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THE VALUE CHAIN IN SERVICE OPERATIONS STRATEGY: RESOURCE - ACTIVITY MAPPING

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Abstract

This paper explores the use of the value chain concept suggested by Porter as a tool in establishing service operations strategy. The original model has been adapted to emphasise the operational context to produce a framework for considering service delivery to meet strategic objectives. The use of the revised model as for resource activity mapping within a workshop environment described.

1. The Basis for Competition

The idea of a value chain was first suggested by Michael Porter (Porter 1985) as a way of presenting the build of value (as related to the end customer) along the chain of the activities which go to make up the final offering to the customer. Hergert and Morris (1989) state, " The fundamental notion in the value chain analysis is that a product gains value (and costs) as it passes through the vertical stream of production within the firm (design, production, marketing, delivery, service). When created value exceeds costs a profit is generated".

The concept of *value* of a product or a service is associated with products and services being viewed as a *bundle* of attributes (Lancaster, 1975). The creation of this *bundle* can result from a number of configurations of the value chain so that a particular firm's configuration and resulting bundle of offerings to its customers will be unique. This is the basis of the concept of competitive advantage. Reed and DeFillippi trace the concept back to Chamberlin (1939) with a development by Selznick (1957) who linked competitive advantage to *competences* developed within a firm. Competences and competitive advantage were seen as part of the development of strategy and Hofer and Schendel (1978) state that competitive advantage is "the unique position an organisation develops vis-a-vis its competitors through its patterns of resource deployment". However, as pointed out by Reed and DeFillippi, competencies and competitive strategy are still viewed as independent variables and performance is the dependent variable.

The move to competitive advantage being at the centre and, in Reed and DeFillipi's view, being the dependent variable came with Day (1984) and Porter (1985) when competitive advantage is seen as being the purpose of strategy so that competitive performance and competitive advantage are directly linked. In Porter's terms the firm's competitive strategy is based either on low cost or differentiation, derived from the way in which resources are configured within the value chain. Four other developments to the concept of competitive advantage may be explored.

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1.1 Perceived added value and price

Porter (1985) suggested that competitive advantage could be gained either by a differentiation strategy or a low cost strategy and he warned of the danger of firms being "stuck in the middle". This polarised view has been challenged by Mathur (1988) and Bowman (1991). Mathur suggests competitive advantage based on differentiation or price. Differentiation is ascribed to four attributes; the nature of a product, image, expertise in supporting the customer, and personalisation (ie the process of dealing with the customers). Mathur sees competition on price only occurring when there is no differentiation on any of the four dimensions.

Bowman challenges the "stuck in the middle" proposition and sees competitive advantage being based on *perceived added value in use* (determined in the customers' terms) related to price. Firms may be seen to move in a direction to either increase or decrease perceived added value and/or price with implications for aspects of differentiation, efficiency and costs.

1.2 Organisational Culture and its Impact on Competitive Strategy

The role of organisational culture as a way of explaining the management of change and the accomplishment of desired strategic outcomes has been suggested by Johnson (1992). His suggestion of an organisational cultural web to encompass formal organisational structures and control systems and the informal factors which influence both the process of work and the way people talk about what is happening. The cultural web gives an approach to understanding the complexities of a (service) organisation. Consequently it is possible to gain some understanding of why aspects of the cultural web which enhance competitive advantage are difficult for a competitor to copy.

1.3 Causal Ambiguity

Reed and DeFillipi (1989) have explored the reasons for a firm sustaining competitive advantage. They base their work on the concept of *causal ambiguity* taking the idea of Lippman and Rumelt (1982) that causal ambiguity is "the basic ambiguity concerning the nature of the causal connections between actions and results". By this they mean that the most effective barriers to competitors copying actions and eroding competitive advantage is when they do not understand how the competitive advantage is derived. The issue being often how fast competitors can understand and then copy. Reed and DeFillipi explore the link between causal ambiguity and *tacitness, complexity* and *specificity*.

Tacitness is skill and knowledge which comes from learning and experience and "crucial to the value of tacitness is the inability of even a skilled performer to codify the decision rules and protocols that underlie performance. Thus, tacitness generates ambiguity through the skilled operator's own level of unawareness of the actions he or she undertakes".

Complexity arise from core competences which are inter-dependent and therefore difficult for one individual to understand or copy. " Causal ambiguity ensues from complexity and so the potential for imitation by rivals through observation is limited.

Specificity arises from the four types of specificity suggested by Williamson (1985): site, physical asset, dedicated asset and human asset. These can be highly inter-

related internally and in the relationship with suppliers and customers in ways which lead to causal ambiguity.

