formally create a Network Engineering department, due to the fact that this type of functionality only existed partly within the organisation.

9.3.2 Using Business Architecture as basis for approach

The BA/EA approach was utilised in the structuring of the NE department. The motivation to use BA/EA was to ensure the NE function was engineered correctly and thoroughly, avoiding critical elements being forgotten that can lead to a bad quality service. The requirement was to do a detail design of the NE department in co-ordination with the future function owners. The physical implementation and operation of this department, or 'enterprise', were left to the process owners.

This approach of enterprise engineering relates to defining the top three rows of the Zachman Framework for the NE enterprise, or implementing PERA up to detail design level. Thus the combination of these two BA/EAs were used as the basis for structuring the NE function. As result the following checklist of enterprise engineering activities were performed to create a BA/EA for NE:

1. NE **Enterprise Definition**, which requires defining:
   - The NE mission in relation to the Sietel vision,
   - The motivation for the NE department,
   - The list of Goals for the NE department.

   These components correlate with the *Enterprise Definition* phase of PERA and the first row of the Zachman framework identifying the *Motivation*. Strategy deployment techniques were used to define these components of the NE architecture.

2. **Conceptual Engineering** of the NE enterprise, required the definition of:
   - List of services provided by NE,
   - Activities, or functions performed by NE,
   - The list of organisational units in NE,
   - A Business Case for NE.

These components correlate with the *Conceptual Engineering* phase of PERA and the first rows of *Data, Function, and People* on the Zachman framework as well as *Motivation* – row two. Concepts from BPR 'Could-Be' modelling and identification of EVA opportunities were used for this part of the NE architecture.

3. **Preliminary Engineering** of the NE enterprise required defining the following processes and structures:

   - Relationship diagrams indicating NE integration in the organisation / business,
   - Supply Chain process flows indicating NE interaction in the business schedule,
   - Business processes for NE,
   - The Matrix organisational structure required for NE and job descriptions.

   These components correlate with *Preliminary Engineering* phase from PERA and defining *row two* for the Zachman framework. Applying BPR techniques and Best Practice concepts were most useful for these enterprise engineering activities.

4. **Detailed Engineering** of the NE enterprise, which consisted of the following components:

   - A data model & data flow indicating applications used by NE,
   - RACI charts indicating NE's Roles & Responsibilities,
   - Detail task and workflow descriptions for NE,
   - Key Performance Indicators for NE linked to their Dashboard.

Defining of these aspects would correlate with the *Detail Engineering* phase of PERA and row three for *Data, Function, People and Motivation* on the Zachman framework. Strategy deployment and BPR tools were used for this detail part of the NE architecture.

In figure 9-1 it can exactly be seen which of the Zachman Business Architecture components were relevant to describing the Network Engineering department.

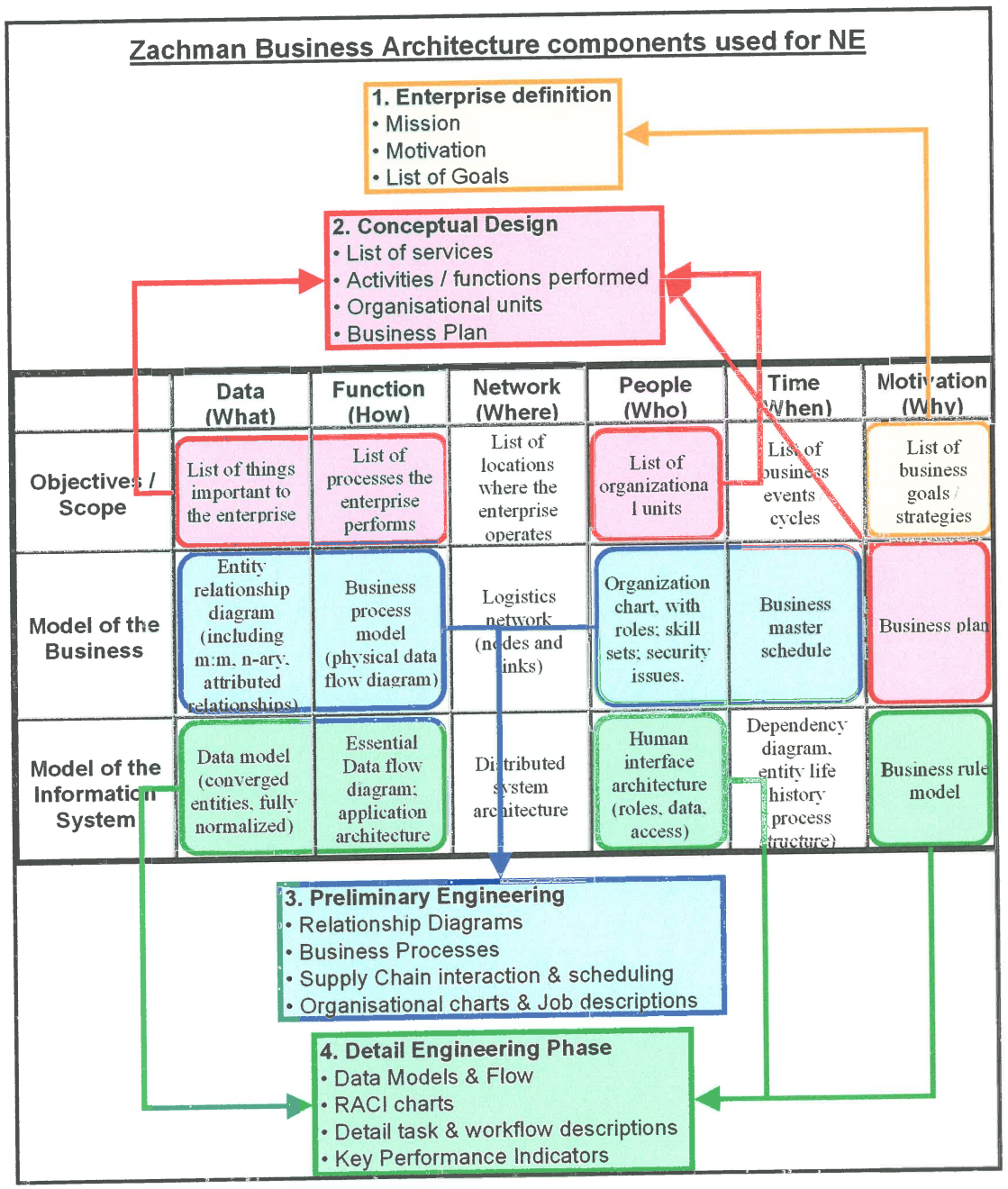


Figure 9-1 Applicable components from Zachman Framework for NE

9.3.3 The Network Engineering department Architecture

9.3.3.1 NE enterprise definition.

The BA/EA approach is to start-off by defining NE in concept from a high level perspective. This is done most effectively by linking NE's enterprise definition to the organisation's strategy. By means of strategy deployment the motivation and goals of NE can also be described.

9.3.3.1.1 NE mission in relation to the Sietel vision

The Sietel vision:

Our vision is to be the
most successful telecommunications solutions provider
in Southern Africa...

Directly related to this vision, NE's mission is:

Enable Sietel to remain a
world class telecommunications solutions provider
by supplying an expert Network Engineering service
to internal and external customers.

This mission were used for the NE strategy, from which a motivation and a list of strategy goals were deducted.

9.3.3.1.2 The motivation for the NE department

In order to pursue the opportunity of providing telecommunication solutions, the following discrepancies were found in Sietel, which proved as motivation for the NE function:

- Most components of Network Engineering are present in the organisation but are not fully developed and are scattered throughout the organisation.
- This leads to inefficient network design and control over the design of the customer networks.
- There is nobody that has technical accountability for the functionality as a whole.
- The tools used in the organisation are not compatible and every part of the network is stored in a different system.
- There is little control over tools for different network components.

By introducing the NE function, and centralising all network design activities to this function, these discrepancies would be addressed.

9.3.3.1.3 The list of Strategy Goals for the NE department

In reply to the motivation for NE, the following goals were established:

- To provide our customer with total solutions for his business.
- To provide the competence and know how in order to ensure the successful implementation and operation of telecommunications networks.
- To develop the competence in Sietel and promote the sales of this service through the Key Accounts.

9.3.3.2 Conceptual design of the NE enterprise.

Utilising BPR aspirational modelling were the most appropriate to design NE in concept. It required NE's services, functions and structure to be defined in a simple and ideal way. In addition a holistic business case had to be drawn-up to indicate the financial relevance of the enterprise. Identification of EVA opportunities was applicable for this purpose.

9.3.3.2.1 List of Services provided by NE.

To provide 'total telecommunication solutions', NE has to perform the following services:

- **Network analysis** of customer requirements for tendering purposes.
- **Conceptual design** of networks in conjunction with the Technical Sales department.
- **Rough cut dimensioning** of networks and produce BOM's for quotation purposes.
- **Consult** Key Accounts during contract negotiation on best possible solutions.
- **Detail analysis** of customer equipment requirements once an order is placed.
- **Detail design** of networks and produce of detail BOMs with material master lists.

