Working across the Value Chain:

Understanding the Challenges

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1. INTRODUCTION

Since its commencement in 1996, the Society of British Aerospace Companies’ Competitiveness Challenge initiative has assisted companies throughout the UK aerospace industry to reduce costs, improve delivery performance, enhance quality and improve supplier relationships, leading to sustained and radical business improvement through the execution of Lean techniques and SCRIA principles.

Yet despite best efforts the majority of these initiatives have been company-centric, each a discrete example of good practice but bounded within one organisation, disconnected from similar examples of good practice in other organisations across the industry. As a consequence, the net effect on value added for the ultimate customer may in many cases be negligible, since the benefit of good practice in one part of the supply chain is not generally matched by similar levels of performance across the whole supply chain for a given product.

The analogy we have used to describe this phenomenon is that of a number of primus stoves each burning brightly but completely separate from one another. It is very hard to feel the benefit from a single stove unless one is very close to it. However, if the performance improvement activities could somehow be connected the benefits would be much more evident.

This paper seeks to explore the emergence of inter-organisational collaboration as an important topic, to examine the likely form and function of reconfigured / realigned supply networks and to provide a case study of an early attempt to create a collaborative supply network based on Value Chain concepts.

Collaborative Networks

The notion of organisations evolving from a company-centric position, toward one in which they actively seek to collaborate with other organisations in the reduction of waste and the increase of customer value across the supply chain for a given product, has emerged in many industries and in the academic literature.\(^1\)

To understand why, Möller\textsuperscript{2} proposes that a major driver is the increasing externalisation of value activities by corporations.

Möller observes that organisations are increasingly seeking to offer systemic product or service solutions in response to their customers' needs. The trend is therefore to provide a complete, packaged solution, rather than just one or two elements of the solution.

In the Aerospace Sector, a high profile example was the race to be awarded the engineering and manufacturing development contract for the Joint Strike Fighter (JSF) aircraft for the U.S. and its allies.

The development phase of the JSF programme alone is estimated to be worth in the region of $24 billion, with the production phase currently forecast to manufacture 3,000 aircraft. In October 2001 this prestigious and lucrative contract was awarded to the Lockheed Martin Company and their F-35 JSF aircraft, over their competitors at Boeing.

This was not however a simple battle between two companies. Underpinning both the Lockheed Martin and Boeing bids were collaborations with many major aerospace corporations, who lined up behind either the Lockheed Martin or the Boeing bid.

Each supplier applied their knowledge and resources in the pursuit of success for the bid they were backing, fully comprehending that success would result in long-term supply contracts for those who had participated, but exclusion from these contracts if their preferred bid finished second. This was therefore competition centred on two networks of collaborating organisations, rather than competition simply between two companies.

To illustrate, the major sub-assembly and module build up partners for the Lockheed Martin JSF are BAE SYSTEMS and Northrop Grumman. On propulsion, Pratt & Whitney will provide the main system, the F135, with a Rolls-Royce designed and developed lift system. Furthermore, Pratt & Whitney are also working with arch-rival

\textsuperscript{2} Kristian Möller & ValueNet Group, Helsinki School of Economics
GE to ensure common hardware compatibility over all three versions of the F-35 JSF aircraft.³

With the JSF, the U.S. and its allies sought from Lockheed Martin and Boeing a complete solution to their requirement for a single fighter aircraft, but with variants to operate in a variety of scenarios, including from carriers and vertical take-off and landing capability (VTOL).

The complexity of the requirement, VTOL, stealth technology, etc., necessitated expertise in multiple technological platforms and it was never likely that the necessary technological capabilities would be found in a single company, as each technology is highly specialised and becoming increasingly intense as the technology evolves.

In response to increasing technological specialisation and knowledge intensity, corporations have typically sought to focus on a narrow band of core competence, where they may maximise value-added activity within a finite R&D budget. Less value-adding activities are consequently outsourced to external providers and while benefits are gained from the increased degree of specialisation, breadth of expertise is also lost from the organisation.

Consequently, we find customers seeking broad, systemic offerings while suppliers are moving in the opposite direction and becoming increasingly specialist. A vacuum is therefore present to be filled by organisations that can build strong supplier relationships, bring together a wide range of specialist providers in the form of a supply chain network and develop a systemic offering.

