# Value Chain/Network Improvement

Graham McLeod

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## Purpose

A value chain or network model allows us to identify related activities which should add value to end customers, thereby allowing an enterprise to achieve a margin over the cost of inputs. The documentation, analysis and improvement of the value chain/network can improve business performance, delivery to clients and benefits to stakeholders. It can serve as a very good starting point for detailed process architecture and design. It can provide valuable input to debates around changing business models, relationships with business partners and outsourcing discussions. It can focus efforts and priorities in moving towards higher levels of process automation.

## Description

The concept was introduced by Michael Porter of Harvard Business School and has gained wide popularity for understanding the fundamentals of a business or non-profit organization at a high level. The value chain views the organization as a chain, or series, of processes, each of which adds value to the product or service for the customer. In the diagram, the **primary value chain** is the activities represented in green, below the midline. The **support activities** are shown in blue above the midline. The primary activities are essential to obtain necessary inputs, transform them into a desirable product or service, sell them to the customer, deliver the product or service to the customer and provide support in the field.

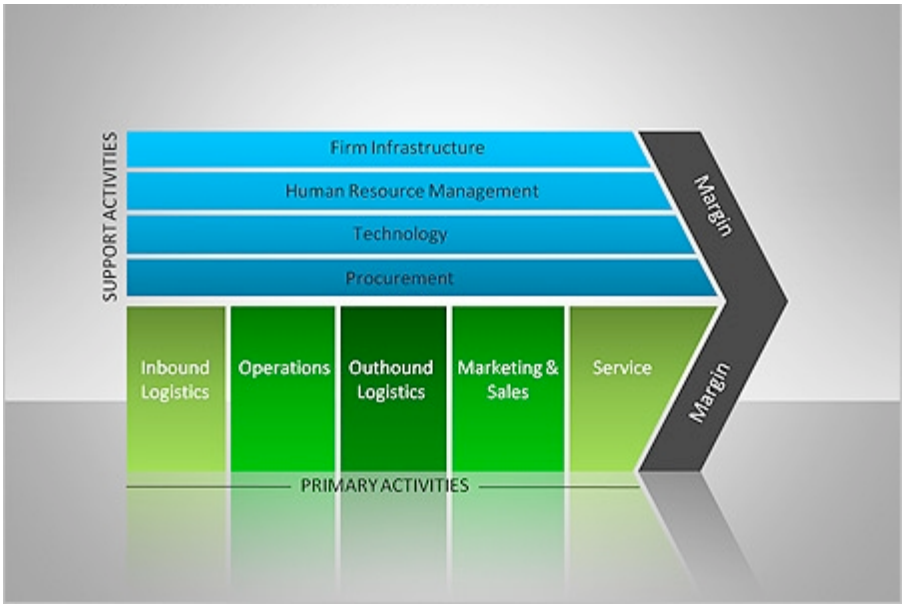


*Figure 1 - Classic Porter Value Chain*

The support activities include all necessary functions to allow the proper operation of the primary activities. These include procurement to manage supplier relationships, technology to define product characteristics, human resource management to provide skilled personnel, premises and plant and information technology and systems.

The goal is to ensure that the primary value chain is effective and efficient. To the extent that it is done well,the organization can increase the value added and the margin of value of output over cost of input. In a business, this will typically mean increased profits. In a non-profit, it will typically mean more output or better quality services for the same or reduced inputs.

The Porter value chain works particularly well in manufacturing, or in industries where there is a physical product of some sort which moves through a manufacturing, assembly or transformational process. An example is agriculture, where inputs of seed, water, fertilizer, labour and infrastructure of land produce salable crops which are then distributed to markets. You can read about the original here: Porter, M. E. "Competitive Advantage: Creating and Sustaining Superior Performance", The Free Press, 1985.

The model works a little less smoothly in industries where the product is intangible e.g. financial services, assurance. Nevertheless it can be applied. An example is the banking value chain from lionsshare.com shown below:

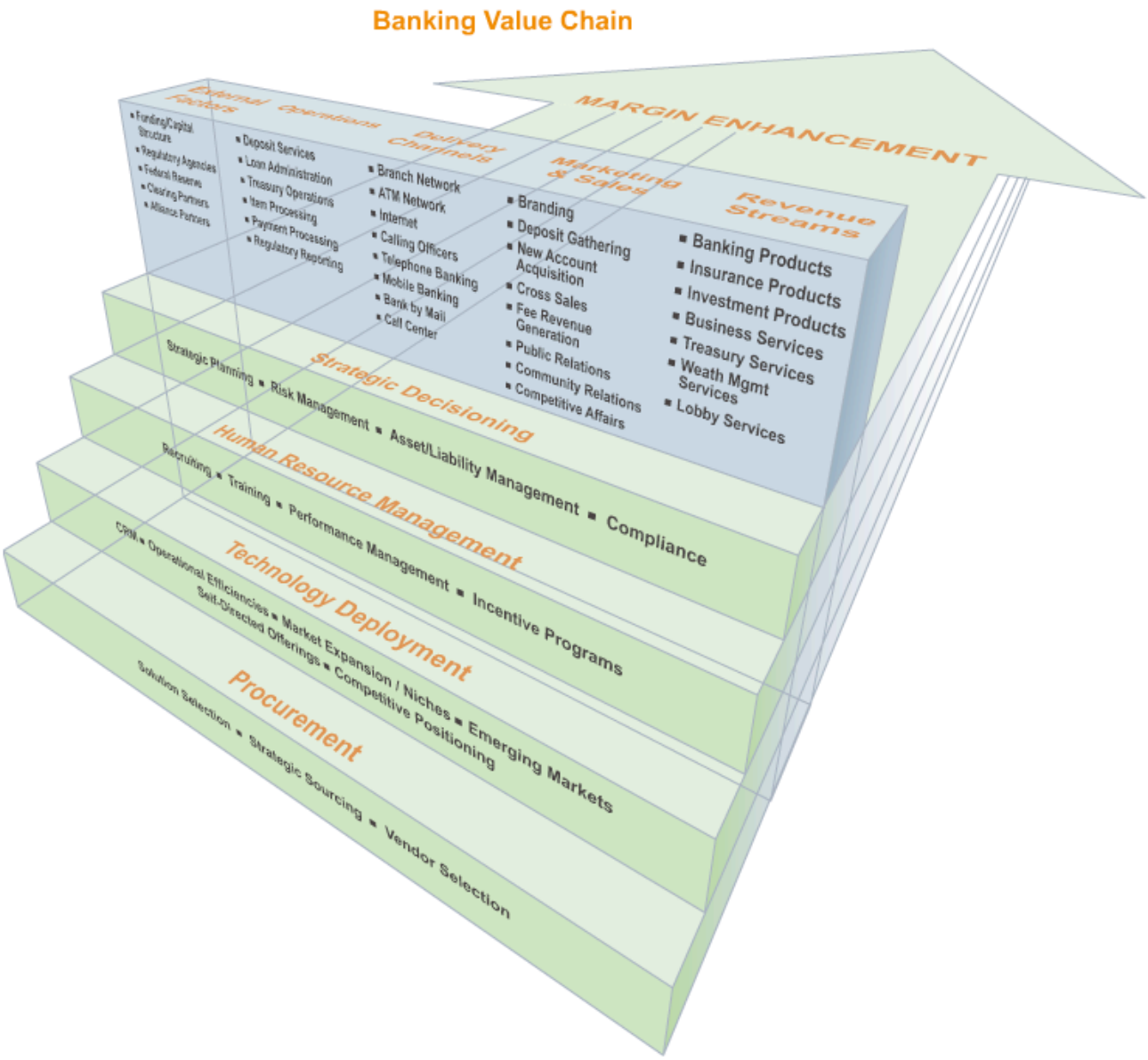



*Figure 2 - Lionsshare Banking Value Chain*

We have extracted the primary value chain activities below to make them more readable:

| External Factors | Operations | Delivery Channels | Marketing and Sales | Revenue Streams |
|---|---|---|---|---|
| • Funding/ Capital Structure<br>• Regulatory Agencies<br>• Federal Reserve<br>• Clearing Partners<br>• Alliance Partners | • Deposit Services<br>• Loan Administration<br>• Treasury Operations<br>• Item Processing<br>• Payment Processing<br>• Reulatory Reporting | • Branch Network<br>• ATM Network<br>• Internet<br>• Calling Officers<br>• Telephone Banking<br>• Mobile Banking<br>• Bank by Mail<br>• Call Centre | • Branding<br>• Deposit Gathering<br>• New Account Acquisition<br>• Cross Sales<br>• Fee Revenue Generation<br>• Public Relations<br>• Community Relations<br>• Competitive Affairs | • Banking Products<br>• Insurance Products<br>• Investment Products<br>• Business Services<br>• Treasury Services<br>• Wealth Mgmt Services<br>• Lobby Services |

*Figure 3 - Lionsshare Banking Core Value Chain activities*

Other authors have highlighted the critical role of marketing in the value chain and also the need, in today's rapidly changing world of ever shorter product life cycles, for including the product definition actions in the primary value chain. A key proponent of some of these ideas is Philip Kotler. His extended value chain model is shown below:

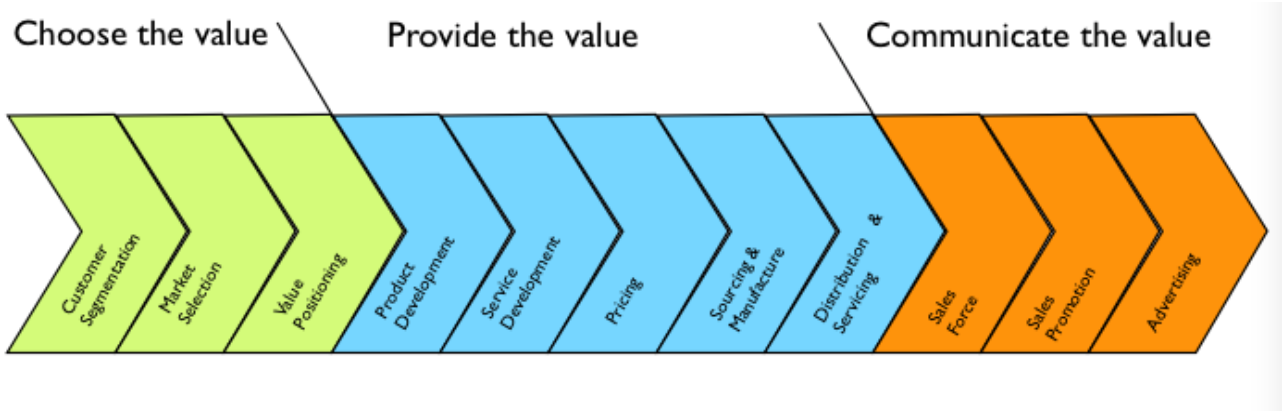
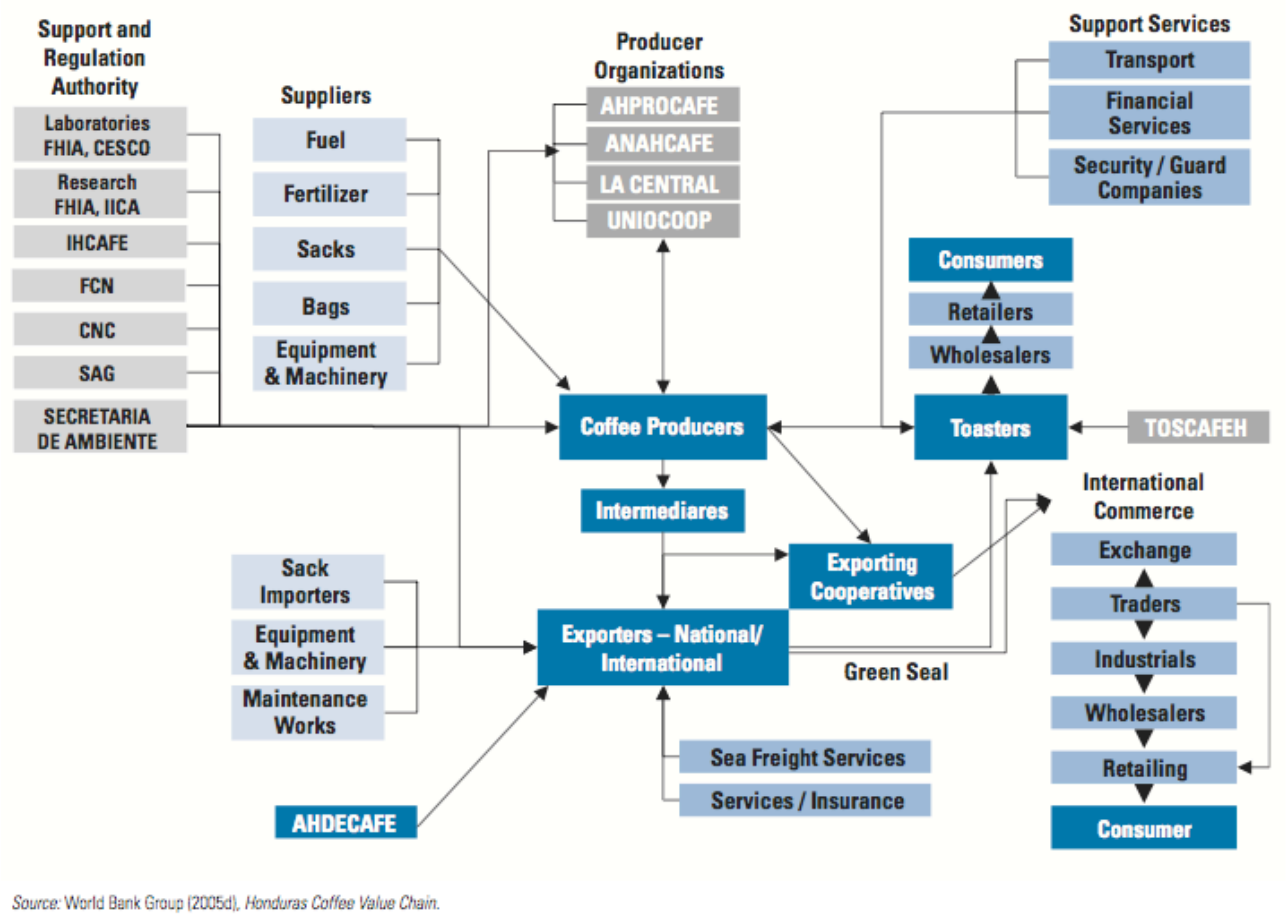



*Figure 4 - Kotler Value Chain*

Notice the strong marketing focus of understanding customers and markets at the beginning, and the sales, promotion and advertising at the end. Also, in the core activities, the inclusion of product and service development. This can be a more appropriate value chain in

organizations that rapidly configure virtual products out of components (e.g. in financial services, content and media, telecommunications industries.

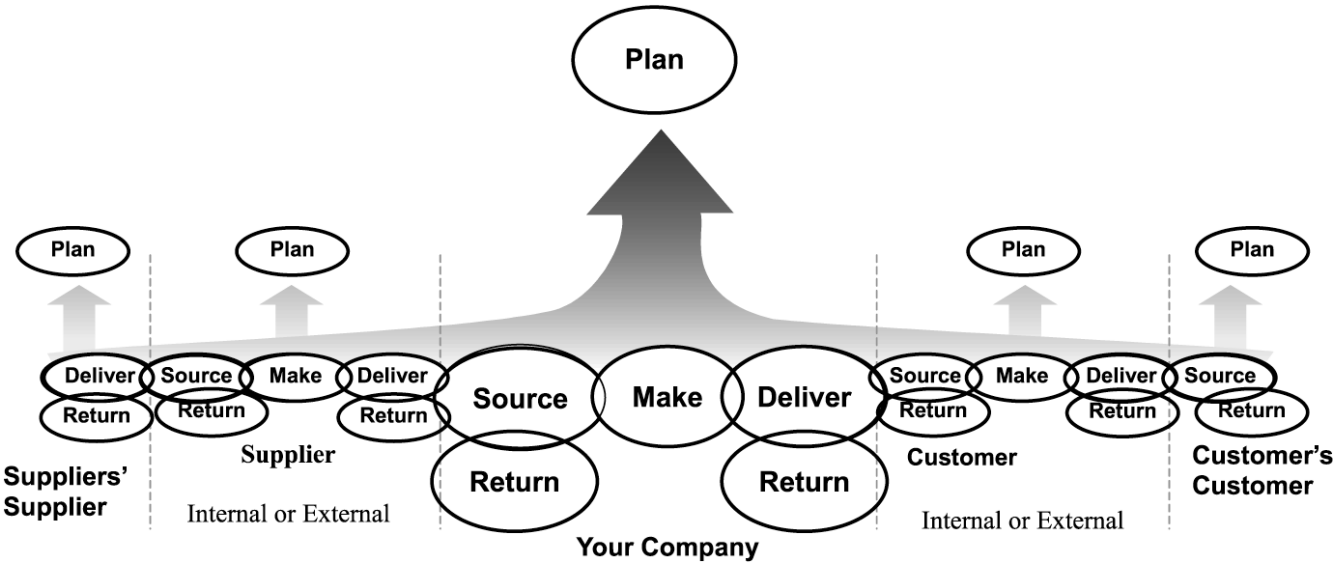
We can use the value chain at the level of a single organization (or even business unit within the organization), but it can also be employed on a larger scale - e.g. to model the interaction of players in a given industry, or country. In these cases, the sequence of value adding activities is not necessarily linear and contained to a given sequence. Thus the idea of value networks is born. Value networks take the ideas of value chains and extend them to situations involving multiple players and where things are not necessarily linear. Some talk about value constellations, where an organization seeks to play a central coordinating role within a value network. A value network for the Honduran coffee industry is shown below:




Source: World Bank Group (2005d), *Honduras Coffee Value Chain.*

*Figure 5 - Honduran Coffee National Value Network*

## Reference Models using the Concepts
### SCOR – Supply Chain Operation Reference




Source: http://www.emeraldinsight.com

Figure 6 - Extended Supply Chain

The preceding figure illustrates how our value chain is linked with suppliers upstream and customers downstream. Suppliers products can be our raw materials; our products can be our client's raw materials etc. Significant improvements can be achieved for multiple participants by considering the extended value chain. Reducing inventory held by all parties, for example, can result in faster product introduction and lower pricing, benefitting end customers and increasing margins along the way.

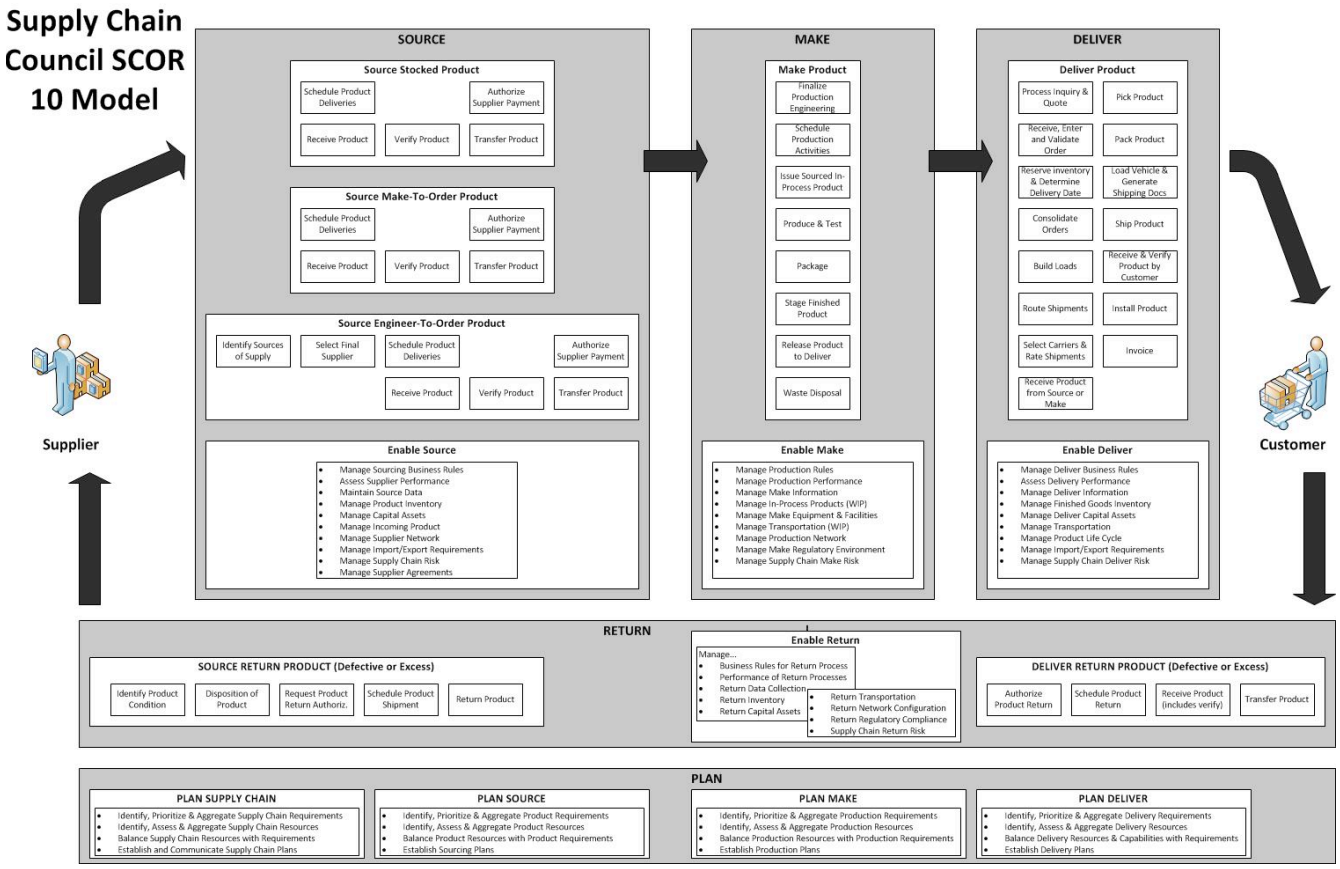
The Supply Chain Council has defined a model known as SCOR, the Supply Chain Operation Reference. This provides a common language, standardised metrics and common business practices which are claimed to improve the bottom line performance of companies using them by 1-3% per annum.