Reed and DeFillipi argue that the following relationships exist:

* tacitness and ambiguity are linearly related.

* complexity and ambiguity are curvilinearly related as the increase in the number of interactions between competences is not arithmetic as the number of competences increase.

* specificity and ambiguity may be linearly related for human asset specificity as it is analogous to tacitness but the combination of specificities make the overall relationship non-linear.

The suggestion is made that tacitness, complexity and specificity interact so as to increase causal ambiguity.

Causal ambiguity is related to competition and barriers to imitation by Reed and DeFillipi. The barrier to imitation is increased by increasing ambiguity and lowering of competition. This would be expected from Porter's view of competitive forces (Porter 1980). The potential for ambiguity and hence the creation of a barrier is suggested to be related to the added value. High added value firms have a greater potential for increasing ambiguity than low added value firms.

1.4 Organisational Capabilities

A similar concept for establishing competitive advantage has been suggested by Stalk et al (1992) in terms of organisational capabilities which may be seen as contributing to causal ambiguity. This corresponds with Stalk et al's view that corporate strategy should be based on business processes and not on processes and products among other factors.

2. The Value Chain

Porter's original value chain model (Porter 1985) is set in the context of a traditional manufacturing firm and sees the primary activities being, inbound logistics, operations, outbound logistics, marketing and sales, and service with secondary or support activities relating to the infrastructure of the firm, human resource management, technology development, and procurement. Porter uses his model to explore competitive advantage through differentiation and cost drivers.

Porter drew attention to the fact that the value chain or in many instances networks of chains comprising a value system were not all within one organisation. Some of the chain or network lies outside under the control of suppliers or agents and distributors. Also Porter identified the importance of linkages between the different stages and from support systems to the primary value building activities. These linkages can be seen to increase ambiguity as defined previously.

The use of the value chain paradigm in a service context was suggested by Porter who gives as an example the various stages in passenger air travel. In his service example he abandons the manufacturing model with the primary and support activity divide and concentrates on the steps in service delivery. He concentrates in this re-formulated model on the cost drivers. In his service example he concentrates on the reconfiguring of the value chain to gain cost advantage.

The basic concept of the value chain has been used by strategists to explain the success of various firms (Johnson and Scholes 1988) in pursuit of a differentiation or low cost strategy. Also the framework of the value chain has been used as the basis of a resource audit (Johnson & Scholes 1988). Other functional disciplines such as marketing and accounting have adopted the concept. Accountants have used it towards establishing costs along the chain both at a strategic level (Herget and Morris 1989) and as part of the development of the activity based costing in services (Innes et al 1990). These authors have highlighted some of the problems associated with obtaining true costs around critical activities when they are shared by different strategic business units or functional departments. The idea of cost benchmarking of competitors value chain has been suggested by Fifer (1989). Marketeers have taken the idea of a benefit chain in the formulation of marketing strategy (Bower and Garda 1986). The cost and marketing implications have been combined into assessment of customer profitability (Howell and Soucy 1990).

The original manufacturing model for the value chain as proposed by Porter has little meaning for many service organisations who cannot relate to the terms of the primary activities, inbound logistics, operations, outbound logistics, marketing and sales and service. This seemed to be implicitly recognised by Porter in his presentation of a value chain comprising the main steps in an operational flow for the delivery of a service. However he did not explore the support activities of a firm's infrastructure, technology, human resource management and procurement within this amended structure.

3. The relationship of service strategy to the service operations task and service delivery

If strategy is seen as the pursuit of competitive advantage the link between the formulation of service strategy and operational service delivery would seem to be vital. Armistead (1990) proposed a model for the development of service operations strategy linking the service operations task to the service delivery system. The model makes implicit assumptions about the value chain in the definition of the service operations task in terms of the customer service dimensions and resource productivity and in the definition of the service delivery system. However the model as it stands does not make an explicit statement of how the value is built in operational terms.

It is a recognition of this gap from using the service operations strategy model with service organisations which has caused a review of its use in the formulation of service operations strategy. A revised value chain paradigm which has a strong operational focus provides the missing tool. The starting point for the re-design goes back to the simple model of customer service proposed by Albrecht and Zemke(1985) with its three contributory dimensions of service strategy, systems, and people. In the formulation of the service operations strategy we are making the link between the service strategy and the systems (in Albrecht and Zemkes' terms) and service people.

The service strategy can be stated in terms of the competitive direction defined by the perceived added value from the service in the consumers' eyes and the price which is received (Bowman's approach). The price (seen as being equivalent to value for money) has implications for cost structures if acceptable contribution is to be gained. The service operations task makes a statement of what the service has to do well operationally to deliver both the perceived added value (made up of the customer service dimensions) at the price (meeting resource productivity targets) for the demand mix for the service or services which are required over a period of time.