It was in this way that Lockheed Martin collaborated with BAE SYSTEMS, Northrop Grumman, Pratt & Whitney, et al., each partner bringing specialist resources and knowledge, to be amalgamated by Lockheed Martin to form the F-35 JSF bid.

There is a significant danger in accepting the JSF project as empirical evidence of successful supply chain collaboration in the Aerospace Sector however. The JSF project certainly does represent an example of collaborative design, marketing and commercial application, but it is quite possible that once the project moves into its

³ Flight International 11-17 December 2001 pp26-32. F-35 All Aboard
production phase, company-centric supply chain precepts such as vantage point and customer superiority\(^4\) may re-emerge.

**The Report of the Aerospace Innovation & Growth Team**

The 2003 report of the UK Government sponsored Aerospace Innovation and Growth Team (AeIGT), which established a 20-year vision for the industry, acknowledged this trend towards supplier networks and asserted that future competition within the UK aerospace industry will increasingly move towards *value chain* competing against *value chain*, rather than company versus company.

The nature of UKAI 2022 will have changed considerably, driven primarily by globalisation. The business model of the future will be *value chain* competing against *value chain*, not just single company versus single company as we witness predominantly today. *Supply chains* will have evolved to include the end-user or consumer in value creation and through this will have become known as *value chains*.\(^5\)

The vision established by the AeIGT is for the UK aerospace industry to evolve into *totally connected multi-tier value chains* comprising different groups of companies as extended enterprises, which would be *focused upon providing the best value for a particular customer, programme or market segment*.\(^6\)

Since the AeIGT Report specifically highlights the importance of *Value Chains* to the industry, it is important to clearly differentiate Value Chains from existing Supply Chains.

**Value Chain versus Supply Chain**

Brandt (1998)\(^7\) identified that Value Chains focus on the whole production process regardless of ownership, they include all customers at all levels and within a Value

\(^6\) Ibid.
\(^7\) Brandt, J. 1998. Beyond the Supply Chain. *Industry Week*. 

Chain, the partners insist on visibility and transparency. Supply Chain Management (SCM) precepts of vantage point and customer superiority therefore appear to contrast with Value Chain concepts of collaboration and transparency in much the same way as they did with Lean Supply (Lamming, 1996)\(^8\).

As with SCM there appears to be some ambiguity around Value Chain Management (VCM) terms and meanings and also similar is the limited evidence of the development of accompanying theory in the literature\(^9\). A common theme in the VCM literature is however the concept that VCM is a co-ordinating management process in which a firm and their suppliers maximise customer satisfaction (Dumond, 2000; Svensson, 2003; Walters & Lancaster, 2000).

Walters and Lancaster (2000)\(^10\) offer a hierarchy between VCM, SCM and Logistics. By their definition, VCM is the design for the business mission, SCM offers strategic direction and manages interface relationships and Logistics is concerned with managing operations / implementation. Using this classification, VCM does not supplant SCM in any way. VCM is the dedication of the business mission to improve competitive advantage through the realignment of all other management activities to meet the value demands of the consumer (Svensson, 2003)\(^11\).

Of key importance here is the recognition that the Value Chain model is therefore not a tool for identifying value, because value can only be defined in the final consumer market.

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Also implicit in the Value Chain concept is the notion of organisations working together to co-produce value. Whereas in SCM organisations see themselves as independent entities in a chain, separate from customers, suppliers and other external stakeholders, the task within VCM appears to be one of reconfiguring relationships to enable the creation of value in new forms (Dumond, 2000).

What appears to be unclear at present is the form that such reconfigured relationships or realigned management activities might take, how they would come about, how they would function and the dynamics of their operation.

Al-Mudimigh et al, Svensson and Dumond all offer taxonomies for Value Chains, but offer no clues as to how reconfigured / realigned organisations working together to co-produce value might be co-ordinated, how their decision processes might work, where the locus of control might lie, what part organisational cultures might play and the importance of dominant cultures, how strategy might be deployed and so on.

Likewise, the structure of the emerging inter-organisational forms and their communal ethos will challenge existing business principles and attitudes, for example to competition and the sharing of information, so the path of the transformation from company-centric to collaborative functioning is also yet to be defined.

This report attempts to explore the challenges implicit in the implementation of value chains as the proposed future inter-organisational business model for UK Aerospace.
2. THE IDEAL TYPE CONSTRUCT

Reconfigured / realigned supply networks or Value Chains, offer the potential for a new wave of productivity improvement throughout the supply chain, resulting from inter-company collaboration on waste reduction and a greater focus on value creation for the end customer, yet the likely form and function of this new inter-organisational business model is, as yet, unclear.