All these services have to be produced for the following technologies:

- Mobile Networks based on GSM-type switching technology.
- Fixed (wire-line) Networks based on PSTN-type switching technology.
- Transmission and Broadband Networks utilising high-bandwidth technology to carry high volumes of data.
- Radio Networks based on technology to enable wireless communication.

The services provided by NE can be demonstrated in the following value chain:

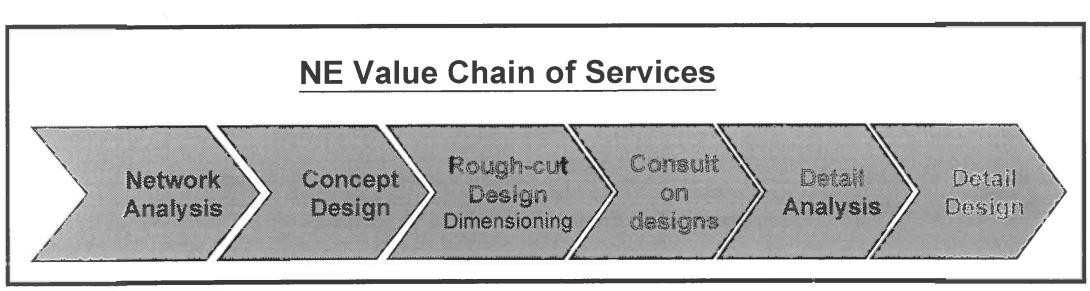


Figure 9-2 Services provided by NE

9.3.3.2.2 Activities / Functions performed by NE

The following were high level descriptions of actions and functions NE had to perform through out its value chain of services it provided:

- Sales Support through:
  - Supporting of the Sales department during the tender phase.
  - Product and feature descriptions.
  - Conceptual design and dimensioning for pricing purposes.
- Network design:
  - System specifications and feature descriptions.
  - Design of the network system and interfacing of different systems and technologies.
  - Plan network infrastructure requirements, taking buildings, roads, geography, etc. into consideration.
  - Specification of system changes.
- Detail design
  - Co-ordinate detail design by different systems experts.
  - Ensure Inter-working and compliance to specifications and requirements of the customer.
- System integration.
  - Specification of interfacing, protocols, etc. for integration of new systems.
  - Approval of designs, test procedures, verification of acceptance testing.
- Network Quality Management
  - Interpretation of network operational data and system improvement proposals to customers.
  - Ensuring that the quality of the system is within the requirements specified.
- Customer Processes
  - Development of the business processes for the customer to operate his system.
  - User documentation and operating instructions.
  - After Sales logistics - spares, back-ups, maintenance recommendations.

9.3.3.2.3 The list of organisational units in NE.

In order to provide network solution services over all types of technology, NE had to structure itself into the following sub-departments:

- A Mobile Networks department to engineer GSM-type switching networks.
- A Fixed Networks department to engineer wire line PSTN-type switching networks.
- A Transmission Networks department to engineer broadband links for networks.
- A Radio Networks department to engineer wireless communication networks.

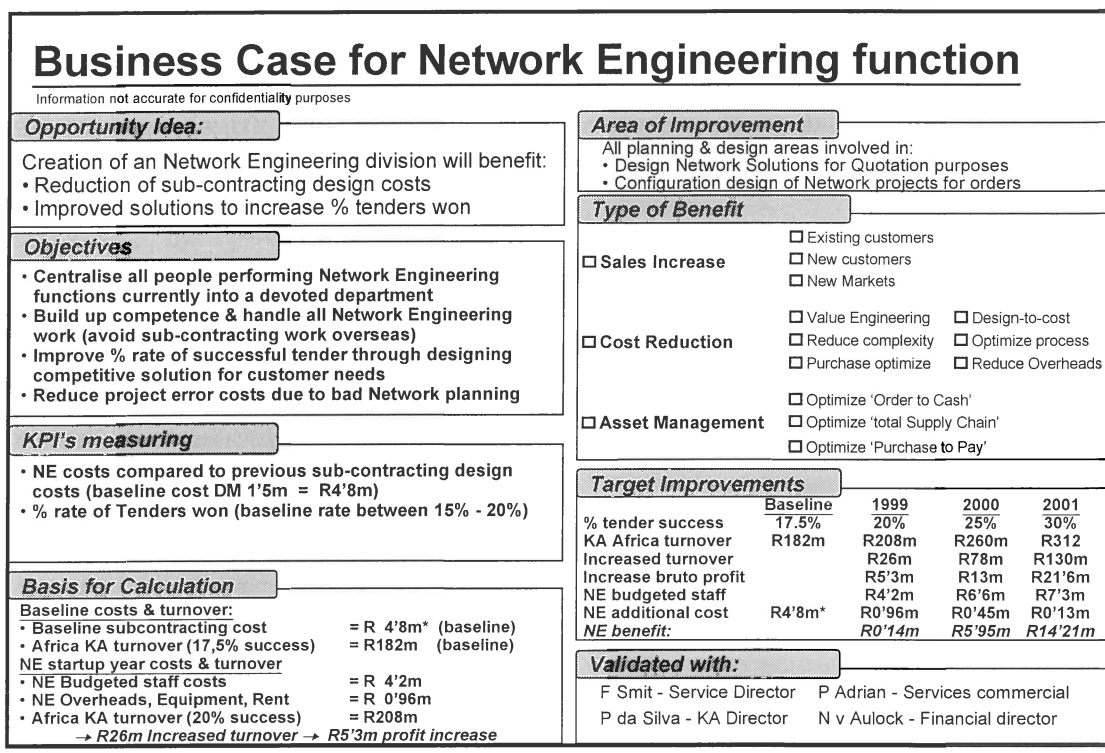
- A group of project specific Network Engineers to perform co-ordination activities between various technologies.

9.3.3.2.4 NE Business Case

A business case for this new enterprise had to be drawn-up based on EVA opportunities that would be realised from creating the NE function. The types of opportunities that would result were:

- Sales Increase resulting from an increase in the percentage tenders won due to better service offerings through the NE function.
- Cost Reduction of sub-contractor costs on outsourced design work.

The lay-out of the total business case is presented in Figure 9-3.



Business Case for Network Engineering function

Information not accurate for confidentiality purposes

Opportunity Idea:

Creation of an Network Engineering division will benefit:
- Reduction of sub-contracting design costs
- Improved solutions to increase % tenders won

Objectives

- **Centralise all people performing Network Engineering functions currently into a devoted department**
- **Build up competence & handle all Network Engineering work (avoid sub-contracting work overseas)**
- **Improve % rate of successful tender through designing competitive solution for customer needs**
- **Reduce project error costs due to bad Network planning**

KPI's measuring

- **NE costs compared to previous sub-contracting design costs (baseline cost DM 1'5m = R4'8m)**
- **% rate of Tenders won (baseline rate between 15% - 20%)**

Basis for Calculation

Baseline costs & turnover:
- Baseline subcontracting cost = R 4'8m* (baseline)
- Africa KA turnover (17,5% success) = R182m (baseline)

NE startup year costs & turnover
- NE Budgeted staff costs = R 4'2m
- NE Overheads, Equipment, Rent = R 0'96m
- Africa KA turnover (20% success) = R208m

→ *R26m Increased turnover → R5'3m profit increase*

Area of Improvement

All planning & design areas involved in:
- Design Network Solutions for Quotation purposes
- Configuration design of Network projects for orders

Type of Benefit

☐ Sales Increase	☐ Existing customers	
	☐ New customers	
	☐ New Markets	
☐ Cost Reduction	☐ Value Engineering	☐ Design-to-cost
	☐ Reduce complexity	☐ Optimize process
	☐ Purchase optimize	☐ Reduce Overheads
☐ Asset Management	☐ Optimize 'Order to Cash'	
	☐ Optimize 'total Supply Chain'	
	☐ Optimize 'Purchase to Pay'	

Target Improvements

	Baseline	1999	2000	2001
% tender success	17.5%	20%	25%	30%
KA Africa turnover	R182m	R208m	R260m	R312
Increased turnover		R26m	R78m	R130m
Increase bruto profit		R5'3m	R13m	R21'6m
NE budgeted staff		R4'2m	R6'6m	R7'3m
NE additional cost	R4'8m*	R0'96m	R0'45m	R0'13m
NE benefit:		*R0'14m*	*R5'95m*	*R14'21m*

Validated with:

F Smit - Service Director — P Adrian - Services commercial
P da Silva - KA Director — N v Aulock - Financial director

Figure 9-3 Motivation Business Case for NE

The steps followed to create a business base was very much the same as the initial steps in the benefits case methodology. The most important difference in a business case is that it must also indicate implementation costs. The general steps followed for the NE business case were:

1. Identify the opportunities that will be realized, as well as costs involved.
2. Define targets for the costs and opportunities, and if possible project the break-even point. In the NE business case break-even was predicted within the first year. (1999: R0'14m benefit)
3. Formalize and scoreboard the business case. It also first needs to be validated by the process owners and then signed-off by the ESG.