SCOR can help with business problems including:
- Strategy Development
- Merger, Acquisition or Disposal of companies
- Supply optimization and Re-engineering
- Standardization and Streamlining core processes
- Management alignment
- New business start-up
- Benchmarking
- Process Outsourcing

The following quote from the Supply Chain Council provides details on how SCOR is typically used:

> SCOR® is typically used to identify, measure, reorganize and improve supply chain processes. This is accomplished by a cyclic process of:
>
> - Capturing the configuration of a supply chain A supply chain configuration is driven by:
>   - Plan levels of aggregation and information sources
>   - Source locations and products
>   - Make production sites and methods
>   - Deliver channels, inventory deployment and products
>   - Return locations and methods
> - Measuring the performance of the supply chain and comparing against internal and external industry goals Supply chain performance is focused on:
>   - Reliability - achievement of customer demand fulfilment on-time, complete, without damage etc.
>   - Responsiveness - the time it takes to react to and fulfill customer demand
>   - Agility - the ability of supply chain to increase/decrease demand within a given planned period
>   - Cost - objective assessment of all components of supply chain cost
>   - Assets - the assessment of all resources used to fulfill customer demand
> - Re-aligning supply chain processes and best practices to fulfill unachieved, or changing business objectives This re-alignment is achieved through a combination of:
>   - Classic process re-engineering from "As-Is" to "To-Be"
>   - Lean Manufacturing analysis and process change
>   - Six-Sigma analysis of defective processes
>   - Theory-of-Constraints analysis of systems of processes to elucidate root-cause issues
>   - ISO-9000 style process capture and control
>   - Balanced SCORcards and benchmarking
>   - And a host of other combined industrial engineering based best-practice techniques in improvement

A more detailed look at the activities in the SCOR model is given by the following figure:




source: Supply Chain Council [www.supply-chain.org](http://www.supply-chain.org)

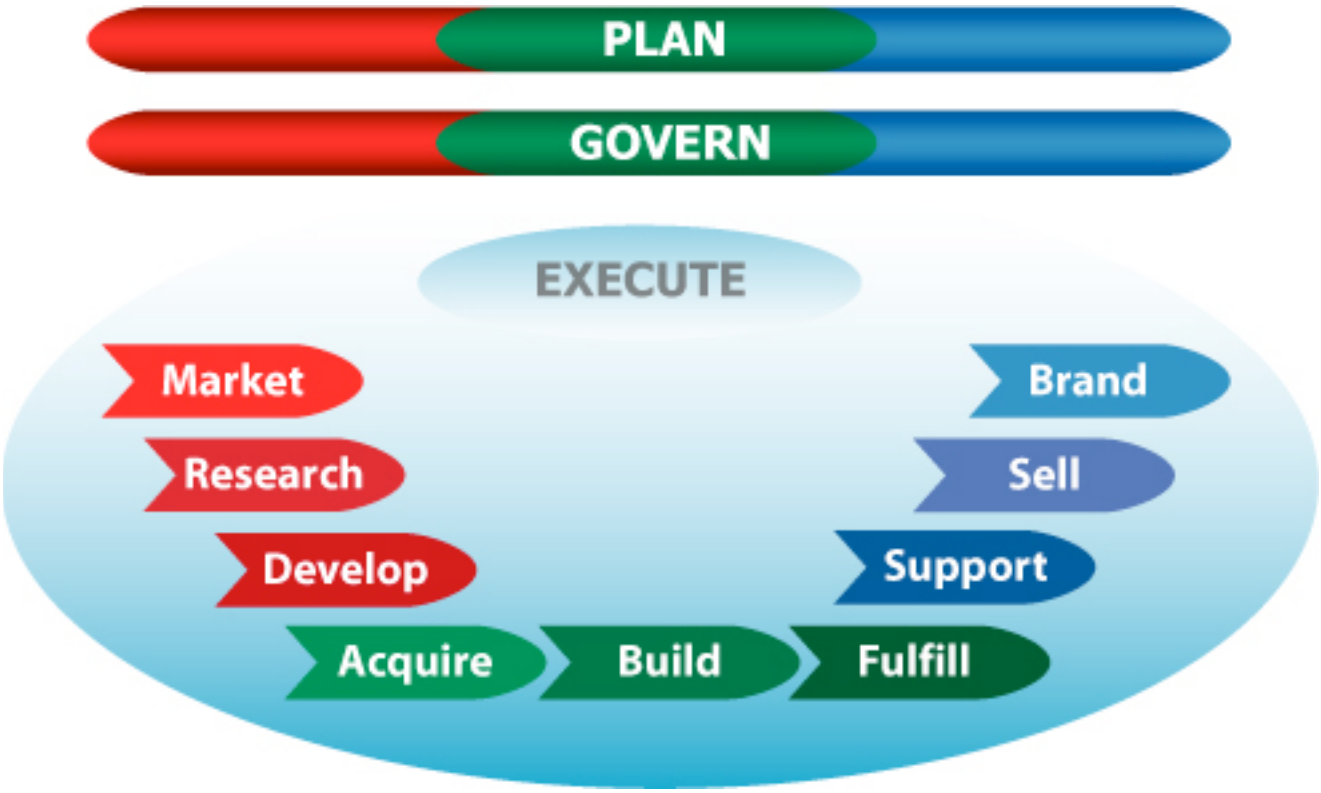
*Figure 7 - SCOR Activities in More Detail*

SCOR is certainly worth a look if you are involved with analysing and optimising supply chain processes.