Since we are seeking to understand the likely form and function of a new business model, which we cannot as yet examine in reality, we have developed an *Ideal Type Construct*\(^\text{12}\) of a Value Chain’s probable characteristics.

What the Ideal Type allows us to do is imagine what we would find if we were able to investigate a hypothetical organisation that was participating as part of a value chain. We can then conjecture on the characteristics and behaviours that we would find in an *ideal state* and document these.

Max Weber (1864 – 1920) who developed the Ideal Type technique was a German sociologist and one of the founders of modern sociology. He emphasised cultural and political factors as key influences on economic development and individual behaviour.

Weber’s Ideal Type serves as a heuristic device developed for methodological purposes in the analysis of social phenomena. An Ideal Type is constructed from elements and characteristics of the phenomena under investigation, but it is not intended to correspond to all of the characteristics of any one case. In reality therefore, one may never find all the elements of the Ideal Type present in any real comparison.

An ideal type is therefore a sort of composite picture that all the cases of a particular phenomenon can be compared with\(^\text{13}\).


\(^{13}\) Coser, 1977: 223 - 224
For the purposes of our research, we constructed an ideal of the characteristics we might find in an organisation operating within a value chain. We then used this to compare the ideal to reality and formulate a view on what actions organisations might take to make the transformation from company-centric to working as a value chain.

The Research Process

We invited a wide range of organisations from the aerospace industry to participate in a series of facilitated workshops, each designed to identify the characteristics of Ideal Type.

Organisations invited to take part in the workshops included a range of aerospace companies, trade organisations, consultancy groups and academics.

- Smiths Aerospace
- Industry Forum
- BAE SYSTEMS
- The West of England Aerospace Forum
- The Society of British Aerospace Companies
- Sigma Management Development
- Airbus
- Westland Helicopters
- Rolls-Royce
- University of Bath
- Cranfield University

Participants at each workshop were asked to consider what characteristics would ideally be present if an organisation was part of a value chain and embracing the principles of Lean and SCRIA from the SBAC’s Competitiveness Challenge (since these principles are seen as the bedrock of existing good practice in the industry).

The participants individually noted their thoughts onto post-it notes and these were subsequently all placed on a blank wall.
The participants were then asked to arrange the post-it notes, each representing one thought or *data point*, into groups of what they considered to be similar topics. This was done silently to avoid discussion of the groupings at this point in the process.

Once the groupings had been established, a facilitated discussion took place to assign an agreed category heading to each of the groups. During these discussions data points would often be reassigned to other groups as the participants gained clarity of thought.

Figure 1 shows an example of a number of data points arranged under six category headings. In this example, the final column has two category headings as the participants identified two closely related category topics from one group of data points.

In total, the workshops generated 632 individual data points grouped under 47 category headings.

On completion of the workshops, the data from each session was further analysed to identify any possible additional category headings. The data was also correlated against the Lean and SCRIA principles to gauge whether the category headings sufficiently encompassed all of the principles.

The final stage in the process was to regroup the 47 category headings into related topics. We then labelled these groups giving us six main headings for the Ideal Type and used the original category headings as sub-topics, editing and amending these where necessary for clarity.
FIGURE 1. Example data points grouped by topic