Opportunity realization and results monitoring could only be done once NE was operational. In this event both costs and increased profits had to be measured.

9.3.3.3 Preliminary Engineering of the NE enterprise.

Various BPR process mapping and data flow methods, as well as best practices knowledge were used in this basic engineering phase of NE. Most of the architecture components were presented in the form of process flows. Best practices were of importance to ensure sound logic applied during the network design process, based on Workflow Management and Teamwork principles.

9.3.3.3.1 Relationship diagrams indicating NE integration in the organisation / business

The following functional - relation diagram indicated NE's main customers and suppliers within Sietel. These are the departments NE interacts with in its business processes.

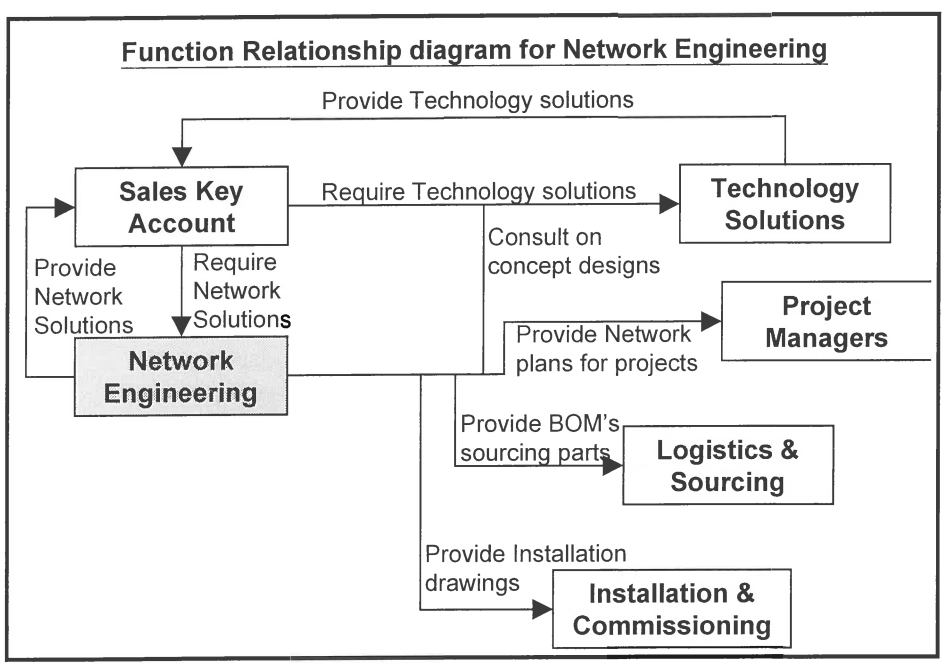


Figure 9-4 NE Function relationships with other functions

9.3.3.3.2 Supply Chain process flows indicating NE interaction in the business schedule

In relation to the function-relationship diagram, NE's interaction in the Supply Chain are indicated in the following process flows. These are parts of Sietel's overall Supply Chain process flow that acts as a generic business schedule with milestones at the top and responsible functions on the left axis. Figure 9-5 illustrates NE's interaction during the preparation of quotes for tenders and figure 9-6 illustrates NE's interaction after order release.

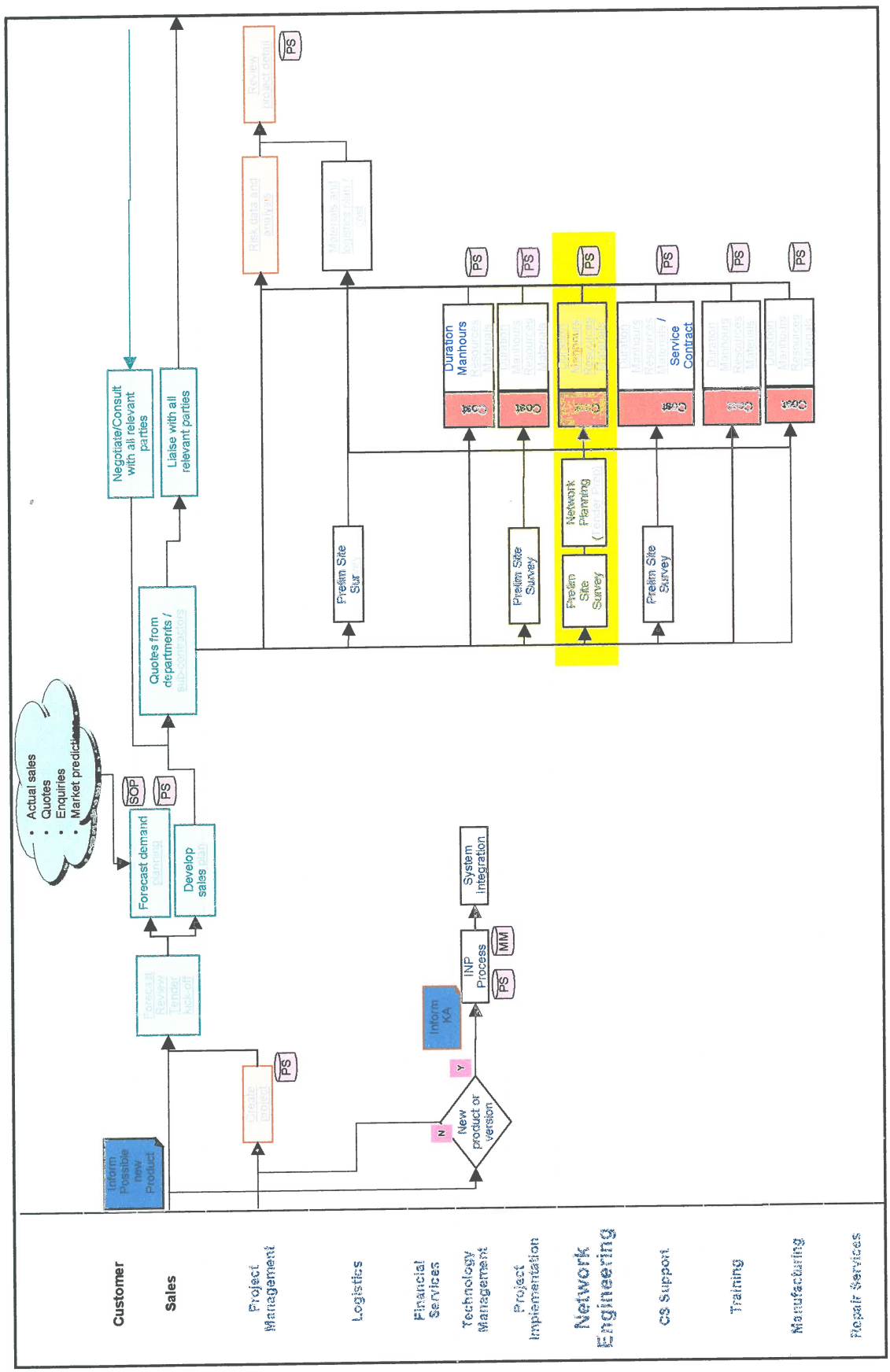


Figure 9-5 NE interaction in the Supply Chain process (1)