It is in the link between the service operations task and the service delivery system where the value chain also has a place. If moving from the service operations task to a definition of the service delivery system in the type of detail proposed by blueprinting (Shostack 1984, Kingman- Brundage 1988) or Service Mapping (Gummerson 1991) misses two important links. First, the link between the structure and operational activities involved in delivering the service and meeting the strategic goals and second the link between resources used in different stages of the service delivery.

To fill this gap and taking account of Maister's statement (1990) that "strategy is an operational issue", the value chain has been reconstituted in operational terms. The aim has been to develop it as a tool for either formulating a new service operations strategy or for reviewing a strategy already in existence. Both approaches recognise the very real need to look for continual improvement. They result in the formulation of a new service strategy which may involve radical changes or again to quote Maister, simply be "adding pimples to the elephant".

The revised model for the value chain is shown in Figure 1 illustrating an intruder alarm company, which could be taken as being representative of many companies involved in customer service and support. The primary activities involved in the delivery of customer service and support are product design, installation, commissioning, monitoring of the equipment, service of the equipment and support of the customer. Each firm needs to define its own set of activities and typically there are 5 to 7 primary activities for any service organisation.

The main dimensions of service delivery relate firstly to the resources used, people, materials, equipment, facilities, and information systems and secondly the configuration of the resources both geographically and in relation to a front office back room mix. The resources identified are the those which are needed to carry out the task and associated activities.

This model for the value chain maps the resources against activities and shows the direct inter-relationship between the way in which value is built by way of the primary activities and the operational context of the service delivery. It is useful for assessing the service operations task ie "what has to be done well" in terms of "how well is it being done".

The value chain presented in this way gives a direct link between the service operations task and the main elements of service delivery which we see as comprising three main dimensions of a service delivery triangle, Figure 2:

- The *resources* used which are people, facilities, equipment, materials, information systems which are required for planning and control of capacity, materials, quality and resource productivity, and customer records.

- The *configuration* of the resources both in a geographical network and between "front office" and "back-room" activities. The network in typical service of branches and service outlets is viewed at a number of "levels", the network as a whole, a branch, a department, and an individual resource. A consideration of capacity needs to be considered at the different levels.

The distinction between front office and back room in the service context rests on the ability of the customer or client to see what is happening. Front office activities have this visibility, back room do not.

- The *service process flow* as seen from the customers view point which corresponds to the service blueprinting and service mapping approach. It is used to identify

where things do or can go wrong and make a judgement on the criticality of incidents for customer satisfaction.

4. Identifying Critical Areas of the Resource Activity Map

4.1 Where is the "perceived value added" and where is the "cost"?

The value chain as constituted for the intruder alarm company can be used to identify the contribution made at each stage by the different resources to meeting the demands of the service operations task which in turn will deliver the perceived added value at the required cost. The first phase of the approach addresses the following questions:

* Where is the value added?

* Where is the competitive advantage?

* Where are the main costs?

It is necessary to adopt a stage by stage approach.

Stage: 1

The first stage is to map the resources which are required to do the job as it stands. The result of this for the alarm company is shown in Figure 1.

In constructing the initial resource activity map it may be possible to identify gaps and opportunities which may be important to enhance its operation and which need to be investigates at a later stage.

Stage: 2

The second stage considers the use of the main resources at each stage to deliver the aspects of customer service which contribute to *perceived* added and give differentiation. The customer service dimensions are contained in the service operations task in terms of critical customer service dimensions and sensitive hygiene customer service dimensions. These are shown for the intruder alarm company in Figure 3. The critical customer service dimensions which are given weighting (up to total weighting of 100) are considered to contribute to perceived added value. The hygiene customer service dimensions, given a weighting of zero, are those dimensions of customer service which a customer would expect to be present within this type of service. However, hygiene customer service dimensions provide no positive differentiation. On the other hand some hygiene factors such as those shown in Figure 3 are considered to be particularly sensitive to producing negative differentiation if they are not consistently delivered.

The points in the resource activity map which are considered to contribute most to the critical customer service dimensions which have been identified. These points are indicated by the asterisks in Figure 4. In the example they are associated mainly with people and having a good local base.

Stage: 3

The third question to address relates to where the main costs lie. These are shown in Figure 4 by "C". It can be seen that not all of the major costs are associated with delivering perceived added value. However the costs associated with the central monitoring station align with a contribution to the satisfaction of the hygiene customer service of satisfying a target response time.