<table>
<thead>
<tr>
<th>COMMON GOALS</th>
<th>COMMON STRATEGY</th>
<th>ALL PARTIES TO BE INVOLVED IN THE DESIGN PHASE</th>
<th>JOINT APPROACH TO ORDER WINNING</th>
<th>COMPETE AS A VALUE CHAIN</th>
</tr>
</thead>
<tbody>
<tr>
<td>2nd Order Strategy</td>
<td>Rewards &amp; Recognition align To Customers Perception of value</td>
<td>All committed to Achieving end Customer Requirement.</td>
<td>Individual’s R&amp;R Based on value Chain performance</td>
<td>All employees Understand &amp; support Principles of waste Elimination and open/ Honest communication Across infill chain</td>
</tr>
<tr>
<td>Aim to win Business agreed – For a particular bid / product</td>
<td>Responsive &amp; Resilient to Customer changes Of requirement and Messed about Unnecessarily</td>
<td>End customer Strategies &amp; Practices aligned With value Chain practices</td>
<td>Value chain Success Critical to Both sides</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Concurrent Homogeneous rather Than sequential &amp; Heterogeneous – Not obvious where you Are in value chain</td>
<td>Collaborate at The earliest Stages of a project</td>
<td>Customer Commercial Practices support ‘Lean’ operation</td>
<td></td>
</tr>
<tr>
<td></td>
<td>People are Both skilled &amp; Aware of vision</td>
<td>EDUCATION &amp; TRAINING</td>
<td>Competency issues discussed &amp; openly, honestly Resolved across Value chain</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Commercial Framework which Supports competing As a Lean Value chain</td>
<td>Comms across Value chain – Same messages</td>
<td>All members of value Chain are skilled at Analysis techniques of QCD &amp; in selection &amp; Use Of improvement techniques</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>REGULAR BUSINESS REVIEWS</td>
<td>Develop the Appropriate Skills</td>
<td>Interaction Between Functions within The value chain</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>PARTNERSHIPS</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Co-operation</td>
</tr>
</tbody>
</table>
Outline of the Alpha Version

The result of the workshops and subsequent data analysis was the development of an alpha version of a Value Chain Ideal Type construct. The model has six main categories:

- Defined Customer Value
- Cross-functional / cross-organisational connectivity
- Leadership
- Process excellence in value delivery
- Effective business relationships
- Enabling infrastructure

Figure 2. The Ideal Type – Alpha Version

Before examining the content under each of these headings, it is worth restating the purpose and limitations of the model. First, the Ideal Type is a tool to help visualise what characteristics and behaviours an organisation would have if participating as part of a value chain network.
The Ideal Type does not require all the characteristics and behaviours to be present in a real life example, but it gives us a heuristic or ‘rule of thumb’ that we may use for purposes of comparison.

The Ideal Type detailed here is an alpha version and in practice over time, we may need to include other category headings and/or sub-topics.

In describing the elements of the Ideal Type in the paragraphs below, we frequently refer to the ideal characteristics of a participating organisation within a value chain. It should be noted however, that the characteristics should also be read as applying to the value chain as an entire entity since the value chain is the product of the participating organisations.

**Defined Customer Value**

The first category, *Defined Customer Value*, suggests that within an ideal value chain network the participants would have carefully defined the nature of value to the customer and would be aligned in order to achieve it.

This would be evident for example, in that the ideal value chain participant would actively seek collaboration with suppliers and customers at the earliest and all subsequent stages of product innovation and new product introduction.

Likewise, they would be alert to changes in the customer’s definition of value and would respond, forming and renewing partnerships in line with these changes and the evolving product life cycle.

Other observable characteristics would be that the participant would seek to offer the customer a systemic product offering rather than satisfying elements of the customer’s need, and would achieve customer satisfaction on quality, delivery and cost, particularly minimising transaction costs.
Cross-functional / Organisational Connectivity

The principle of connectivity between organisations and across functions is central to the concept of value chain networks. The Ideal Type suggests that there would be two observable characteristics of connectivity.

First the clear perception of connectivity, whereby the value chain would have the creation of cross-functional and cross-organisational connectivity as a priority, in which there would be mutual responsibility for problem resolution between the parties in the value chain and the intention to make all stakeholders in the value chain aware of and responsible for maintaining connectivity.

It should be noted that in transitioning from the currently predominant company-centric basis of competition to competing within value chains, organisations will inevitably face many significant obstacles to connectivity. The Ideal Type suggests that a step change in the mindset of those participating within the context of a value chain would be the acceptance of mutual problem solving with other parties, rather than abstinence from responsibility and a reliance on others to provide solutions.
Secondly, the characteristic of connectivity would be manifested in the preparedness to take action to address and resolve the obstacles to connectivity in all forms. Typical obstacles to connectivity may include misguided optimisation, whereby objectives are set within parts of the organisation that run contrary to the requirements of optimal connectivity, silo mentality in which individuals or teams operate with an attachment to an entity (department or functional area) at odds with the priority of connectivity, or conflicting corporate objectives running counter to the objectives of the value chain network.

**Leadership**

In order to achieve the ideal state in which connectivity is prioritised and obstacles to connectivity are negated, *leadership* would be paramount. The construct suggests that within the Ideal Type organisation it would be possible to observe two aspects of leadership.

