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LEARNING FROM THE PROPOSAL PROCESS USED BY BUSINESSES TO SELL CUSTOMER SOLUTIONS

by

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Abstract:

This document presents a review of the practices and tools that are used in other (non-aerospace) industries, for the purpose of identifying best practices that might also be employed in the rapid generation of a proposal for aero engine products and services. Addressing the customer's perception of value, and its delivery process, this has implications for much of the activity conducted within Work Package 2.1.

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EXECUTIVE SUMMARY

VIVACE Task 2.1.3 aims to define the process requirements that will be needed for an extended enterprise to produce a customised proposal, detailing products and services, with a very short lead time. This is sometimes referred to as the 'Seven day proposal', taking its name from the ultimate goal of the work.

The technological complexity of aerospace systems, the complex business models surrounding the provision of goods and service in this sector, and the requirements for solutions to be certified have all delayed the development of tools to automate some of the tasks in proposal generation. However, by studying the approaches used in other industries, we can identify elements of the proposal generation approach that might be used by an aero engine prime.

This document (originally written in late 2004 and now made into a formal deliverable for the purposes of dissemination) describes the requirements upon an information model of the proposal generation process. It discusses options available to those seeking to create more responsive value chains, including approaches such as modular product (and service) architecture, the application of information technology to the proposal generation process and several forms of integration that can create added value. The applicability of these options to an aerospace context is discussed.

In the appendices, a review of the major literature in the area of rapid proposal generation is supported by an annotated bibliography of the sources.

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GLOSSARY OF TERMS

CRM	Customer Relationship Management.
Functional product	A package comprising physical product(s) and supporting services.
PC	Product Configurator; a software tool used to aid the quotation process for customised solutions
Seven-day proposal	Reduced lead-time response to a request for proposal, initiated by an operator. Sometimes abbreviated to 7DP.

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1. INTRODUCTION

Customers are becoming increasingly demanding across many markets (Jiao *et al*, 2003). Businesses in many sectors have found that they have needed to instigate changes in proposal processes because of the need to understand customer needs better and need to provide faster responses to customers. Some manufacturers have changed their business strategy to broaden their portfolio and offer customer solutions (e.g. Lucriat-Labry *et al*, 2002; Bramham *et al*, 2005).

We use the term 'customer solution' to refer to a broader product offering which is likely to include products and service offerings and is also likely to add additional product services to existing product offerings. We have adopted this term in this report because it appears to be generic across sectors. However it should be noted that within the aerospace industry reference is more commonly made to specific customer solutions such as 'power by the hour' or 'TotalCare'.

This report focuses on the activities business use to provide customer solutions. We refer to these businesses as 'solutions providers'. We have adopted a definition for solutions providers that has helped to scope our study of other sectors:

'Solutions providers ...create a new way for components to work together to enhance the solution's overall functionality beyond that of the next best alternative and also spare the customer from the need to deal with multitudes of suppliers to integrate components and services itself'

Roegner *et al* (2001).

We propose that this definition should form the target for the VIVACE work within WP2.1 in improving proposal processes because it focuses on integration that supports the underlying philosophy of collaboration within the VIVACE project.

The review of proposal processes seeks to address the following questions:

- ① Where are solutions providers emerging?
- ② What concepts are solutions providers using to sell solutions?
- ③ Which of these concepts are applicable to the aerospace market?

This review provides findings of the information technology and resources used by solutions providers in industrial markets. The report presents key questions that should be addressed in the development of the VIVACE information model for the proposal process. We pose these questions in the section 'Considerations for the VIVACE 7-day proposal information model'.

1.1 CONTEXT WITHIN THE VIVACE PROJECT

The VIVACE research that has been working to define future business environments highlighted that a future business scenario could be characterised by an increase in the product variety offered by aerospace manufacturers (Bramham *et al*, 2004 p. 86). Product variety is often driven by customer demand for products that are customised to their needs. This is likely to be realised through the growth of solutions that include

service offerings. One example of this is the 'TotalCare' strategy adopted by Rolls-Royce (e.g. Anon, 2002). 'System integrator' is another term that is frequently used in the aerospace industry to describe a prime manufacturer that consolidates product offerings to provide a customer solution (Mecham, 2004).

A fundamental step in providing solutions in the aerospace industry is to present the customer with a proposal of what a customer solution would entail. The processes that are used to prepare this proposal are the focus of the work within VIVACE Task 2.1.3. This deliverable has been offered as a discussion document for the research work that is scoping an information model to improve proposal processes within the context of the VIVACE project (Sub-task 2.1.3_2).

1.2 AIMS AND SCOPE OF THE REVIEW

The aim of this document is to review the processes for generating customer value and offering customised solutions in industrial markets. The report is offered as a briefing document for VIVACE partners on the best practices used by businesses in other industries and problems identified by other businesses in implementing change.

This review has been performed to facilitate the transfer of knowledge and learning from other industries. The study has focussed on what aspects of processes, resources and technology used in other sectors could be applicable to the aerospace industry. The high-level issues that have been considered in searching for evidence in other industries are:

1. How can profitable customer value be generated?
2. What successes have been realised by technology and resources to generate value from customer solutions?
3. What difficulties have been encountered in offering customer solutions, particularly in the implementation of technology applications in front-office areas such as sales and design?