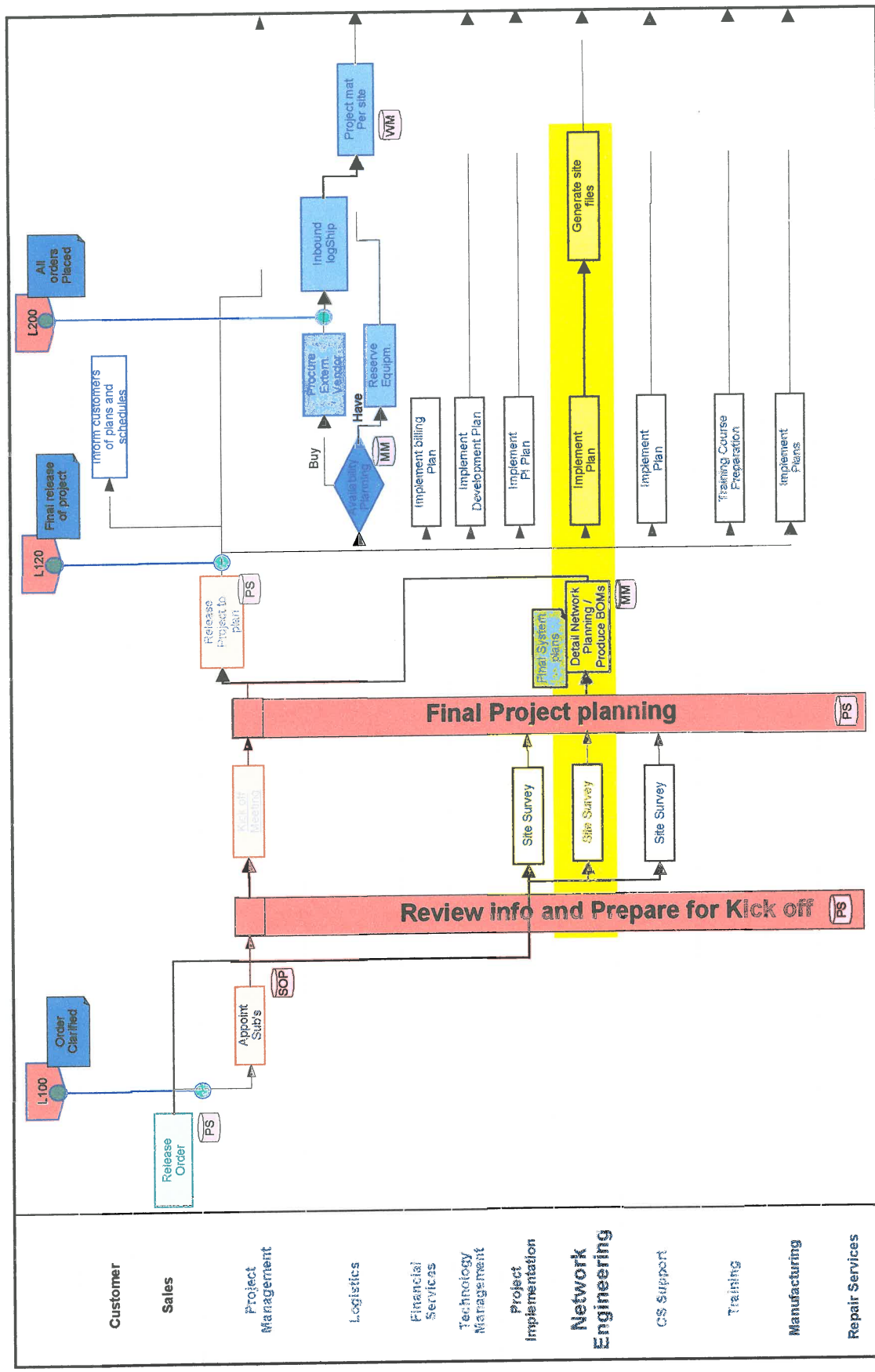


Figure 9-6 NE interaction in the Supply Chain process (2)

9.3.3.3.3 Business processes for NE

The NE services value chain is considered a high level process overview, with the Supply Chain interaction process being of intermediate detail. For each of NE's value chain services, detail business processes were identified. The following three figures are the detail business processes for NE. The arrows with descriptions at the bottom axis indicates relation to the value chain services.

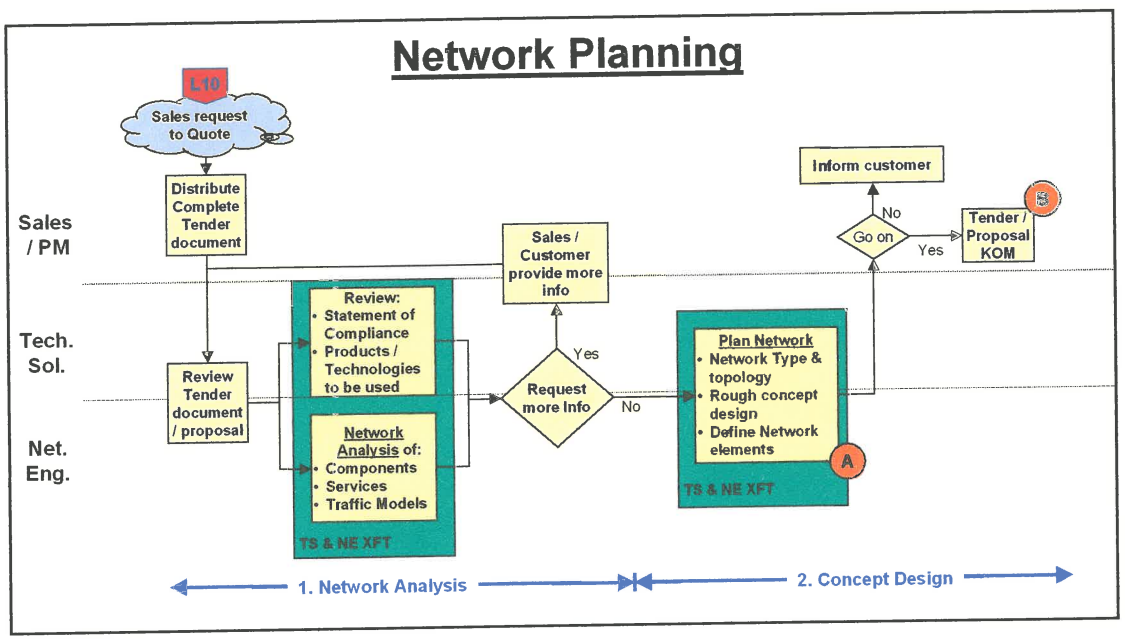


Figure 9-7 Detail NE business process (1)

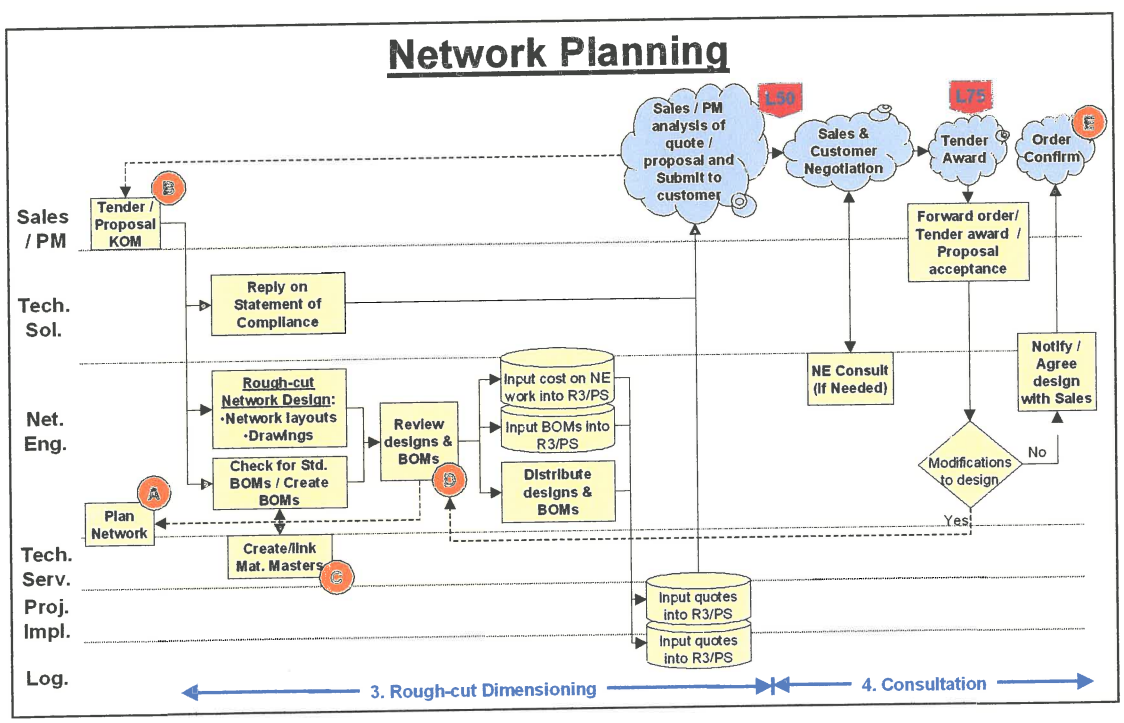


Figure 9-8 Detail NE business process (2)