When conceptualising a value chain network people most often begin to define it as an entity that has a shared mindset or sense of shared destiny. The Ideal Type construct suggests that while this is essential, leadership would extend beyond the development of perceptions of shared destiny to address tangible exhibits such as shared goals, strategies and performance targets, in addition to a commitment to new ways of working, including the sharing of risks and benefits.
The second characteristic of leadership would be transparency within the value chain, not solely the sharing of information but also the visibility of the route to market. For example, if an organisation was an ideal transparent customer it would be possible for a supplier to understand how their product, process or service forms part of not only their customer’s product, but also the next customer along the value chain in turn, up to and including the end market.

Visibility of the entire value chain along the route to market is highly desirable as it facilitates both product and process innovation, stemming from a greater understanding of value definition along the value chain.

As an illustration of this point, a manufacturer of tape back-up devices for network servers built into their product a facility for status diagnosis via a series of LED’s. When the manufacturer was given visibility of the end use of the product, it revealed that the tapes in the units were most often changed by janitors or security operatives during the early hours. Far from being an aid to diagnosis, the LED display was more often a cause of concern and anxiety. The manufacturer suggested changes to the producer of the network servers to which the back devices were fitted and the LED’s
were discontinued, reducing cost, manufacturing lead time and improving end user satisfaction.

**Process Excellence in Value Delivery**

Within the Ideal Type construct this category is the most directly attributable to the principles of Lean. Within an organisation functioning within a value chain an emphasis on delivering value through *process excellence* would be observable.

**Figure 6.**

The Ideal Type asserts that common and agreed measures would be one facet of this characteristic, in which targets would be clearly stated along the value chain and a system of performance feedback would be in place. However, measurement would not be limited to financial and manufacturing measures as is currently common but would take a *Balanced Scorecard* ¹⁴ approach, utilising a broad range of measures across the value chain to build capabilities and drive performance toward the desired goals.

The second characteristic of this category is management. Since continuous improvement activities are generally designed to improve a supplier's overall capability and are often disconnected from one another (i.e. 'primus stoves'), many organisations report that such activities deliver only isolated and/or unsustainable improvement.

A characteristic of the Ideal Type is that continuous improvement activity would be targeted improvement, i.e. it would be targeted at delivering specific improvements for a particular product value stream. A low level of generic supplier improvement may continue to be necessary to equip some suppliers with the basic tools and techniques of process improvement, however once so equipped further improvement activity would be collaborative and solely designed to achieve targeted improvements within a specific value chain.

In accordance with Lean principles, it would be a characteristic of the Ideal Type for there to be robust processes across all activities, not limited to manufacturing activity only and particular observance to the principles of flow and pull. Supporting these would be financial tools which would be utilised, for example, to establish and attain target costs. Consequently, management accounting would be actively aligned to achieve the goals of the value chain.

Effective Business Relationships

Insofar as the previous category is the most directly attributable to the principles of Lean, the Effective Business Relationships category is the most closely related to SCRIA's principles. However the Ideal Type also asserts that good relationships are contingent upon there being a positive value proposition for both parties and that the relationship would be characteristically commercially robust.

The Ideal Type recognises that trust and openness would be essential characteristics without which any organisational network would be short lived. Consequently, mutual commitment to recognised ethical behaviour would be observable within the Ideal Type.

Relationships between parties, whether inter-organisational, cross functional or between individuals, are beginning to be understood as processes rather than being
seen as entities. Like any process relationships need to be focussed on a desired outcome and once decided upon, the appropriate relationship can be established.\textsuperscript{15}

As a result, the Ideal Type proposes that for the value chain to exist as an effective entity the participants would see the value chains as a positive value proposition and evidently preferable to competing within a traditional company versus company framework. There would therefore be willing buy-in to value chain competition.

**Figure 7.**

![Diagram showing effective business relationships]

- **INTEGRITY**
  - Ethical behaviour
  - Openness & trust
  - Mutual commitment

- **ADDED VALUE**
  - Willing buy in
  - Positive value proposition
  - Each organisation has defined competencies
  - Each organisation has awareness of the value added by the other

- **COMMERCiALLY ROBUST**
  - Margin / profit preservation & realisation
  - Economically viable
  - IPR demarcation
  - Benefits linked to risks
  - Target costing to protect margins

Facilitating this would be a clear appreciation of the participant’s own competencies and those of the other participants, through which it would be possible to perceive and favourably contrast the value added by the value chain network over the traditional approach to competition.