Our review of current practice has focussed on identifying the concepts and models have been used in other sectors to shed light on these issues.

1.3 SELECTION OF RELEVANT SECTORS AND SOURCES

The sectors that have been targeted all involve business-to-business transactions. They address the manufacture and/or support of a range of products, some quite complex:

- Information technology
- Medical
- Furniture
- Engineered and mechanical products
- High Technology sectors such as electronics
- Automotive
- Capital equipment
- Instrumentation
- Other services

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These sectors were selected because typically they involve significant levels of customisation, additional service provision and proposal-writing or tendering in business-to-business relationships. The sources of evidence for these businesses included academic journal papers, magazines of professional bodies and other publications such as consultancy journals, often describing restructuring or other changes in the business model of the companies under study.

2. THE PROPOSAL PROCESS IN INDUSTRIAL MARKETS

This chapter provides a summary of the evidence of proposal processes that has been found through study of literature. All the companies documented were seeking to provide improvements in some aspect of their business activities either through strategy changes or through process changes. (The evidence is summarised, sector by sector, in Appendix 1.)

Two principal approaches were found to be used in proposal generation; software-centric and human-centric, as described in the sections that follow.

2.1 SOFTWARE-BASED PROPOSAL GENERATION

Two key information systems that are becoming widely adopted in the sales and design functions are Customer Relationship Management (CRM) software and Product Configurator (PC) software.

2.1.1 CUSTOMER RELATIONSHIP MANAGEMENT SOFTWARE

Customer Relationship Management software is employed in the proposal generation process to capture and summarise customer enquiries about products and services, and track how far each customer interaction has progressed, and the decisions made. It should also ensure a long-term relationship with a series of mutually satisfactory transactions.

It has met with limited success in some areas (Ebner *et al*, 2002). There is little evidence of businesses that have succeeded in implementing full integration of information systems in business markets for seamless order fulfilment from customer order to delivery.

2.1.2 PRODUCT CONFIGURATOR SOFTWARE

A study of the product configurators used by companies in business-to-business markets has revealed that a range of tools are available (Bramham & MacCarthy (2003)). Prototype configurators are currently being developed that integrate product information from more than one supplier (Malis & Hvam, 2003).

At the heart of the PC software is the rules engine. This is used to describe product elements and how they may be constructed. The most common rules engines used in PCs are:

1. Hierarchical inheritance of parameters
2. Constraint-based parameters
3. Attribute-based parameters
4. Knowledge-based parameters.

The choice of rules engine is important because it can impose constraints on the proposal process and can dictate the sequence of how the product offering is constructed. The configurator has been interfaced with Customer Relationship Management software, which is used to store information on customer needs in order to link product information with customer information in some businesses. This link can be

provided by additional software which may also provide the interface with production information systems (Kruse & Bramham, 2003).

2.2 HUMAN-CENTRIC PROPOSAL GENERATION

A study of manufacturing suppliers moving toward increased customer solutions revealed a proposal generation process that was highly informal. Complex interactions were required to complete a proposal, and roles were not reflected in the organisational structure, nor in the responsibility defined in job descriptions. The study revealed that informal roles were used to support the proposal process (Bramham *et al*, 2005).

People would be used for their expertise or involvement in preparing previous proposals. It was not possible to describe all the specific knowledge in a database because it was context-specific, taking into account anticipated competitor bids and the expectations of the customer for the particular application of the product.

The research found that proposals were prepared by people who made collaborative decisions; no single expert could confirm the feasibility of a product or commit the business to a contract. The proposal process could be described by four decision centres, as shown Table 1:

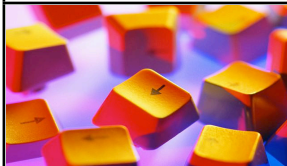



Table 1: Decision centres in the proposal generation process		
Decision centre	Aims of decision centre	
	Customisation request initiation and information gathering on customer needs	Collect information in dialogue with the customer on their requirements
	Classification and routing of requests	Route customer enquiries to the relevant experts in the company
		Prioritise customer requests
		Understand the scale of the modifications to meet customer requirements
	Prioritisation, resource allocation and management	Assign technical resources to the consideration of customer requests

Table 1: Decision centres in the proposal generation process		
	Identification of potential for information reuse	Assess what information is likely to be useful in the future for further customer orders or proposals
		Analyse the feedback on the success of proposals and accuracy of estimates associated with customisation requests

2.3 SUCCESS FACTORS IN THE PROVISION OF CUSTOMISED SOLUTIONS

Evidence has been found of a sizeable number of solutions providers operating in industrial markets. Problem areas in preparing proposals relating to *services* that were identified by Parasurama (1998) would seem to remain current in the challenges faced by businesses. The four areas are as follows:

- Market information gap – incomplete or inaccurate knowledge and understanding of customer needs.
- Service standards gap – failure to translate customer needs accurately.
- Service performance gap – lack of internal support systems to deliver services.
- Internal communication gap – inconsistencies between what the customer was expecting and what was delivered.

The evidence that we have reviewed suggests these issues are still current and that organisations are seeking to address them not just through the application of information technology but through organisational changes and training. Some solutions providers have recognised that automation through information systems application in the front-office is not a quick fix. There also needs to be a focus on the management of knowledge and expertise (Bramham & MacCarthy, 2005).