The resource activity map makes it very easy to identify the main resource costs drivers at each stage in the chain. It is also possible in the exercise to quantify the costs at each stage at least in relative terms if not absolutely. The use of activity based costing techniques assist in this process.

As well as viewing the matrix as a discrete set of boxes it is possible to identify the linkages between different boxes which enhance the strength of the whole service delivery, representing the whole being greater than the sum of the parts.

Stage: 4

The main cost and revenue streams can be identified for each of the primary activities in the value chain.

4.2 Are there enhancements to service delivery?

The matrix which characterises the current state can be analysed for ways to enhance performance in two main ways. First to identify if existing resources need to be developed in order to realise the needs of the customer service dimensions.

Second,by substituting resources at various stages to gain competitive strength,- i.e.can money be spent in one area which will reduce the resources in another with an overall benefit. For instance, the intruder alarm company, Figure 5, could enhance its remote sensing of equipment to include remote reset which would reduce demand on the service engineers. This would save engineers and costs and some of this saving could be invested in more professional engineers capable of supporting the customer as much as servicing equipment.

Third can linkages between resources and stages be more effective. For instance an enhanced information system for customers' service history would allow more effective inventory management improving inventory service to ensure first time fix and time to repair capability by coordinating the flow of parts to arrive with the service engineers. Inventory costs could also be reduced. A better link between design and servicing would increase the reliability of the product over its lifetime. Linkage between the design for lifetime costs and preventive maintenance would increase the ability to deliver on the important customer service dimension of product reliability.

The process being followed is to take the resource model and try to examine ways in which causal ambiguity can be increased. While the components of tacitness, complexity and specificity do not as yet have any quantifiable measures they are still useful concepts for addressing one of the main drivers of barriers to imitation.

5. The workshop approach to service operations strategy

While the re-definition of Porter's value chain might seem to be marginal at a conceptual level it has been found that the new presentation has dramatically improved the value chain concept as a tool for use in the formulation of service operations strategy within service organisations. It has been incorporated into a workshop approach for the formulation of service strategy and improving service delivery (Clark and Armistead 1991).

The workshop process works with either managers at essentially the same level who are concerned with the delivery of the different stages of the value chain or with groups taken from a diagonal slice through the organisation, including representatives from front line roles. The main stages in an initial review of service strategy and service delivery capability are the following:

- Setting the general direction of service strategy for the main service offerings in terms of the perceived added value and price.

- Defining the service operations task for each service

- Establishing the resource activity map for each service, asking the questions:

* What are the main resources being used in the value chain?

* Where are the critical customer service dimensions delivered?

* Where are most of the costs?

* What are the strengths and weaknesses of the service delivery system? Where are the gaps or where should resources simply be developed?

* In what ways could service delivery be enhanced? Questioning the use of resources to gain greater competitive advantage in the directions of movement aimed for in the service strategy. Where are there opportunities to increase the value added and decrease the costs? Is it possible to substitute resources? The process involves asking questions which related to enhancing causal ambiguity.

- Characterising the service delivery system in terms of the resources, the service process flow and the configuration.

6. The benefits of the resource activity mapping in service operations strategy

The benefits from the use of the resource activity mapping in the workshop method are:

- The technique is readily understood by operational managers and staff in service organisations.

- It presents the build of value in a way which "fits" the organisation under consideration without the organisations being "shoe horned" into the model.

- It allows the "language" of the organisation to be used in the description and discussion.

- It provides a powerful link between the service strategy and the service operations task and the definition of the service delivery system.

- It acts as a means of communicating how things work in service delivery

7. Conclusions

The creation of the value chain as a resource activity map in an operational mode gives a tool for examining the current performance of service delivery. It addresses the factors which give reality to the concept of ambiguity and it shows related costs. It is a useful technique which allows the presentation of the whole service delivery in a way which transcends functional boundaries and forces "end to end" assessment of service delivery. The new model can be used in a workshops to develop service strategy, and improve service delivery.