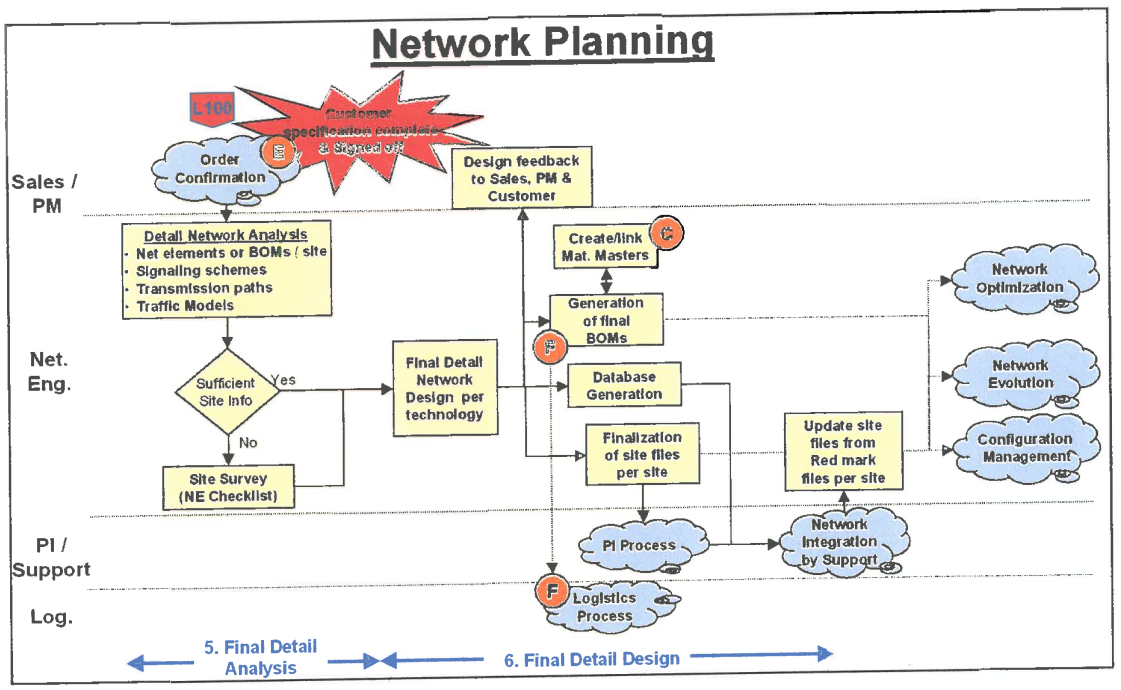


Figure 9-9 Detail NE business process (3)

9.3.3.3.4 The Matrix organisational structure required for NE

The organisational chart of NE has a matrix structure to support project interaction and teamwork. NE will mainly consist of four sub-departments, each specialising in one of the types of network technologies. Network Engineering generalists will then operate over all four sub-departments to serve projects with network solutions based on various combinations of technology. Figure 9-10 is an illustration of this organisational structure.

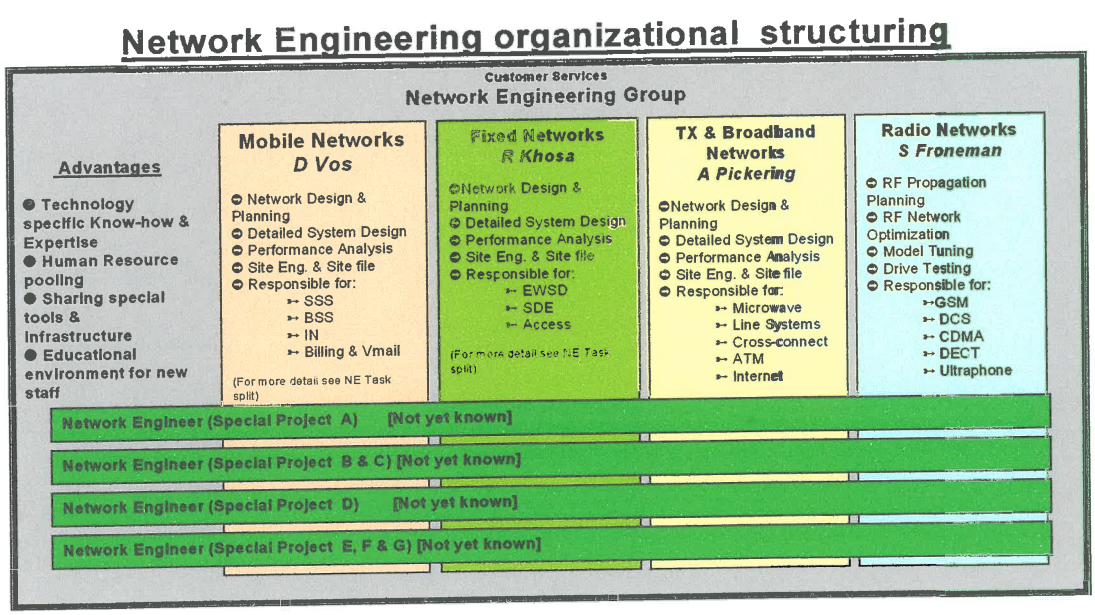


Figure 9-10 NE's matrix type org chart.

As a generic job description for all engineers within NE, the following skills and experience are required:

- **System Engineering.**
  - A Sound knowledge of System engineering and engineering management.
  - A BSc. Eng. or Nat. Dip. and extensive System Engineering Experience.
- **Network knowledge.**
  - A sound knowledge of Telecommunication Networks and Technologies.
- **Systems Operation.**
  - Sound knowledge of:
    - Business processes related to Network Operation.
    - Maintenance concepts for networks.
- **Configuration and data management.**
  - Sound knowledge of Configuration and data management.

9.3.3.4 Detailed Engineering phase for the NE enterprise.

To populate the detail engineering perspective of the NE architecture, tools and techniques from the BPR, Best Practices and Balanced Scorecard elements were used. Entity-Relationship and data flow models are used for information flow and application requirements. RACI charts define the roles and responsibility interfaces, and detail task descriptions combined with workflow descriptions act as working procedures for NE staff. The final piece of detail to complete NE's architecture is the KPI's relevant to the enterprise, composed into a NE dashboard.

9.3.3.4.1 Data model and flow indicating applications used by NE

Figure 9-11 is an Entity-Relation diagram of the data components with which NE works. It illustrates how customer specification are converted into network dimensions, then into equipment BOMs and material masters. The main outputs from this data process are in the form of customer quotes and installation files.

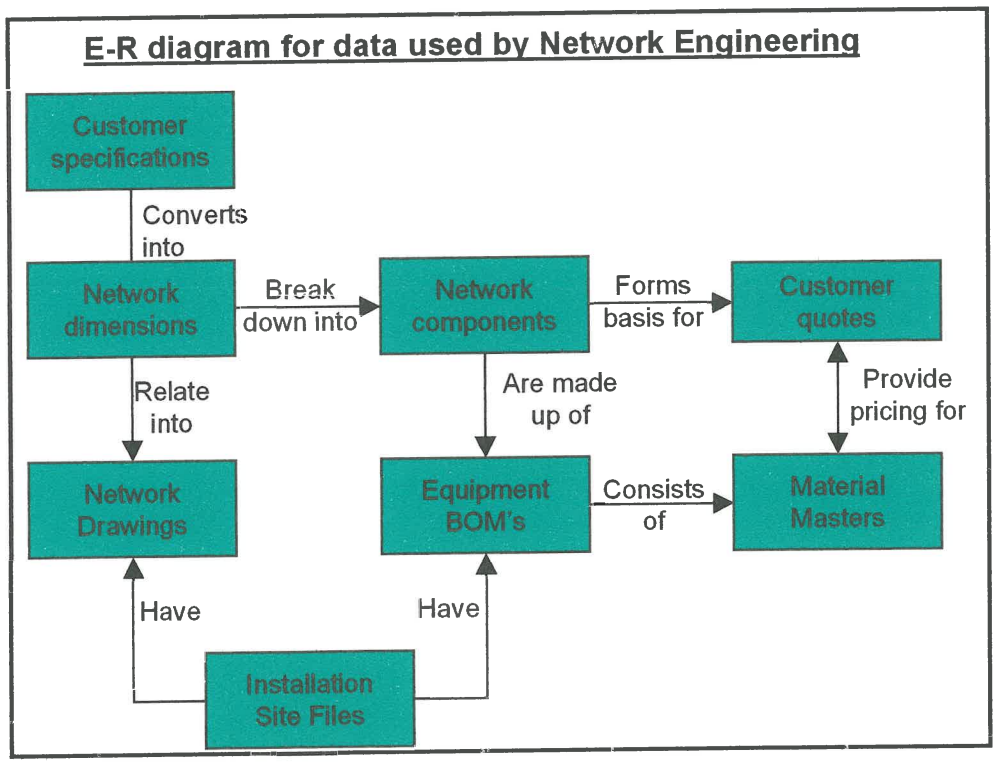


Figure 9-11 Entity relation diagram for NE's data model

The following figure is an unorthodox data flow diagram that illustrates the various applications used by NE. Network dimensioning activities are mainly done on the Leo tool set (all the "con-" tools), which produces the BOMs. These BOMs are downloaded into SAP R3 via "Export" software, and in SAP R3 the BOMs are used as material masters in customer and project related data.