Evidence has been found of solutions providers that appear to have evolved further because they provide products that achieve ‘customer outcomes’ (Ulwick, 2002). The changes in strategy have been instigated because these businesses have recognised that their customers have problems in defining what solutions will meet their needs. This means that they do not focus on customer solutions but on offerings that they refer to as ‘customer outcomes’.

3 DEFINITIONS AND CONCEPTS ADOPTED IN OTHER SECTORS TO DESCRIBE THE PROPOSAL PROCESS

The VIVACE information model should provide a step change in the processes used to prepare a proposal for a customer on a solution or product offering. We review the perspectives that other organisations in other sectors have taken in understanding their proposal processes through definition and use of concepts. The annotated bibliography provided in Appendix 2 offers a more detailed review of relevant literature.

3.1 DEFINING THE PROPOSAL PROCESS

The definition of the proposal process is a key step in the development of the information model for the proposal process, and VIVACE is no exception. A relevant framework for understanding the process of selling to a customer in an industrial market is provided by Webster & Wind (1972). They identify characteristics that are unique to selling in industrial markets. The first is that industrial selling is performed within a formal organisational structure and involves multiple decision-makers. This implies that the management of people and an understanding of the organisational structure are important. Webster & Wind (1972) decompose selling and buying tasks further into:

1. Organisational purpose;
2. Nature of demand;
3. Extent of “routineisation” of processes;
4. Degree of decentralisation and delegation of authority.

This implies that selling tasks vary within an organisation and the correct process should be chosen for the application. One important definition that is relevant to the development of an information model for proposal processes is that selling requires a communication subsystem, performing the following functions:

1. Information;
2. Command and instruction;
3. Influence and persuasion;
4. Integration.

3.2 RE-ENGINEERING THE PROPOSAL PROCESS

This section discusses the step-changes made by businesses in order to address the challenge of providing customer solutions. One common focus is the analysis of customers' processes in order to diagnose their needs. There are a number of approaches for this analysis including identification of value gaps in the customer activity cycle (Vandermeewe, 2000) and structuring the customer's buying process (e.g. Freed *et al*, 2003; Bramham *et al* 2005). This could involve support and facilitation of re-engineering customer processes particularly in procurement and financial activities. Some contemporary literature focuses on capturing customer financial information so that the value of the solution can be justified to the relevant customer departments. One procedure for this is described by Roegner *et al* (2001). Here a series of questions are

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posed by the sales person to allow the relevant information to be collected for preparation of the business proposal. The approach is based on a decision tree of questions about the implications of implementing the solution that is defined in a draft of the proposal. Questions are based on understanding the changes that would occur in:

- Marginal revenue
- Marginal cost
- Marginal investment
- Revenue with and without the new system
- Revenue from new technology

Another strategy that has been adopted in understanding customer needs when providing customer solutions is to move the point of value creation closer to the customer by providing the customer with a user toolkit (Thomke & von Hippel (2002)). This user toolkit has product rules and information embedded into it, and is made up of multiple software elements to allow testing of solutions. The changes to the process are illustrated in Figure 1. It could be perceived as a risky strategy because the supplier is selling expertise to the customer and reducing their power in the supply chain, but it may provide an important competitive edge if lead-time compression is important.

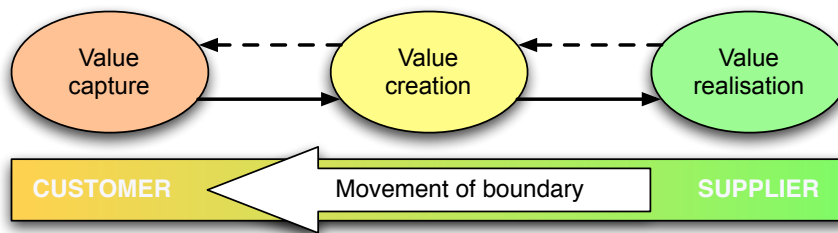


Figure 1: Moving the point of value creation

3.3 SELECTION OF AN APPROPRIATE PROPOSAL PROCESS

There are different levels of knowledge in the customer base and some customers will need more guidance than others (Ulwick, 2002). This suggests a spectrum of users, and may mean that a particular solution is not appropriate to all customers. The business model mapping methodology described in D2.1.2_3 [Farr, 2006] describes the level of customer knowledge as something that could be plotted on a scale.

3.4 DESCRIBING PRODUCT OFFERINGS OR SOLUTIONS

Peters & Saidin (2000) developed a theory on the mass customisation of services. They describe how this may be supported by the development of modular services. The services are described in 'cookbooks' of procedures, based on the following three levels:

- Molecules – complete scope of work / services.
- Elements – stand alone elements that can be offered to customers.
- Atoms – lowest level of detailed break down of service components. Constituent parts of elements but not offered to the customer in their own right.