## VCOR (Value Chain Operational Reference) and VRM (Value Reference Model)

These models are developed by a consortium (the Value Chain Group) and accessible (in detail) to members. Membership is not free, but is not prohibitive. The models extend value chain concepts to address strategic, tactical and operational levels. They place emphasis on the aspects of planning, governance and metrics which were previously not well covered in classical value chains.

At each level (strategic, tactical and operational) there is a pattern of plan, governance and execution, with appropriate activities per level identified. The tactical level picture is shown below:




source: http://www.value-chain.org/framework/value-reference-model/

*Figure 8 - VRM Tactical Level Value Chain*

In similar vein to the Kotler model, market, product development, selling and brand are given quite high prominence.

The VRM model provides good detail with decomposition of activities / processes within the value chain steps. An example is the coverage of Brand, Sell, Support activities shown below:


*Figure 9 - VRM Tactical Activities Expanded*

Each of these is defined in a structured way at more detail with relevant Inputs/outputs, metrics and practices:

# D03 - Design Product

The process of converting product requirements into a working product or service configuration.

**Inputs/Outputs**

| In | From |
|---|---|
| Corporate Performance Targets | VP3 |
| Design Partnerships | DG07 |
| Design Standards | DG03 |
| Engineering Change Request | D05 |
| Product Performance Analysis | U07 |
| Product Requirements | D01 |
| Product Technology Plan | D02 |
| Product Usage Analysis | U07 |
| Project Contract | M07 |
| Validated Technology | R05 |

| Out | To |
|---|---|
| Engineering Change Notice | DG08 |
| Material Cost Estimates | A02 |
| Material Cost Estimates | A01 |
| Packaging Specification | B05 |
| Performance Feedback | DG02 |
| Product Configuration / BOM | D04 |
| Product Configuration / BOM | D05 |
| Product Manuals | U05 |
| Product Specification | D04 |
| Product Specification | D05 |
| Prototype / Simulation | D05 |
| Service Manuals | U06 |
| Storage Instructions | B06 |
| Test Plan | D05 |

**Metrics**

**Adaptilabilty**
Standard Parts and Process (by Product)

**Cost**
Cost of Design Ratio
Engineer Change Notice Cost
Standard Part Ratio
Warranty Cost per Unit Shipped

**Innovation**
Average Number of Parts
Components per Product, Average
Number Of Product Designs
Part Count Reduction
Parts Recyclable Ratio
Parts Reuse Ratio
Product Cost from Royalty Fees
Product Revenues From Royalty Fees
Performance to VOC at Prototype
Product Part Complexity

**Reliability**
Total Number of Engineering Changes

**Practices**

Concurrent Design
Phase/Stage Gate Process
Rapid Prototyping
Simulation
Virtual Product Development

*Figure 10 - Definition of an activity within VRM*

There is further detail too about the calculation of the metrics and the definition of the inputs and outputs. This is well beyond the coverage of typical value chains. It can provide valuable guidance, input to or validation of models created as part of an enterprise architecture or process engineering effort.

As mentioned, VRM also addresses metrics. This is achieved through value cards, to emphasise the relevant value and metrics at each level. An example is given below of an enterprise level value card with metrics.


*Figure 11 - VRM Enterprise Level Value Card*

VRM pays good attention to three kinds of flow: viz:

- Physical flow - e.g. raw materials, finished goods
- Information flow - the exchange of specifications, orders, invoices, shipping information etc.
- Monetary flow - the payments and receipts relevant to exchange of value

In defining our value chains and networks it is very useful to examine these three aspects and how they can be optimised. We recommend taking a good look at VRM - see the introduction at: [http://www.value-chain.org/framework/value-reference-model/](http://www.value-chain.org/framework/value-reference-model/)

## Representation

For presentation purposes and working with executives in interactive facilitated sessions, it is often best to represent the value chain in a similar way to the Porter or Kotler models, or perhaps the patterns in VCOR. These will quickly become cumbersome once more detail is explored though. It is usually better for later more detailed analysis to capture the steps in a repository (or at least a spreadsheet) and have the ability to capture more detail than just a sentence for each value chain stage. Some of the things you may want to know about a stage include:

- Parent Value Chain (what is it part of)
- Step Statement (the one sentence or phrase which very briefly describes this stage)
- Description (brief description of what this step achieves)
- Current Level of Satisfaction (ranked from 0 completely unhappy to 7 completely satisfied, no change contemplated)
- Challenges (what are the problems or issues that this step currently presents)
- Opportunities (what are we aware of that could improve this step?)
- Responsibility (who is responsible for this step? Typically a business unit or a business partner)
- Relevant Metrics (how can we measure effectiveness of this step?) and for each metric:
  - Current Level
  - Benchmark Level (average of industry competitors)
  - Target Level (what we need to achieve) by (Date)
- Volumes (if relevant and how measured)
  - Current
  - Anticipated __ by ___ (date)
- Key inputs
  - Physical/Material
  - Information
  - Financial
- Key outputs
  - as above
- References
  - People or other sources of information that inform the analysis
  - Industry sources of best practice or reference patterns