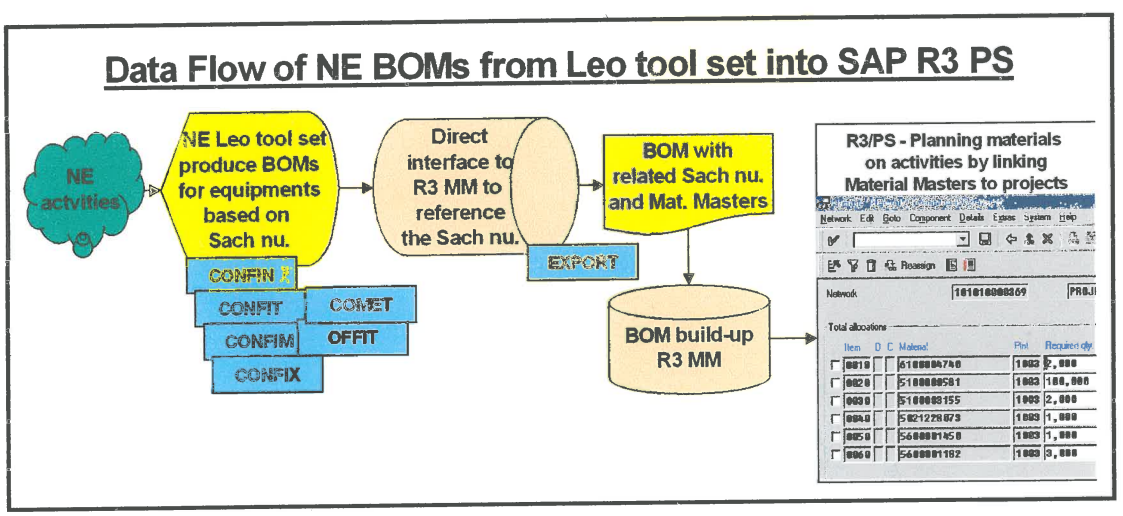


Figure 9-12 Data Flow from applications used by NE

9.3.3.4.2 NE RACI charts

Figure 9-13 and 9-14 are RACI charts for NE specific tasks. Most importantly it indicates at which points accountability is passed to and from NE. The activities are segmented according to NE value chain services as indicated on the left axis of each chart.

RACI: Network Planning

	Activity	Sales	Customer	PM	SPM	Tech. Sol.	Net. Eng.	Logistics	Proj. Impl.	Sup/TAC2	Cust. Train	Conf. Man	Tech. Man.
Network Analysis	Sales requests for quoting				A/R		C						
	Distribute Tender Docs for review	A/R											
	Review Tender Info / request				A/R	R	R						
	Review SOC, Technologies					A/R	C						
	Network Analysis					C	A/R						
	Request for Netw. Info / analysis				A/R	R	R						
Concept Design	TS & NE XFT Concept Design					A/R	R						
	Decide to go on & Tender KOM	A/R				I	I						
Rough-cut dimensioning	Reply on SOC					A/R							
	Rough cut dimension / design						A/R						
	Create / assign Std BOM						A/R						R
	Input BOM in R3						A/R						R
	Input NE quote in R3 PS						A/R						
	Distribute BOMs/Designs						A/R						
	Input logistics quotes							A/R					
	Input PI quotes								A/R				
	Sales quote to customer	A/R											

Figure 9-13 Network Engineering RACI chart (1)

RACI: Network Planning

	Activity	Sales	Customer	PM	SPM	Tech. Sol.	Net. Eng.	Logistics	Proj. Impl.	Sup/TAC2	Cust. Train	Conf. Man	Tech. Man.
Consultation	Contract Negotiation	A/R					C						
	Tender award	R	A/R				I						
	Check for design modifications						A/R						
	Order confirmation	R	A/R				I						
Detail Analysis	Detail Network Analysis						A/R						
	Site Survey						A/R						
Final / Detail Design	Final Detail Design						A/R						
	Update BOMs						A/R						R
	Finalise Site Files						A/R						
	Database design						A/R			C			
	Procurement & Logistics							A/R					
	Project Implementation								A/R				
	Red mark & return Site Files						C		A/R				
	Network Integration									A/R			
	Update Red marked Site Files						A/R		C				
Net. Opt.	Contract trigger Net. Optimisation	A			R		R						
	Network Optimisation						A/R						

Figure 9-14 Network Engineering RACI chart (2)

9.3.3.4.3 Detail task and workflow descriptions for all NE activities.

DETAIL TASK DESCRIPTIONS		*DETAIL WORKFLOW DESCRITIONS*			
Tasks	**Task Descriptions**	**Data entity / Document**	**R3 module / system**	Responsible person	**Required input Data**
Review Tender document / Proposal	Receive RFI / RFP / RFQ for Network Review customer Requirements Highlight requested dimensioning details. Reach consensus on general traffic parameters and SW versions to be used.	Notified with a Request Form Notified with actual doc. Or copy of doc. Notified by email Order on Export/R3 Request form	R3 PS / SM Export Confin	A/R: SPM; Sales C: NE	Customer requirement as per Tender / RFI
Network Analysis (preliminary)	• Network Requirement & Performance • Prelim. Path analysis • Prelim. Network analysis Determine: *Equipment to used *Relevant frequencies *Capacity calculations Analyse the customer request. Look at the global network impact & set questions to the request.	• RIFU • ICS Telecom • DMLE • Radio info • TEMS Link planner • Radio / Optic info • Parameter models	R3 Export Confin Tornado Planet Mapinfo	A/R: NE	• Link info. • Existing Network & system info • Customer Material List • Initial project assumptions • Rollout criteria
Request for more Network information	• Contact Sales • Contact Customer All inputs are necessary. Questions can be sent to the requesting party on detail that is not included in the request, but which is necessary to do the dimensioning.	Search Request forms to: • Sales • Customer		A/R: SPM R: NE, Tech. Sol	• Network Interconnect info • Path info • Site info (Location, suitability / Acquisition probability) Network Planning info
Techn Sol & NE team conceptual design	• Path Profiles • Link Budget • Network Nodes A general network layout and configuration is established by looking at the given traffic parameters, subscriber forecast's	• Customer • Tools • RFI / RFQ / RFD • Technical Sales		A/R: Tech. Services	Customer Req Link Info Radio info Path, site & Network info
Rough-cut dimensioning of Networks	• Determine network capacity needed • Determine the Network Elements to be used (Power required; Equipment lists for BOMs) • Rough Network layout in Tool The amounts of Network elements are calculated. Their positions are determined and a high level dimensioning of the network elements are done	• NE Webpage • Map info		A/R: NE	• Network Interconnect info • Path info • Site info • Network analysis / planning info • Survey documents

Table 9-1 NE Detail task and workflow descriptions (1)

DETAIL TASK DESCRIPTIONS		DETAIL WORKFLOW DESCRITIONS			
Tasks	**Task Descriptions**	**Data entity / Document**	**R3 module / system**	Responsible person	**Required input Data**
Create / Assign BOM's & link to R3 PS network	Creation of BOM's from SOW: • Use SW Tool to derive standard BOM • Use System manuals to derive additional add-on's • Use Andrews catalogue data to derive antenna info. • TM create MM (site specific) in R3 BOM's are created for each site and each network element for that site. BOM input into R3 is done by an Excel / CONFIT upload to R3.	• CONFIT • R3 • System Manuals • ANTDES	• Confit / Confin / Confim / Confix • Excel • R3 -MM • R3 - BOM	A/R: NE R: TM	• SOW • Survey sheet • PD Files • System components & Modules to be used
Distribute Network Designs & BOMs	• E-Mail NE & Sales All high level network element dimensioning is given in the format of performance descriptions(PD's), which can be used to price the network. The summary of all NE tasks are given in a file called a HLNDD.	• HLNDD • R3 BOM E-Mail	• R3 MM • Excel • E-Mail	A/R: NE	BOM Document. Contact persons within Sales & NE
Input NE cost estimates into R3 PS project	NE related R3 PS Networks must be updated & maintained for NE project activities and costs	•R3 PS Networks	R3 PS	A/R: NE	R3 PS project
Check for design modification during contract negotiation	• Add changes to original Rough Cut dim. Doc. Any small change in one network element might have an impact on other network elements. Negotiation on any changes should be checked by NE to evaluate the impact	• Already existing BOMs (R3 / Excel) & Drawings	• Confit / Confin / Confim / Confix • Excel • R3 -MM • R3 BOM	A/R: NE	• Original doc. • Modification to original doc. • Request for further info
Detail Network Analysis	• Same as preliminary network analysis • Analyse site info & site surveys • Plus Detailed info such as Specific Radio frequencies • Detailed Network layout etc. A review of all PD's must be done after doing the dimensioning of the network in more detail. Set suppliers have to be chosen. All lower level designs per network element have to be defined.	• Map info • Site info • Model tuning		A/R: NE	Survey documents Initial Network Analysis Prelim. Network design Map Info doc.
Perform a Site Survey	• Travel arrangements • Arrange contact persons • Acquire Site info, locations, survey forms • Travel from site to site • Fill in SS. Tick sheets • GPS readings • Take pictures of all sites • Req. Maps	• Tick sheets • Names of contact persons • Prelim network analysis doc. • GPS, RIFU, DMLE, • Camera photos • Maps		A/R: NE	• Travel data • Site info • Customer info • Location of cartographic office • Names and numbers of contact persons

Table 9-2 NE Detail task and workflow descriptions (2)