Magrab [1997] identifies modularity as an enabler for mass customisation, allowing simplified schedules and shortened delivery dates, easier assembly, continued use of certain modules in newer products, easier repair and maintenance, and improved availability of spare parts. Six reasons for modularity were identified:

- Component-sharing (same part used across a range of products for economic benefit)
- Component-swapping (customising a product by the choice of components used, as with the lenses in a pair of prescription glasses)
- Cut-to-fit modularity (as when clothing is made)
- Mix modularity (where parts are combined in accordance with a 'recipe')
- Bus modularity (where a standard structure exists, to which different modules can be attached as extras or substitutes)
- Sectional modularity (where standard interfaces allow components to be put together in arbitrary ways)

Baldwin and Clark [1997] suggest that a modular product allows a business to cope in an environment where customer requirements and technology are both changing rapidly. There is a danger, however, that the piecemeal redevelopment of a product will actually be impeded by the presence of modules which are themselves likely to become obsolete in the future (Ulrich and Tung [1991] refer to this as *static product architecture*). This can be seen in the design of some desktop computers that feature a number of standard interfaces that must continue to be supported long after technically superior alternatives have become available.

Thus, if a functional product offering can be subdivided in a manner where the boundaries between the components are appropriate, the provider can be more competitive, and more responsive. For the manufacturer of aerospace systems, certification requirements may limit the variety that can be achieved, but the service dimension may offer considerable scope.

4 CONSIDERATIONS FOR RAPID PROPOSAL GENERATION IN THE AEROSPACE INDUSTRY

Thus far, this document has examined the means by which industries in other sectors configure their offerings in response to customer requirements. This chapter attempts to interpret these findings, and apply them in an aerospace context.

The proposal process in the aerospace industry is a complex system (described in some detail by Sabbagh, 1996) and there is a risk of oversimplification in the design of any information model that seeks to represent such a system. A proposal process that does not operate efficiently may expose the business to serious penalties and financial losses from the lengthy support phase of an unprofitable contract, or the risk of orders being awarded to a competitor.

A holistic approach must be employed when constructing any information model to aid in the proposal process. The model should focus on the customer because it is their behaviour – their perspectives on value and how they wish to structure the buying process – that drives the activity. Value is a difficult concept to quantify, not least because different customers will value different things. Hedenryd et al (2006) describes how virtual airlines and flag carriers may have widely different expectations of the engines that they select. Any such interpretation of customer value is likely to require a human-centric rather than software-based approach (see Sections 2.1 and 2.2). However, the people working to create a new proposal can still be supported by systems and processes that facilitate communication and knowledge capture, so an information model has considerable value.

4.1 THE INFORMATION MODEL FOR THE VIVACE PROPOSAL PROCESS

This document was originally circulated in a draft form in late 2004. At that time, much remained to be determined about the information model for the seven-day proposal. The authors proposed that the information model should be customer-oriented, geared towards the sale of customer solutions. Therefore, the framework was based upon defining customer value in addition to the core process describing the preparation of the proposal; we referred to the combination of these processes as Value Generation. The key elements of value generation are shown in Figure 2, defining customer value in terms of outcomes, creating the customer value concept and realising these customer outcomes.

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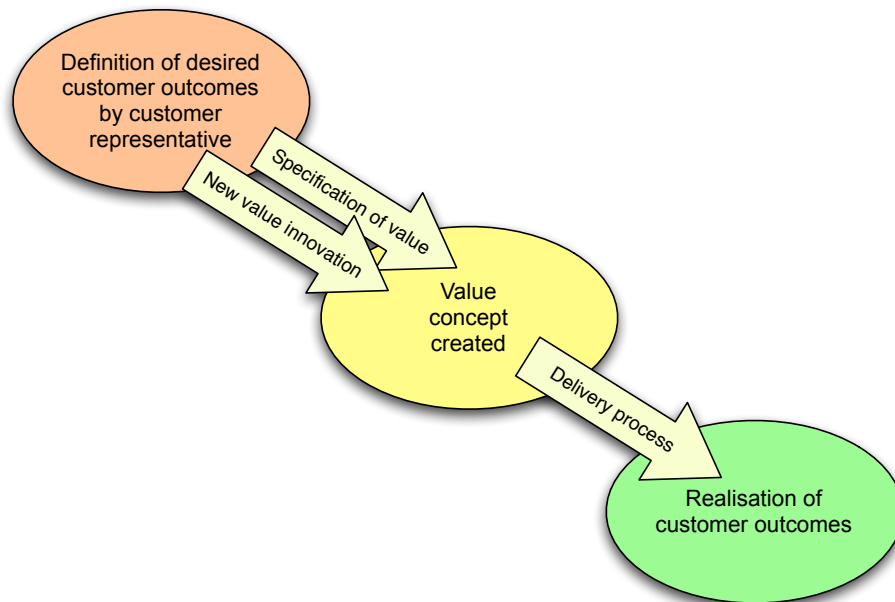
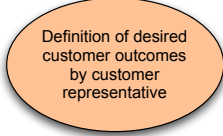
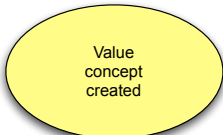
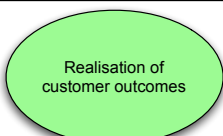


Figure 2: Key stages of value generation

These stages each place requirements upon the information model, as Table 2 shows:

Table 2: Information model requirements upon the proposal generation process	
	<ul style="list-style-type: none"> • When should different value generation processes be used for different customers? • What interactions should be used with customers to define value? • What mechanisms should be used for defining customer value? • Where should be problems be solved for developing new value propositions – with the customer or offline?
	<ul style="list-style-type: none"> • What processes should be used to create customer value? • How should the benefits to the customer of investing in the value generation process be described (before value realisation)?
	<ul style="list-style-type: none"> • When does the customer realise the value of the solution? • What can be learned from the transactions that have taken place, in order to establish or maintain a continuing relationship with the customer?