*Figure 12 - Value Chain Step Properties*

*Source: Inspired*

An example may illustrate the above:

| ABC Bank | |
|---|---|
| Parent Value Chain | Primary Value Chain |
| Step Statement | Acquire Capital |
| Description | All activities performed by the bank to acquire capital which is then employed to provide loans and to ensure the bank has adequate reserves. It includes the taking of deposits, borrowing from the central reserve at favourable rates, holding assets and accepting investment funds. |
| Current Levlel of Satisfaction | 3<br>The bank requires higher levels of capital than it currently has. The current reserves do not qualify for Basel II compliance, which will prohibit us from trading in most first world countries. |
| Challenges | The bank is not attracting sufficient deposit funds. This is due to perceived (and historically actual) poor customer service. Customers and prospects need to be convinced that service has and will continue to improve. |
| Opportunities | New legislations recently announced will allow us to offer more attractive deposit accounts with lower fees and easier access to funds. We should exploit these as a matter of urgency to attract more deposits. |
| Responsibility | Service is the responsibility of Customer Service and Branch Operations. Attractive Products is the responsibility of Product Development |
| Metric | Loan to Deposit Ratio<br>Current: 170%  Benchmark: 120% Target: 115% by 2015Q2 |
| Volumes | New Deposit Accounts per Annum<br>Current: 12 500  Target: 20 000 by 2015Q2<br>Net Deposits after Withdrawals per Annum<br>Current: $2.4 Bn  Target: 3.2 Bn by 2015Q2 |

| ABC Bank | |
|---|---|
| Key Inputs | New deposit accounts<br>New deposits<br>New investment accounts<br>New investments<br>Relevant industry rates<br>Relevant currency rates<br>Repo Rate (reserve lending rate)<br>Stock and Instrument daily trading prices |
| Key Outputs | Capital for lending and reserves<br>Metrics detailed above |
| Sources | Banking Industry Council<br>Retail Bank CEO (John Simpson)<br>Risk and Compliance Officer (Mary Bligh)<br>Basel II and III Accords |

*Figure 13 - Value Chain Step Definition Example*

*Source: Inspired*

## Analysis

When we have a picture or understanding of the current (or even proposed) value chain, we can then do a variety of analyses to determine how it can be improved. Typically we might look at:

- **Time**
  Analysis of time will include the overall time from procurement of raw materials to delivery of product and establishment of services after the sale as well as the time taken to achieve all the processes and sub-processes along each step of the value chain. In rapidly evolving industries it is also imperative to look at product development and introduction times.

- **Resource**
  Analysis of resources will include physical resources (such as tools, equipment), monetary resources, personnel as well as systems and information resources. We should be aware of resource consumption, resource constraints and how things could be achieved with less resources.

- **Value Added**
  Value Added analysis is at the core of a value chain. At each step analysis should be done to show where value is being added and where value is not being added. This will include value added to products, resources, time, etc. Opportunities should be identified where

additional value can be added without significantly increasing time, costs or resource consupmption.

- **Cost**
  Analysis of cost of procurement as well as internal processes and resources should be examined to ensure that cost is kept to a minimum without reducing quality or increasing processing time. Cost can often be reduced by reducing time. Examples include having to carry less raw material stock by improving ordering processes, or having to have less management time consumed in oversight of a manufacturing process. Automation can also help to reduce costs.

- **Margin**
  An analysis of the organization's margin with respect to the value chain will show just how well (or poorly) the value chain is performing. Margin is normally expressed in profit terms for commercial undertakings, while it might be expressed in service delivery or quality terms for non-profits.

- **Quality**
  We need to understand the quality of product produced or service delivered. We should always seek to improve quality. A surprising fact is that increasing quality can actually decrease costs, thereby having a dual effect of happier customers and lower costs, leading to improved margins.

- **Risk**
  Good governance requires that we avoid, or at least minimize, risk. We should identify risks and seek opportunities to eliminate or ameliorate them.

- **Degree of Automation**
  This is the extent to which the process is supported by technology (e.g. continuous process manufacturing; robot assembly etc.) and information systems which can provide scheduling, sequencing, monitoring and control. Automation, done properly, can reduce costs and increase quality by getting machines and systems to do dangerous, boring or highly repetitive work, while using people to do more creative things, such as designing new products and processes.

- **Responsibility**
  Increasingly, organizations need to focus on those things that they do exceptionally well. This means that we need different functional specializations within organizations to have high levels of expertise (e.g. product design, manufacturing, client service, marketing etc. ). It also means that we may consider outsourcing aspects of our operation that are not our core competence, e.g. printing, managing office facilities etc.

- **Performance**
  Overall performance is a composite of many or all of the above factors. Relative performance to other parts of the value chain and to industry benchmarks can help us to focus on areas that need major attention and to prioritise changes that will yield results more quickly.

## Improvement or Radical Redesign?

In some cases value chains can be incrementally improved by many small changes, sometimes on a continuous basis. This is analogous to the Japanese concept of Kaizen, where many small improvements cumulatively improve quality, service and value over time. On the other hand, new technologies, legislation, social structures etc. may offer the opportunity to radically re-engineer the value chain, thereby gaining a strategic advantage over competitors or even creating new markets, products or services in a “blue ocean” type of scenario where there is no competition (yet!).