DETAIL TASK DESCRIPTIONS		DETAIL WORKFLOW DESCRITIONS			
Tasks	**Task Descriptions**	**Data entity / Document**	**R3 module / system**	Responsible person	**Required input Data**
Final Detail Network Design per technology	• Use collected data from site visit and rough cut dimensioning info. • Create link budget and path profiles. • All high level designs should be used as a basis. A lower level breakdown can then be done to suite specific network needs. • Produce detail drawings of floor plan and site layouts	• Detailed Network analysis doc. • Network dimension doc. • MAPINFO • Gathered info from SS sheets • RIFU / DMLE / ICS / TEMS LP	• Confit / Confin / Confim / Confix • Tornado • Export • Excel • R3 -MM • R3 - BOM	A/R: NE	• Site Survey info • Detailed Network analysis doc. • Network dimension doc. • Network Element data
Update BOMs	• Any changes to be added to existing BOM • Updates to BoMs after being reviewed by TM and Sales • Reload BoMs into R3	• R3 - BoMs	R3 - MM R3 BoMs	A/R: NE	SOW final Issue PD Files
Finalise Site Files	• Creation of file per site, with technical diagrams	• Site File	A/R: NE	•SOW final Issue •PD Files •Final Network design & drawing •Final BOM	• Installation teams to install equipment • Copy to be red-marked
Database design	Received MSI Radio info or Joborder or change request - Create relevant database or scripts for implementation		A/R: NE	• MSI radio data • Vodacom joborder	Supply database or script to OMC or relevant people
Update red marked Site Files	Update Changes to red-marked areas on Site Files from Installation teams	• Network design • Site File		A/R: NE	Red-marked files from PI

Table 9-3 NE Detail task and workflow descriptions (3)

Tables 9-1, 9-2, and 9-3 are detail task descriptions of each NE activity within its business process flow. (figures 9-7, 9-8 and 9-9) The task descriptions are combined with workflow descriptions to indicate the flow of information and control during the NE activities. Explanations are at operational level, with reference to the documents and systems used, and appropriate responsibility for each task. Thus these tables can be used by NE staff as procedures.

9.3.3.4.4 Key Performance Indicators linked to the NE Dashboard.

The last part of the detail engineering perspective for the NE architecture is the Key Performance Indicators (KPIs) defined for this function. It provides a feedback loop to the NE strategy by grouping the KPIs into a dashboard that is based on the Balanced Scorecard approach:

- Financial KPIs measure NE related turnover and costs.
- Business Partner KPIs measure NE's accomplishment of customer service.
- Internal KPIs measure efficiency based on optimal staff levels and quality findings.
- Organisational learning KPIs measure staff development and satisfaction in NE.

The intention of the dashboard KPIs is to provide a "bottom-up" measurement of NE's overall operational success.

Network Engineering dashboard

Objective	Measure	Track Freq.	Baseline	Target 1999	Report
Financial					
Measure NE business financially	Measure Project quotes (quoted cost versus actual cost's)	Monthly	R 182,332,000.00	R 208,000,000.00	**Willie Du Plessis**
Measure turnover per NE service offering	Costs/Man Hrs per service offering booked to sales.	Monthly	R 242.00	R 200.00	**Willie Du Plessis**
Measure amounts of overheads booked to projects	Unproductive (overhead) costs versus productive costs.	Monthly	N/A	R 2,650,000.00	**Willie Du Plessis**
Reduce Excessive overtime	Cost Control System	Monthly	R 786,000.00	R 407,500.00	**Willie Du Plessis**
Business Partners					
Customer expectations exceeded	External/Internal customer surveys for network optimisation,planning,expansion offered	Quaterly	54% service level rating	68% service level rating	**Willie Du Plessis**
Diversity of services (Measure number of services available for selling)	Measure number of services	Quaterly	4	4	**Willie Du Plessis**
Measure referals from previous projects/ customers	Number of customers requesting Network Planning,Optimisation,Evolution and Expansion	Quaterly	N/A	?	
Internal					
Reduce the Staff Turnover	Percentage of staff leaving NE group	Quarterly	30%	20%	**Willie Du**
Support Affirmative Action	% Black and gender(W/F) representation (JG 1-10)	Quarterly	20%	30%	**NS**
Reduce Excessive overtime	Cost Control System		27%	14%	
Staff Dialogue completion	% of NE staff with completed dialogues	Yearly	70%	85%	**NS**
ISO Quality status - Internal	Findings per Audit (Internal)	Quarterly	26	5	**NS**
ISO Quality status - External	Findings per Audit (SABS)	Half-yearly	2	0	**NS**
Organisational Learnings					
Measure types of training per year/employee	Management training, Technical skills and self development	Half-yearly	36%	60%	**PA**
Quality of Service from Network Engineering Department	Doug Eatwell Survey	Annual	22 findings	16 findings	**NS**
Empower our Employees	Employee Satisfaction Questionnaire (ESI)	Annual	45%	55%	**HS**
Transparency	Employee Satisfaction Questionnaire (ESI)	Annual	50%	60%	**HS**
Communicate Effectively	Employee Satisfaction Questionnaire (ESI)	Annual	47%	57%	**HS**
Supervision and Management	Employee Satisfaction Questionnaire (ESI)	Annual	43%	53%	**HS**
Development & Training	Employee Satisfaction Questionnaire (ESI)	Annual	47%	57%	**HS**
Recognition,Reward & Benefits	Employee Satisfaction Questionnaire (ESI)	Annual	51%	61%	**HS**
Job content & Satisfaction	Employee Satisfaction Questionnaire (ESI)	Annual	43%	53%	**HS**

Information not accurate for confidentiality purposes

Table 9-4 NE Dashboard & KPI's

9.3.4 Case Study Conclusion

This case study illustrated how concepts from five of the elements discussed in this dissertation were integrated into a BA/EA for a NE function within Sietel. The need to create the NE function was a result from strategy re-alignment by Sietel and formed part of its re-engineering effort. The elements of relevance for NE's architecture were:

- Business Architecture meta-models and approaches which were used to create a framework for defining the NE function.
- BPR modelling tools and techniques were mainly used to populate the NE architecture.
- Strategy deployment concepts with KPIs linked to a dashboard (in the Balanced Scorecard format).
- Economic Value Adding principles utilised to define a Business Case.
- Best Practices were built into the architecture by ensuring NE's processes support workflow management, teamwork and customer value concepts.

The elements not illustrated in this case study, namely project management and implementation drivers, are management activities that is not directly applicable for integration into these initial phases of a BA/EA. To ensure successful operation of NE though, these elements would be required to implement NE's architecture (the construct, operation and management phases of the PERA structure).

Even though this case study BA/EA does not explain the total re-engineering effort NE went through, it is an example of an outcome from the BPR process. Of course an architecture is only a documented blue print of the real enterprise, which in practice must be operational and realise the opportunities for which it was created. The advantage of such a BA/EA is that it sets a documented basis which can be used as a guideline for operation and continuos improvement.

9.4 Dissertation Contribution

This dissertation took an approach to the Business Process Re-engineering philosophy of analysing critical interacting elements that contribute to its success as a management philosophy. A chapter was devoted to each element and it was discussed from theoretical and practical perspectives.

The first element addressed the challenge that BPR, or any Change Management project is faced with: to make explicit links between operational improvements and financial benefits. Economic Value Adding opportunities were defined for this purpose and a Benefits Case methodology described to identify opportunities, define targets and track Key Performance Indicators to realise financial benefits.

In chapter three the Balanced Scorecard as a management philosophy were discussed and reference were made to how it complimented BPR. Through aligning organisational strategy with BPR initiatives, both philosophies support each other towards creating effective structures.

Various BPR techniques and methodologies was studied in chapter four, and discussed with specific reference to the approach followed in the Sietel Case study. This methodology with its tools and interventions can be summarised in the following re-engineering approach:

1. Identification of the re-engineering opportunity (as performed in the A&D phase for Sietel)
2. Analysis of the current business processes.
3. Designing of the new business processes.
4. Implementation and embedding of the designed processes.

Best Practices and Benchmarks should be part the BPR methodology, but because of the sheer volume of best practice ideas, it was discussed in its own chapter. This chapter concluded that the main role of Benchmarks is to serve as reference during 'As-Is' analysis, and to serve as a gauge for establishing an aspiration for the organisation. While Best Practices are most useful when focussing attention during 'To-Be' designs and implementation phases.

Basic Project Management principles were reviewed in the sixth chapter, with specific reference to its elements and how it is applied in various areas of the industry. The Project Management elements that were evident in the Sietel case study was also mentioned and discussed. The chapter concluded that the situational management style, resource orientated utilisation, and configuration management change control techniques of Project Management provided the ideal structure for managing a re-engineering process.

It is well known and proven that most management philosophies experience their worst criticism when it has to be implemented. Chapter seven looked at various critical success factors for implementation in the form of "Do's and Don'ts" lists, but also suggests that successful BPR

implementation depends on five implementation drivers. Application of sufficient skill and energy to these drivers will determine BPR success:

1) Assign appropriate ownership to re-engineered processes.

2) Campaign the objectives and later the results from re-engineering.

3) Plan and resource the implementation phase properly and manage it as a business project.

4) Measure Key Performance Indicators regularly and make the results visible.