Since this document was originally shared within the WP2.1 partners, much work has been done towards defining the information requirements and processes relevant to the proposal generation process, including [Dannemark et al, 2005] and [Bovik, 2006], VIVACE deliverables that provided a formalised description of a phased proposal

process used at Volvo Aero Corporation. These supported the contention that the proposal generation process should be based upon a recognition of customer value, taking into account roles, responsibilities and organisational structures.

4.2 SERVICE COMPONENTS OF THE SOLUTION

A modular architecture, as discussed in Section 3.4, means that functional elements can be interchanged in order to configure a product that meets customer requirements. For the aerospace industry, modularity offers additional value in that it allows for mid-life upgrades, and easier maintenance through line-replaceable units. The exploration of service offerings falls within Task 2.1.4 rather than 2.1.3, and is therefore not the subject of this deliverable. It should be noted, however, that theory on the architectures of product hardware (Ulrich, 1995) is also being applied to *service* customisation in other sectors (e.g. Peters & Saidin, 2000). There is clearly a modular aspect to operators' requirements; some airlines have a substantial in-house maintenance facility and will perform many tasks themselves, while others operate as 'virtual airlines', and will need to buy in a broader range of service components. Hedenryd et al (2006) explores a potential shift in the marketplace, with the emergence of a customer that would be happy to treat engines as a consumable commodity rather than a capital asset.

Some service components will be discrete things, to be scheduled and delivered in much the same way as a product; for example a certain inspection that must be done to each engine after a certain number of cycles or flying hours. Other services might be less directly related to individual products, such as information that is provided to the operator in much the same way, whether they have two engines or a hundred. Some services may not be perceived as being of great value by the customer, but may be of great importance to the provider, because they enable other product or service components to be delivered more effectively. There is a danger, when splitting a functional product offering into its component parts, that the customer will try to remove elements of this kind from the contract.

Any customisation to be achieved by mixing components requires clearly defined boundaries and interfaces, and a means of ensuring that the selected components form a suitable whole. This is particularly important in the aerospace industry, where customisation is constrained by certification requirements. Thus, allowable combinations of modular product and service components must be represented within the information model, limiting the complexity expressed in terms of the various permutations possible.

4.3 INTEGRATION BETWEEN COMPONENTS, AND THE INFORMATION MODEL

A matrix of product offerings was developed by Roegner et al [2003], as shown in Figure 3. This may help when discussing the desired level of integration between various components of the functional product offering. This matrix classifies actors as being either component specialists, bundlers, integrators or solutions providers. Different levels of integration will appeal to different customers, depending upon their own in-house integration capability; virtual airlines will select more highly integrated 'turn-key' systems, for example, since they do not consider maintenance, repair and overhaul to be a core activity.

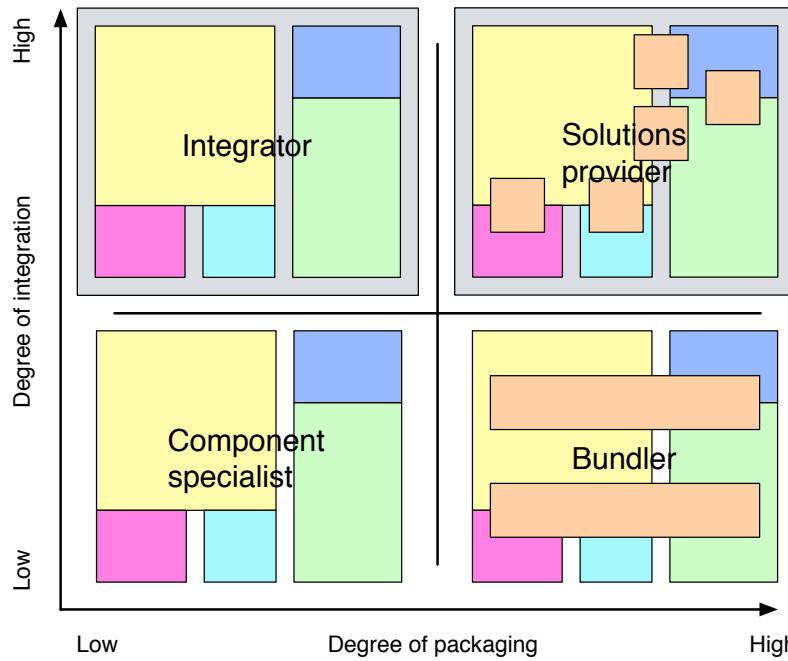


Figure 3: Classification of the product offering [Roegner et al, 2003]

In any consideration of integration we will need to consider the following questions:

- 🕒 Where are product and services fragmented?
- 🕒 Where would it be valuable to further integrate services?
- 🕒 How can customer needs be classified into different quadrants?

5 CONCLUSIONS

This document has presented a review of the proposal generation process employed in other sectors, and discussed the unique requirements of the aerospace industry in order to identify practices and tools that might be adopted.