Two examples of industries where technologies are radically reshaping value chains are:

- Physical manufacturing where 3D printing technology allows sending designs around the world instantly via networks and digital messages to create products where required. This can eliminate most of the traditional raw material purchasing, manufacturing, finished goods inventory and distribution of the conventional value chain

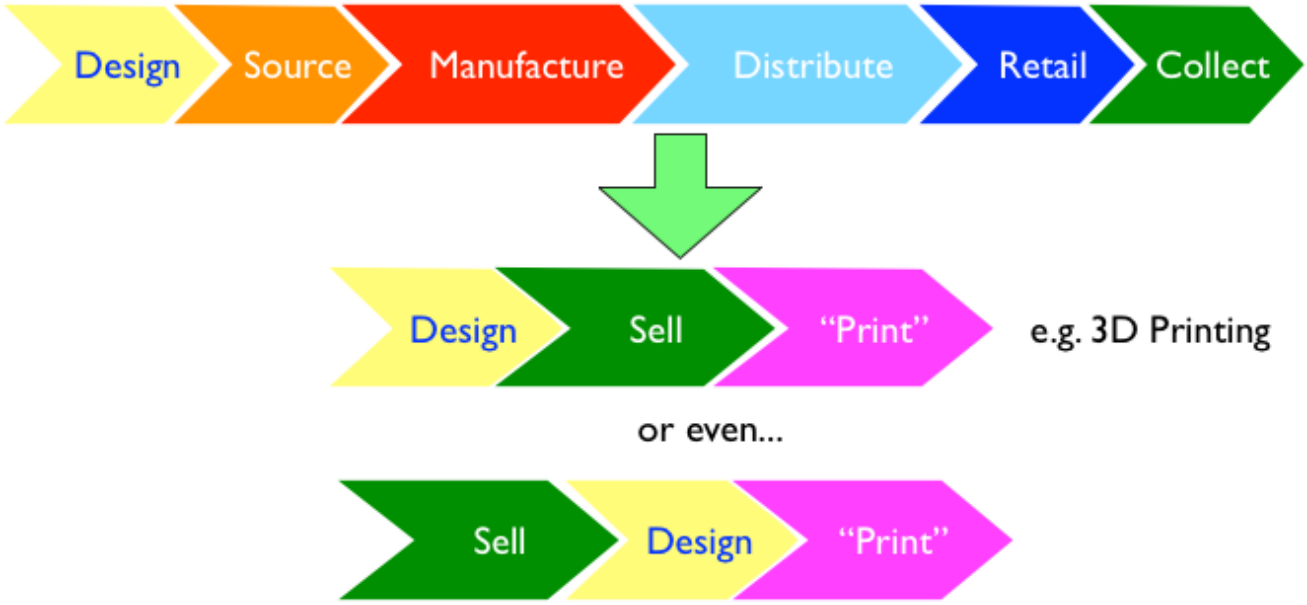



*Figure 14 - Vanishing Value Chain in Manufacturing*

- Publishing, where authors can now use online platforms to generate finished electronic publications and market these worldwide without editors, publishers, book retailers and all the accoutrements of the traditional trade


*Figure 15 - Vanishing Value Chain in Publishing*

- These kinds of radical changes in an industry value chain make it imperative to look wider than your organization's own boundaries and to consider what radical changes may be taking place. When value chains are re-engineered, you want to be in a piece that remains!

Things we may want to achieve when planning a new value chain include:

- **Eliminating Steps or Activities**
  Where this is made possible by technology, systems or changed circumstances (e.g. legislation or social structures)

- **Outsourcing Steps or Activities**
  This can include outsourcing to partners, but also transactional use of outside facilities and getting suppliers or clients to do more. Banks have used this to great effect with automated tellers and Internet banking largely replacing branch teller transactions.

- **Shortening Time**
  This can enhance customer service as well as reducing time that resources are tied up. For example, reducing the time taken to handle a customer request makes the client happy, but also frees time of the support person to attend to another matter. Reducing product introduction times can allow us to reach a market first, thus having a first mover advantage.

- **Reducing Resource Usage**
  By doing things more quickly, or more intelligently, or via automation. An example would be a new process which allows higher extraction of a valuable commodity, say platinum, from a raw material. Another would be an improved layout algorithm that will allow us to get more parts from the same raw material stock. In telecommunications, a new encoding algorithm that would allow carrying more bandwidth on the same infrastructure.

- **Reducing Risk**
  This can be achieved by increasing skill, having better controls, increasing levels of automation or eliminating sources of hazard and error. Better procedures and processes can certainly help. Improved governance mechanisms in the organization (e.g. steering bodies, following governance frameworks) can improve matters too. Adopting industry

reference models, using known good patterns or using industry solutions (e.g. ERP systems) can also lower risk.

- **Reducing Costs**
  Can be achieved through more intelligent algorithms, better processes, reduced waste, reduced time, better use of resources, selective outsourcing etc. Waste can be reduced by improving quality and lowering risk.

- **Improved Social Responsibility**
  We should look for ways to become better corporate citizens by reducing energy consumption, eliminating waste and polution, improving jobs and quality of work and pursuing equitable employment practices, for example**.**

- **Adherence to Strategic Goals and Principles**
  Hopefully the organization has clear strategic goals and principles spelt out for how it wants to operate in achieving them. We should always keep both in mind when designing a new value chain.

## Next Steps

Value chain analysis and redesign is usually just the start of a larger process. It is normally followed by necessary changes in various other models, designs and activities, for example:

- Defining new products or services
- Redesign of business processes
- Acquisition or creation of supporting information systems
- Automation of processes or activities
- Contracting with suppliers for outsource services
- Organization design to ensure structures, resourcing and skills are appropriate
- Information and data modeling to ensure that necessary information to support new models is available
- Implementation of new supporting technologies
- Introduction of new governance measures and metrics
- Monitoring of projects to implement change and the effectiveness of changes

## References

Porter, M. E. "Competitive Advantage: Creating and Sustaining Superior Performance", The Free Press, 1985.

LionsShare consultants: lionsshare.com

Supply Chain Council (SCOR model): www.supply-chain.org

Emerald Insight Research http://www.emeraldinsight.com

Value Chain Org http://www.value-chain.org/framework/value-reference-model/

Inspired: http://www.inspired.org