In order for the contrast to be favourable and therefore enticing for the participants, the value chain would need to be characteristically commercially robust, i.e. economically viable, realising and maintaining acceptable levels of return and

offering benefits in accord with each participant’s investment and commercial risk. Within the Ideal Type it would therefore be possible to observe target costing being used as a means to protect profit margins for example, or other approaches being utilised to protect and preserve participants’ benefits, including intellectual property rights.

However they may be manifest, the key characteristics suggested by the Ideal Type are of adherence to a core of ethical principles, guiding the behaviour of participants willingly networked having comprehended the advantages and operating within a commercially robust and equitable framework.

**Enabling Infrastructure**

The final set of characteristics for the Ideal Type is concerned with the human, communication and organisational *infrastructure* to facilitate the running of the value chain network.

The actors engaged in the Ideal Type value chain would have a clear perception of the flow of the value chain through their organisation and through their own activities, and would be empowered to optimise the flow of the value chain having been equipped with the necessary skills, by having access to all necessary information and by the alignment of their personal goals and rewards with the aims of the value chain.

In addition, as the product life cycle progresses and the value chain adapts and evolves in line with changes in the definition of customer value, a characteristic of the Ideal Type would be close attention to workforce planning, through which the future skill and manpower requirements of the value chain would be assessed and prepared for.

At an organisational level, the Ideal Type would exhibit an organisational design appropriate to the needs of the value chain. Within an organisation this could mean, for example, realigning the organisation away from traditional functional design (i.e. Accounts, R&D, Human Resources, etc) toward a matrix organisation focussed on cross-functional alignment for each value chain.

At an inter-organisational level, the participants of the Ideal Type value chain would aim to achieve a seamless flow along the value chain, minimising any disturbance to
the flow as it passes from one organisation to another. In order to achieve this, roles and responsibilities, IT infrastructure and partnering strategies would all be aligned, within a supporting commercial framework.

**Figure 8.**

![Diagram of Infrastructure Components](image)

**ENABLING INFRASTRUCTURE**

**HUMAN INFRASTRUCTURE**
- Skills
- Knowledge management
- Perception
- Training & development
- Values
- Workforce planning
- Rewards & performance measurement

**ORGANISATIONAL INFRASTRUCTURE**
- Supporting commercial framework
- Organisational design
- Roles & responsibilities
- Enabling IT infrastructure
- Aligned functional strategies

**COMMUNICATION INFRASTRUCTURE**
- A forum for communication
- Technology as an enabler of communication
- Common language for communication
- Identification of contacts
- PDCA loops

Finally, communication upstream and downstream along the value chain would be a key identifying characteristic of the Ideal Type, and the participants in the value chain would establish and utilise a forum for sharing information and problem solving.

Technology could be employed as an enabler of communication in the form of websites for sharing knowledge for example, or more simply, via regular teleconferences with all the participants in the value chain. There are many current tools available to assist with needs identification and the development of a technology driven communication infrastructure, such as the Practical E-Business Leadership Programme from the UK Council for Electronic Business.

However, for the technology to be used effectively the participants would first need to identify and maintain a list of contacts along the value chain, agree to use common
terminology to minimise ambiguity in communication and establish effective PDCA loops for reviewing performance.

In a value chain with only a few locally based participants it may not be necessary to employ a sophisticated technological solution at all, however an up-to-date framework for communication, problem solving and performance review would be no less a characteristic of the Ideal Type.
3. CHALLENGES IN ESTABLISHING VALUE CHAIN WORKING

In the following section we examine how the Ideal Type was deployed within a pilot study of value chain working involving Smiths Aerospace and Airbus.

When the AelGT implementation phase commenced in August 2003 it established five working groups tasked with implementing the recommendations made within the June 2003 report. The working groups, each chaired by a senior industry figure, subsequently developed implementation plans to address specialist themes:

- Technology – Working Group 1
- Process Excellence – Working Group 2
- Skills & People Management – Working Group 3
- Socio-Economic Environment – Working Group 4 (Plus a sub-Finance Group)
- Safety, Security and the Environment – Working Group 5

The goal for the Process Excellence Working Group was to establish practices that would enable the UK Aerospace sector to ‘systematically and continuously deliver productivity improvement at a rate faster than its competitors’. There were four key elements to achieving this goal; exploitation of existing initiatives, creation of a Directory of Learning, improving workforce skills and the establishment of three pilots.