It was identified that the breadth of scope of any solutions that are to be offered through an information model must be controlled, since not all permutations of functional product components will be economically or technically viable. Clearly, different customer groups will have different requirements, and these may extend to a requirement for different interfaces, both organisationally and in terms of any application of information technology.

The design of the proposal process has strategic implications. Those relevant to the seven-day proposal include:

- Strategic integration of companies in the value chain will be required to allow capabilities of the value chain to be aligned. Theory has been developed on methods for aligning the strategy companies and their environment e.g. Fuchs et al (2000).
- Measures will be needed to counteract the negative impacts associated with offering modular options to the customer. For example, standard packages could be broken up and devalued. The benefit of applications that allow the supplier to diagnose customer needs may need to be emphasised to the customer.
- Additional training may be required for salespeople interacting with the customer, to allow them to sell the benefits of integrated customer solutions, and to explain the implications to the customer's own value chain and business model.

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APPENDIX 1: CASE STUDIES OF THE PROPOSAL PROCESS

This appendix provides a summary of the evidence that was gathered, through a study of the literature, for proposal processes in other sectors. In all these case studies, the companies documented were seeking to achieve improvements in some aspect of their business activities either through strategy changes or through process changes.

Authors	Product and customisation / value provision	Improvements implemented	Defining customer needs	Creating customer value	Realising customer value
Sector: Information Technology					
Peters & Saidin (2000)	Customization of services in network computing for small & medium businesses [IBM]	Convert increasing numbers of 'special bids' that require modification of standard offerings into 'business as usual' responses.	Knowledge of the local context is important - local firms provide more appropriate solutions to customer needs. Processes for sharing regional expertise in sales for finding the right skills for different services. Sales skills database.	Transmitting of customer needs to competencies in the organisation through information systems. 'Snap' modular processes together.	
Roegner et al (2001)	Network infrastructure provider – software, hardware and professional services ['Infrasolv']	Provide solutions to generate additional revenue	Process for evaluating customer value which breaks down customer benefits into a decision tree of key areas.		
Sector: Medical					

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Authors	Product and customisation / value provision	Improvements implemented	Defining customer needs	Creating customer value	Realising customer value
Ulwick (2002)	Medical devices [Johnson & Johnson] Value innovation (no customisation).	Defining 'customer outcomes' Establishing stages of usage of the product (product lifecycle perspective).	Interview groups to define the step by step process associated with the product / service. Interview groups include diverse people involved with the product – doctors and surgeons, nurses and hospital managers.		
Sector: Furniture					
Bramham & MacCarthy (2004)	Customer specified office solutions. [Seat Selector]	Automation of ordering processes using a product configurator.	Supported by a specialist with technical knowledge (ergonomist)		
Sector: Manufacturing products					
Thomke & von Hippel (2002)	Resins for the customer application [GE Plastics]	Provide customers with sufficient information for them to do their own testing.	Provide online product knowledge. Users are screened to identify whether they are potential new customers.		
Bramham & MacCarthy (2005)	Providing customer solutions [Sandvik Coromant]		Structuring of the customer buying process.	Triage role to route requests.	Supplying competitor products as part of the solutions package

This document is classified as VIVACE public

Authors	Product and customisation / value provision	Improvements implemented	Defining customer needs	Creating customer value	Realising customer value
Corso & Pavese (2002)	[Optical products]	Selling total solution and service	Increasing the competencies of sales people in problem solving and integrating with other parts of the organisation		
Sector: High Tech					
Thomke & von Hippel (2002)	Semi-conductors [Pioneer LSI Logic]	Selling of product definition knowledge in user toolkits to define product	Meeting customisation needs when customer needs are complex and implicit. Value creation at the point of capture of customer needs.		
Sector: Automotive					
Lucrat-Labry <i>et al</i> (2002)	Truck manufacture [Scania] Provision of financial services	Top sources of profit: spare parts, finance and leasing, insurance... New sales were 7th. Expecting main revenue to come from post equipment sales	Service offerings quoted through the extended network e.g. dealerships. Learning from customer through many channels.		Increased control over sales and service channels
Eringfeld (1992)		Limitless range of configuration – costing of variants using ABC costing	Organisational structure – functional integration.		
Sector: Capital Equipment					

This document is classified as VIVACE public

Authors	Product and customisation / value provision	Improvements implemented	Defining customer needs	Creating customer value	Realising customer value
Erens & Hegge (1994)	Medical equipment [Medicon]	Providing high product variety Improving lags and inconsistencies in providing a quotation	Reduce internal sales by providing external sales with technical information	Integrated generic bill-of-materials based on hierarchical parameters	
Sector: Instrumentation					
Buzby <i>et al</i> (2002)	Precision products for aerospace and commercial equipment [Westfield Gage Inc]	Improve the delivery of quotes to customers (40% late and 10% of enquiries not responded to)	Use of lean manufacturing techniques to streamline paper systems.	Creation of TAKT time for repetitive quotation processes (57.3 minutes per employee)	
Sector: Other Services					
Davenport & Glaser (2002)	Health care services [Partners Health Care, USA]	Improvement of the accuracy of prescribing drugs (achieved 55% reduction in errors)	Expert systems monitoring and prompt doctors when they are diagnosing and prescribing.		
Quinn & Paquette (1990)	Airlines Utility providers	Technology in services		Recommend breaking services down into 'new conceptual configurations' and focussing on the management of these for consumer markets. BUT for large transportation providers rely on 'traditional economies from large-scale facilities'.	