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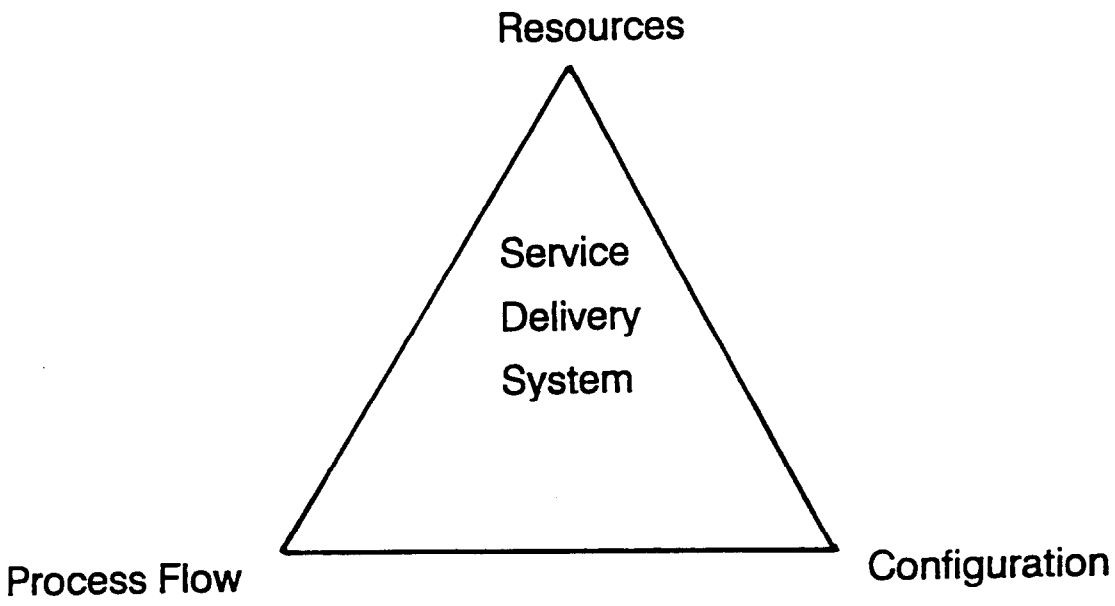
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	DESIGN	INSTALLATION	COMMISSIONING	MONITORING	SERVICE	SUPPORT
	Central Spec Key Accounts Consultants	Own Staff	Own Staff Customer Training		Own Staff Training Local Manager	Continuity Expertise Upgradability Customer Retraining
				Central Station	Local Base	Local Base Advice /Telephone line
	Sales Order Processing Availability Systems	Design	Documentation		Customer Records	
		Centralised Stores			Local Stores Van Kits Central Store	Upgrades
ıt			"Training Board"			
ıtion	Key Accounts	Local Team Major Project Flexibility	Local Team Inst/S.E. Handover	Coverage	Area Coverage 24 hr Availability	24 Hr Monitoring

Figure 1



Service Delivery Triangle

Figure 2

Customer Service Dimensions

Intruder Alarm Company

Product	
Reliability	40
Installability	'H'
Price	5
Service	
4 Hour Response	'H'
First Time Fix	20
Routine Maintenance	'H'
Support	
Customer Training	10
Documentation	10
Process	
Access to Staff	'H'
Customer Records	'H'
Staff Attitudes	15
	100

Figure 3

	DESIGN	INSTALLATION	COMMISSIONING	MONITORING	SERVICE	SUPPORT
	Central Spec Key Accounts Consultants	Own Staff	Own Staff Customer Training		Own Staff Training Local Manager	Continuity Expertise Upgradability Customer Retraining
es				Central Station	Local Base	Local Base Advice /Telephone line
ı	Sales Order Processing Availability Systems	Design	Documentation		Customer Records	
als		Centralised Stores			Local Stores Van Kits Central Store	Upgrades
ment			"Training Board"			
guration	Key Accounts	Local Team Major Project Flexibility	Local Team Inst/S.E. Handover	Coverage	Area Coverage 24 hr Availability	24 Hr Monitoring
ıue		††††		†	††††	
	†	††	†	††	†††	†

Figure 4

	DESIGN	INSTALLATION	COMISSIONING	MONITORING	SERVICE	SUPPORT
ıle	Central Spec Key Accounts Consultants	Own Staff	Own Staff Customer Training (*"Walkthrough"*)		Own Staff (*Long Service*) Training Local Manager	Continuity Expertise Upgradability Customer Retraining
ities				Central Station	Local Base (*Despatching*) (*Work Planning*)	Local Base Advice /Telephone line
System	Sales Order Processing Availability Systems	(*Work planning*) Design	Documentation	(*Predictive*) (*Maintenance*)	Customer Records (*Stock Available*) (*RMI*)	(*Records*) (*Reliability*)
rials	(*Links with Manuf.*) (*Design for*) (*lifetime costs*)	Centralised Stores			Local Stores Van Kits Central Store	Upgrades
ıment	(*CAD*)		"Training Board"	(*Remote Reset*)	(*Radios*)	
guration	Key Accounts	Local Team Major Project Flexibility	Local Team Inst/S.E. Handover	Coverage	Area Coverage 24 hr Availability	24 Hr Monitoring
ıue						

Figure 5

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