The pan-industry pilots were intended to identify best practice, create case studies for the Directory of Learning and to act as a catalyst for the industry by demonstrating the potential for step change improvements. Each pilot would therefore inherently deliver both real-time business improvements for participants and identify generic lessons for industry wide application.

This provided us with an opportunity to deploy the Ideal Type framework to assist with the first of the pilots, which was a collaboration between Smiths Aerospace, Smith’s supply chain and the customer, Airbus, focussing on meeting Airbus’ Route 06 initiative objectives on quality, cost and delivery within the manufacturing supply chain for the A318/319/320 Fuel Quantity Indication System (FQIS). These were:

- 15% price reduction
- Optional equipment lead time of 2 months (from 6 months)
- 99.7% on time delivery
- < 0.1% rejection rate

The Pilot Project

The pilot project embarked on a structured sequence of process improvement activity, with the intent of engaging the key stakeholders within the supply chain, particularly Airbus. The simplified sequence of intended activities for the pilot was as follows:\ref{17}:

- Identify the Target Value Chain
- Define the ‘As Is’
- Develop the ‘To Be’
- Implementation
- Dissemination

Part of the initial phase of the project sequence ('Define the As Is’) had involved the practitioners in mapping the value stream for the FQIS, following the flow of value across the supply chain from Smiths’ component suppliers, through Smiths’ own manufacturing process and on to the various delivery points and stakeholders within Airbus (Figure 9).

The map was subsequently reworked to two further levels of detail.

\ref{17} Brook, J. Working Group 2, Pilot 1 Lead AeiGT / Smiths Aerospace
The practice of mapping the value chain was a useful exercise in that it provided the project participants with greater insight into how value was created in the FQIS manufacturing supply chain and by whom. The map also provided a common tool for discussion of each stakeholder’s needs and the problems that arose as a consequence of the way in which the processes were organised.

As a result, the mapping activity identified areas of sub-optimum performance including the inconsistent use of kits across the FQIS supply chain and significant waste and work-in-progress as a result of frequent schedule changes.

In February 2004 having mapped the value stream, the project team proceeded to employ the *Ideal Type* construct to identify key value chain connectivity issues, seeking to identify the means to make more effective progress and ensure the sustainability of the targeted process improvements (Figure 10).

The project team recognised that greater performance improvement gains were available by looking across the value stream as a whole and that to realise and sustain these benefits, ways had to be found to engage the other stakeholders in the process improvement activity. The *Ideal Type* provided a framework to identify which
factors were obstacles or enablers to creating collaborative process improvement activity along the product value stream.

**FIGURE 10**

Pilot 1 Issues 13<sup>th</sup> February ‘04

As an outcome of the *Ideal Type* mapping process, defining customer value, the enabling infrastructure and creating a positive value proposition emerged as three key issues.

**Defining Customer Value**

Within the pilot difficulties were apparent in the multiple and conflicting definitions of customer value. There were effectively four ‘customers’ within Airbus, each with its own definition of value.

For Airbus Procurement based at Filton the price of a commodity was the primary defining characteristic of value. At Filton Q&SCD and Broughton, quality and on-time delivery were primary, whilst in Toulouse product lead-time was most valued. Meanwhile, Airbus’ *Route 06* initiative established targets for quality, cost and delivery improvement across the board, without defining a set of relative priorities.

As a consequence, it was problematic for the pilot to establish with Airbus whether price reduction, quality improvement, lead-time or delivery performance should be the primary goal for initial process improvement activity.
Whilst it should be argued that the objective must be world-class competitiveness on quality, cost and delivery, a rational approach would be to establish a priority, attain that performance through targeted activity, ensure sustainability of the performance and focus on achieving the next priority target.

Lack of value definition consequently led to a lack of clarity of the objective for the pilot team and ultimately to a dilution of focus, since process improvement had to be tackled on all fronts simultaneously.

Similarly within Smiths Aerospace mixed messages on value were being given to their own suppliers. On the one hand the message was one of co-operation and collaboration on process improvement targeted for a specific value chain, on the other the Smiths procurement team launched an initiative requiring generic price reductions. The danger was that a supplier receiving both messages would be subsequently sceptical concerning Smiths’ commitment to collaborative process improvement.