APPENDIX 2: BIBLIOGRAPHY

This chapter provides an annotated bibliography of the evidence of proposal processes in other sectors, and theory on key concepts.

Corso, M. & Pavesi, S. (2002): *Knowledge Management Configurations and Approaches: The Case of the Sales Process, in the proceedings of the 2002 EurOMA conference, April 2002, San Fransisco.*

Key words: knowledge systems, organisational structure.

The paper describes two case studies of businesses that are seeking to increase their ability to provide solutions. The authors analyse the effectiveness of implementation of knowledge systems based on rating a business on the following dimensions:

- Horizontal specialisation – here a rating is made on a scale of specialized units / wider responsibility.
- Vertical specialisation – here a rating is made on a scale of hierarchical / cooperative.
- Knowledge transmission vehicle – here a rating is made on a scale of technical / relational.
- Formalisation – here a rating is made on a scale of informal and implicit / explicit and systematic.

Although the authors do not draw conclusions on the implications of the business characteristics they imply that the businesses with wider responsibility, cooperative organisational structures, relational mechanisms for transferring knowledge and high levels of informal and explicit knowledge will find implementation more difficult but may find that it yields important benefits.

A detailed description is provided of the implications of implementing a knowledge system one of the companies. This knowledge system was to provide 'dashboards' of information to link to particular topics. The knowledge system is managed by headquarters but the sales users and the people who are creating tacit knowledge. Difficulty was noted in incorporating this tacit knowledge. System engineers still need to support account managers in configuring systems and business consultants provide knowledge about the product to account managers. Therefore a network of experts is required to support the maintenance of the system.

The implementation of the knowledge system meant that organisational changes were required with new roles created for account managers, business consultants and system engineers. Some of the organisational constraints were noted as:

1. The people appointed as account managers did not have a strongly technological background.
2. The reward system means that selling of products by account managers with a high margin is encouraged. (This may not be the product that meets customer needs as closely as a product with a narrower margin and so may have longer term implications for customer satisfaction).

The benefits of the knowledge management system (web based) were that it reduced training costs and aided the integration of a new business unit with new product lines.

Davenport, T. & Glaser, J. (2002): *Just-in-time Delivery Comes to Knowledge Management, Harvard Business Review, Vol. 80, Issue 7, July 2002, pp. 107-112.*

Key words: knowledge systems, service quality.

The implementation is described of an information technology system to improve the accuracy of the prescription of drugs by doctors. This system aims to improve the management of knowledge. The system is designed offer an integrated information system and provides two functions: (1) it alerts doctors on the conflicts between drugs and (2) recommends drugs based on symptoms. Doctors are able to embed their knowledge in the system. The system is self-monitoring so that doctors are not able to regularly bypass the system.

The implementers of the system stress that knowledge systems such as this are only appropriate for critical knowledge processes because of the expense of setting up and maintaining such as system. The authors note that cultural changes were required because the implementation of the system reduced the autonomy of doctors.

Erens & Hegge (1994): *Manufacturing and Sales Co-ordination for Product Variety, International Journal of Production Economics, Vol. 37, pp. 83-99.*

Key words: product variety, selling.

The authors describe an integrated information system that supports the key stages of the selling process that they have defined as:

1. Sale of product offering;
2. Sales logistics of enquiry processing;
3. Acceptance of an order;
4. Assembly of the order.

The information system has been designed to facilitate the preparation of the bill of materials of the product. It contains product specification from a sales and a manufacturing view so that product descriptions are the same across departments. But the information system allows the user to 'discriminate between variants in commercially understood terms'. The product hardware has been described in terms of a common architecture. The architecture has hierarchical levels meaning that parameters can be inherited from the components on the level above. This eliminates infeasible configurations of the product. The information system also contains links to the manufacturing schedule and gives feedback on delivery and costs.

Eringfeld, P. (1992): *Market-Driven Manufacturing: A Case Example, in Integration in Production Management Systems, eds. Pels, H. & Wortman, J., Elsevier Science, Holland.*

Key words: organisational structure, information systems.

The authors describe the implementation of ABC costing to provide accurate costings of a large number of product variants. They also describe the importance of people to support information systems - 'team members are experts in exceptions'.

They describe organisational structural changes that were required including functional integration for short communication lines, parallel activities and close knit teams combined with the use of accumulated knowledge and experience.

Freed, R. Freed, S. & Romano, J. (2003): Writing Winning Business Proposals, McGraw Hill.

Key words: selling decision making, selling processes.

This is an example of a new type of sales book that focuses on structuring the buying process. This book identifies four types of roles in the buying process – user, economic, coach and technical. The aim is to develop a value proposition for the individual customer. A value proposition is defined as ‘a concise summary of your offering. The brief expression of the overriding problem / opportunities, effects, desired results, benefits, timing and costs.’ The development of value proposition divergent and convergent thinking stages for the sales person. Identifying customer needs requires divergent thinking. Finding a solution requires convergent thinking to focus on the capability of the business.