5) Utilise Information Technology tools as enablers for the new processes.

The last element examined were that of Business / Enterprise Architectures. These are meta-models already existing, and depending on the type of business needed to be engineered, an applicable model can be selected, and the businesses or enterprises can be developed using the frameworks.

As a final word, this dissertation took a thorough approach to BPR with its critical components. Once again it is stressed that this is not an all encompassing handbook for BPR, but rather a toolbox with various BPR tools that can be used selectively. In the Network Engineering case study this approach was demonstrated through the "plug-and-play" business architecture that selectively utilised various of the elements from this toolbox to design and implement an important new function in the Sietel organisation.

This field is by no means exhausted in what there is to be learned from it, and future researches that could emanate from this study are:

- Scrutinising of the various types of EVA opportunities mentioned and searching for more examples of strategies and methods for linking operational improvement projects to financial benefits.
- Critical Success Factors for implementation of management philosophies, and the testing of the 'driver frameworks' still requires research that the business industry can benefit from (especially with the focus on IT enablers).
- Business Architectures is still a field that is in its 'early days' and can only benefit from experience sharing and meta-model testing. To link and quantify tangible business benefits to Business Architectures is one of its main challenges to resolve.

The CD ROM accompanying this dissertation is a collection of related research articles and contains a library of training presentations that can be used by aspirant BPR practitioners.

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Appendix: BPR Toolbox Knowledge Base

Elements to manage Organisational Re-engineering

Masters Degree Dissertation in Industrial Engineering

Study Leader: Pieter Conradie
Casper-Cobus Koorts
9730406

April 2000

Keywords: *Balanced Scorecard; Benchmarking; Benefits Cases; Best Practices; Business/Enterprise Architectures; Business Process Re-engineering; Change Management; Economic Value Adding; Project Management; Implementation Drivers.*

This is an Index page to Articles, Downloaded WebPages, PowerPoint Training Presentations and Various Reports related to this dissertation (most of these were used as references).

Click here to open the dissertation itself.

HTML web page and Adobe format Articles

1. EVA Opportunities	2. BPR Methodology	3. Best Practices	4. Balanced Scorecard
5. Project Management	6. Implementation Drivers	7. Business Architectures	

Training material: PowerPoint presentations and Word reports

BPR & Team training	Methods & Approaches	Best Practices & Case Studies	Templates & Word docs

Downloaded HTML WebPages and Adobe format Articles: Applications & Documents/Acrobat3/Reader/AcroRd32.exe

1. Economic Value Added opportunities related Information	
Engineering Economy terminologies Including a definition of **Economic Value Adding (EVA)** and other terms ***Go to Benefits Case related training material***	**Engineering Economy Manual SECTION I** This section introduces the concepts of Causality, Reference Plan, cash flow diagrams, time value of money and related formulae and some of the resultant economic evaluators.
	Engineering Economy Manual SECTION II This section uses discrete start of period capital and end of period expenses to introduce, illustrate and work out examples for the following items, using discrete time value of money concepts from Section I.
	Engineering Economy Glossary
Lexicon top campaign	Lexicon descriptions of economic BPR benefits

2. Business Process Re-engineering Methodology related Information	
Drivers and Tracers for BPR by the Helsinki School of Economics ***Go to BPR methodology related training material*** ***Go to BPR tools related training material***	**Business Process Re-engineering** Key Aspects, Scope and depth of BPR **Empirical Study** Experiences of BPR projects
Massachusetts Institute of Technology's Centre for Co-ordination Science looks at an approach to perform process analysis, identify workflow, and SW to support processes	**Tools for inventing organisations: Toward a handbook of organisational processes** This paper describes a novel theoretical and empirical approach to tasks such as business process redesign, enterprise modelling, and software development
An Introduction to workflow by GFI	**Workflow Technology**
3. Benchmarking and Best Practices related Information	
Brecker Associates: achieving **Maximum Value Performance** Descriptions of Best Practices, methods, tools and interventions used to achieve dramatic improvements in customer satisfaction, process productivity, and PROFITS. Based on strategy planning, optimisation techniques and aggressive team-oriented approaches that are used to enhance organisational performance and capability	**6 Sigma methodologies** **Customer 6 Sigma Case Study** **Business Value Planning** **Creating Design to Manufacturing Value** **Business Value Tools.** **Design Value Tools** **Training / Facilitation** **Value-Adding Ideas** **Cost Reduction**
Siemens top+ award A programme to promote the sharing of Best Practices between its Business Units and regional companies world-wide. ***Go to Best Practices & Case Studies presentations***	**Benchmarking** **Business driver scorecards** **Portfolio optimisation** **Cutting costs** **Increasing sales** **Asset management** **Improving quality** **Accelerating innovation** **Target agreement** **Best practice sharing**
Malcolm Baldrige National Quality Award	**MBNQA 2000 Criteria for Performance Excellence** (Adobe PDF Format)
European Foundation for Quality Management	**EFQM Excellence Model**
4. Organisational Strategy and Balanced Scorecard related Information	
Balanced Scorecard Explanations, discussions and examples of the Balanced Scorecard ***Go to Balanced Scorecard related training material***	**A Guide to the Balanced Scorecard: Performance Management Methodology** by US Department of Commerce **Demystifying the Balanced Scorecard** A CorVu whitepapers with a clear and concise explanation of the Balanced Scorecard which discusses its origins, attributes and what it accomplishes for the enterprise.

	Automating the Balanced Scorecard A CorVu whitepapers with a non-technical discussion of the capabilities necessary to automate a Balanced Scorecard system.
	Business driver scorecards Balanced Scorecard explained by the Siemens top+ award programme
5. Project Management related Information	
The Project Management Institute's PMBOK	**The Project Management Body of Knowledge (PMBOK)**
Michael Greer's **Project Management website** *Go to team related training material*	**The New Project Manager's support Pyramid**: A Framework for PM Training & Support
	20 Key Project Manager Actions and Results
	14 Key Principles for PM Success
6. BPR Implementation related Information	
Drivers and Tracers for BPR implementation A Study on 32 Case Studies of BPR projects	**Drivers and Tracers of Business Process Changes** by the Helsinki School of Economics
A review by the Gartner Group on the impact of BPR and the most effective techniques	**Review of BPR by Gartner Group** (in Adobe PDF format)
CorVu whitepapers explaining IT approaches to Business Performance Management	**Business Performance Management - A Data Warehousing Application-** CorVu Explains the relationship between Business Performance Management and data warehousing.
	Business Insight Beyond OLAP CorVu Corporation discusses several critical success factors to consider when selecting a performance management solution.
An Introduction to workflow by GFI	**Workflow Technology** (in Adobe PDF format) A description of Workflow and its use in business
7. Business Architectures related Information	
IFIP-IFAC Task Force, 1998	Generalised Enterprise Reference Architecture and Methodology (GERAM) Version 1.6.2
Zachman Institute for Framework Advancement (ZIFA) **Framework Articles**	**Enterprise Architecture: The issue of the century**
	The Framework for Enterprise Architecture
Yves Pigneur from Université de Lausanne analyse the use of information and communication technologies (ICTs) by companies adopting new organisations paradigms for reaching their strategic objectives.	**A framework for designing new information systems** A 3-by-3 matrix framework with two dimensions.

Back to index

PowerPoint Training presentations and Word document reports

BPR Training Material (PowerPoint presentations)	Managing Change
	Running Effective Meetings
	Brown Paper Training Material
	RACI chart training
	KPI overview
	Success factors for BPR projects

	PDR-Visual Factory Training
	Generic Onboarding Training Pack
Teamwork Training Material (PowerPoint Presentations)	Unleashing the Potential of Teams
	Culture change through teamwork
	Team Building & Problem Solving
	Coaching & Feedback
BPR and Supply Chain Methodologies (PowerPoint Presentations)	Gemini Methodology - N Munday
	Re-engineering Back to Basics - R Absil
	Implementation Methodology for a Supply Chain system
	Systems Architecture Design methodology by CapGemini
	Benefits Case Methodology
Balanced Scorecard Approach & examples (PowerPoint Presentations)	Balanced Scorecard
Supply Chain Best Practices (PowerPoint Presentations)	Supply Chain Overview - N Munday
	Supply-Demand balancing by Gemini
	Supply Chain Best Practices by Gemini
	Supply Chain Performance Metrics (Gemini-LondonShop)
	Supply Policy objectives
	Service Level Agreement Overview
	Procurement Best Practices
	Inventory management Best Practices
	Logistics & Transportation best practices
Case Study presentations (PowerPoint presentations)	SAPICS Case Studies of re-engineering
	ICN Value Chain presentation
Master Templates for PowerPoint Slides	Benefits Case Template
	Charter template
	Meeting Templates
	Brown Paper masters
	RACI Template
	Flash Report templates
	360 Review form Template
Additional Word documents	Service Level Management & guide to SLAs
	Methods to manage BPR projects
	How Jack Welch transformed GE
	Sietel Top+ Team Award report

Back to index