The pilot achieved the cost reduction requirements of Route 06 and work is continuing on meeting the benchmark for quality and delivery performance. However the importance of clearly defining customer value at the outset of the improvement activities had been initially underestimated and remains a significant hazard for working effectively as a value chain. For example, indications suggest that the customer may value standardisation across a variety of products from one supplier, rather than improvements in one product.

**The Enabling Infrastructure**

The *Ideal Type* analysis also revealed the need for an appropriate infrastructure within the pilot organisations to enable effective value chain working.

For example, since both Smiths Aerospace and Airbus are functionally aligned organisations, the path of the product value stream through each organisation was complex and it was difficult to identify any one individual with responsibility for managing the whole value stream.
It was subsequently suggested that ideally, each organisation would have managers with responsibility for a number of specific product value streams and advancement was made in clarifying this role. The presence of Product Value Chain Managers would enable the Value Chain Manager from the supplier organisation to link with his/her appropriate counterpart in the customer organisation and vice versa, thereby ensuring the mutual ownership of issues and facilitating clear communication.

Within Smiths Aerospace progress was made in creating a visible cross-functional product value chain management team for FQIS, by gaining the participation of Supply Chain and Manufacturing management. A similar attempt within Airbus was less successful however, which perhaps alludes to the challenges of doing this across multiple sites and countries. Without such an infrastructure, it remains difficult to maintain the integrity and connectivity of the value chain.

As with definitions of customer value, enabling infrastructure issues had been underestimated prior to the Ideal Type analysis exercise and they remain a significant challenge.

**A Positive Value Proposition**

The third topic revealed by the ‘Ideal Type’ analysis of the FQIS pilot is the importance of being able to demonstrate to the stakeholders in the product value chain that participation in collaborative process improvement is a positive value proposition, i.e. in their own interest. Without clarity of this point it is otherwise extremely difficult to engage and sustain commitment to new ways of working.

Since the value proposition concept had not been considered in advance of the FQIS pilot, it was inherently difficult to engage Airbus in the concept of working collaboratively. This was not solely because of the difficulty of defining customer value, or because of the lack of an identifiable Value Chain Manager within the Airbus infrastructure, but also because there wasn’t a clear proposal that offered Airbus greater benefits than the status quo.

This consequently raises the question of whether a prerequisite for any future value chain pilot exercise is the pre-existence of an identifiable positive value proposition for all participants, especially the customer organisation.
One of the benefits of mapping the product value chain was the ability to identify where value added activities can be performed more effectively elsewhere in the value chain. However, since there may be winners and losers in any such realignment it would be prudent to identify, in advance, appropriate positive value strategies to ensure the continued buy-in of the supplier stakeholders most effected.
4. LESSONS IN VALUE CHAIN WORKING

The FQIS pilot demonstrated some of the potential benefits of adopting a product value stream perspective for collaborative process improvement. However, the challenges faced by the pilot in establishing value chain working demonstrate that the vision of value chain competition is not yet well articulated and the dynamics of organisational competence for operating in this way requires further exploration.

Consequently, an organisation embarking on a value chain strategy needs to understand that they will be working in the absence of a ‘blueprint’ and that further work in this area is critical for future success.

Some initial guidelines resulted from the FQIS pilot however:

- All parties must be willing to adapt and recognise that this a new business model that will require changes in current organisational practices

- New organisational roles may be necessary and these should be defined and agreed at the outset or as early as possible in the process

- Conflict with existing corporate objectives may be inevitable as the new business model is introduced and these conflicts must be resolved in favour of value chain priorities, otherwise the success of this fragile new form of working is unlikely against established traditional practices

- Whilst greater performance improvement gains are available by looking across the value stream as a whole, to realise and sustain these benefits the business model must be advantageous to all parties, i.e. there must be a clearly articulated, realisable value proposition in working as a value chain rather than optimising for an individual business.

- Value chains must learn to transition relationships across the product life cycle to ensure continuity of performance.
CONCLUSION

Connectivity is achieved when all players in a supply chain work together with a common strategy to create value for customers and end users.18

The lessons from the FQIS pilot contained within this report form only part of a proposed larger strategy of on-going investigation and reporting to industry. As such, this paper represents only a provisional appraisal of some of the challenges that will be further explored in future research.

This report has however demonstrated the use of the Ideal Type Value Chain Construct 19 as a tool for analysing the factors that need to be considered and put in place to establish effective value chain functioning. There is already some evidence of the usefulness of the Ideal Type in this regard, however further examples are required in order to test and develop the model.

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