Parasurama, A. (1998): Customer Service in Business-to-Business Markets, Journal of Business and Industrial Marketing, Vol. 13, No. 4/5, pp. 309-321

Key words: customer services, service quality.

This paper introduces a way of classifying types of customer service according to the consumer and the hardware. The three categories are services presented are:

1. Offerings with a tangible core
2. Offerings to be consumed by the buyer
3. Offerings to be sold on.

The application of the SERVQUAL framework is presented as a method of evaluating the quality of service offerings. The author also highlights that service quality can be evaluated in terms of ‘organisational gaps’.

Peters, L. & Saidin, H. (2000): IT and the Mass Customization of Services: the Challenge of Implementation, International Journal of Information Management, Vol. 20, pp. 103-119.

Keywords: service customisation, modular services.

This paper reviews the problems and implications of implementing a strategy to mass customise services using a modular architecture for services. The authors describe the response to customer needs as being supported by the ability of a business to codify signals from the environment. The information embedded in the coding needs to be shared and then decoded by recipient(s) inside the company. Coding or decoding of information may need to be supported by a skills database of experts. CRM software may be used to manage customer information but implicit sales knowledge remains because systems and procedures do not encourage the recording of commitments or process accountability. Companies with a high turnover of people are likely to lose implicit knowledge.

Options driven by a customer may be recorded in an additional database however the management of this growing database is problematic and it is still possible that this enlarged database may not contain the options that other customers require.

Roegner, E., Seifert, T. & Swinford, D. (2003): Putting a Price on Solutions, McKinsey Quarterly, No. 3.

Key words: solutions, customer value.

This article tackles the definition of solutions concepts. A taxonomy of solutions provision is proposed according to level of integration and interfacing - grouping of components together and increasing the integration of interfaces (knitting components together.) The taxonomy is a conceptual model and lacks explanation of how solutions providers or bundlers can. The solution provider is pictured as adding a dimension to their product offering.

The authors present an approach to evaluating customer value for a proposal based on calculating the price range. They propose that a solution must be linked directly to financial performance measures so that it can be justified to shareholders.

They present a procedure based on costing the price band of the value of a solution. Firstly, costings are generated for standard configurations of the product offering. Then another costing of value is evaluated using multiple criteria. These items were evaluated over the lifetime of the solution:

1. functional benefits,
2. relationship benefits,
3. process benefits,
4. operating costs,
5. capital costs savings
6. increased revenue.
7. incremental value over customer solutions.
8. cost of unique technology.

The price of a solution differs from customer to customer but the same procedure for costing the price band is standard. The authors highlight that if the price band is narrow then there is not much scope for selling solutions.

This implies that there may be cost savings to be gained in the customer's internal departments such as purchasing resource. This may require the solutions provider to suggest cost savings and restructures that are outside the bounds of the existing relationship. The relationship may need to grown to support these suggestions. The solutions were presented to senior managers within the customers' businesses.

Thomke, S. & von Hippel, E. (2002): Customers as Innovators, Harvard Business Review, Vol. 80, Part 4, pp. 74-85.

Key words: product definition, implicit customer needs.

This paper describes fundamental changes to customer interaction processes in businesses that have had difficulty in helping the customer to explain their product needs. They refer to these elusive customer details as implicit customer needs and the information that describes these needs as 'sticky information' because it is difficult to move from the customer to the supplier. The authors describe a new approach to managing the customer interface – they 'outsource' innovation to the customer when customers have the knowledge to develop own prototypes and test them. This allows that the customer to be more proactive in customization. This approach claims to have reduced sales – customer interactions by half in one company.

This outsourcing of innovation is achieved by providing an information system, referred to as a user toolkit, to the customer that contains the rules for defining new products. The rules are made up of the description of product elements or modules and constraints in production processes. The toolkit may be made up of a number of tools including tools to construct new products based on graphical interfaces, tools to test designs, tools to provide simulations and tools to create prototypes through trial and error.

These user toolkits are developed with the intention of being used by customers and some of the systems have been sold to customers for them to generate their own product innovations. This has made substantial changes to the value chain and the supplier's business. The core business of the supplier following the sale of a 'user toolkit' is in manufacturing and updating the rules in the toolkit.

Ulwick, A. (2002): Turn Customer Input into Innovation, Harvard Business Review, Vol. 80, Issue 1, p. 91-98.

Keywords: customer value, user groups.

This paper describes the processes for identifying improvements to product hardware based on capturing the detail of the product application by customers. These processes do not focus on customization for individual customers but on understanding customer needs when discussed in a group of many customer representatives. The identification of the participants of this group is highlighted as very important. There are instances where the exercise has failed because the user group was too technically sophisticated! The group is facilitated by a 'moderator' who goes through the customer use process in detail, clarifying words and providing systematic analysis of the application of the product by the customers. The customers who have direct experience of using the product describe different stages of usage. Then the moderator translates the customer needs into an outcome statement that includes specifications and constraints. The focus is on customer outcomes rather than needs. This includes the type of product improvements required and methods of measuring improvements. Understanding customer application to this level of detail helps to understand how customers measure value.

The second phase is to confirm the findings on customer value in a survey. The survey results are used to calculate an 'opportunity rating'. Issues are identified and then confirmed with a wider sample of customer base.