

VIVACE Third tier suppliers session – VIVACE methods

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Thank you Bruno for your update on the characteristics and requirements of smaller suppliers.



Objectives

The objective of this session is to

- 1. Provide information on the methods emerging from VIVACE to date.**
- 2. Consider the view of these for smaller suppliers.**
- 3. Give an indication of the considerations smaller suppliers may have to make, in this type of business environment.**

The information provided is an indication of the results from this research to date, ahead of formal deliverables being made from VIVACE.

This session will now start the process of presenting the methods identified so far with regards to smaller suppliers, and provide an as shown in the three Objectives we have set for ourselves provide an Indication of the issues that suppliers will have to consider in the collaborative environment that Aerospace supply chains of the future may apply , We would point out that this information is provided ahead of any of the formal deliverables that will cover the research to date, hence should be considered as information reflecting the status of the research, but pending validation within the Programme..



An overview of the VIVACE methods, and considerations for smaller businesses

VIVACE methods focus on the following areas :

- Concept, Design and simulation of aircraft and Propulsion systems and sub systems .
- Optimisation of the product design and development process for aeronautical products.
- Business operations in a collaborative engineering environment including ; ***life cycle cost modelling, rapid proposal generation, supply chain simulation and optimisation models, long term product support, production supply chain modelling, knowledge management, product change management.***
- IT environments to support collaborative engineering.

The VIVACE programme focuses on methods for reduction of product development costs and lead times with the following areas of research to support the critical initial stages of product and programme development, typically through to certification :

Concept design, and feasibility study work, simulation of aircraft and propulsion systems, sub systems and integration.

Optimisation of the product design and development processes, and management of change.

Business operations that support the collaborative engineering environment, such as life cycle costing, rapid proposal generation,

And simulation and optimisation techniques that will optimise the supply chain based on efficiency, supported by modelling of the

Production supply chain, and the management of knowledge.

Finally VIVACE is developing methods that support the collaborative environment using web based techniques.



An overview of the VIVACE methods, and considerations for smaller businesses

Many of the methods developed are aimed at Prime And Tier 1 contractors, with the objective of creating more Efficient processes for :

- Developing aircraft and propulsion systems and sub systems.
- Providing more rapid forms of simulation and design and other engineering analysis methods for product optimisation.

However other business based processes have been defined Which need consideration in a supply chain environment.

It is recognised that many of the methods are aimed at the prime companies and tier one suppliers where a very high percentage of the product development, risk, integration

and certification activity is completed.

VIVACE is therefore generating more effective and efficient approaches for developing systems and subsystems, and more rapid techniques for simulation and optimisation.

However other business process have been defined which can go through the wider supply chain, and we have highlighted these in the context of smaller suppliers, that are largely operating in a mature environment of product development, and innovation, where safety and product integrity is critical but where cost is a vital driver.



VIVACE areas of supply chain activity

Possible areas where supply chain activities occur
Within the VIVACE methods that suppliers may be involved
In a collaborative environment are :

- Product change and impact assessment.
- Supply chain modelling and production planning.
- Support planning, against components/subsystems
- Cost inputs.
- Design models supporting the whole product model
(for design and make, or design and technical assessment
Companies).

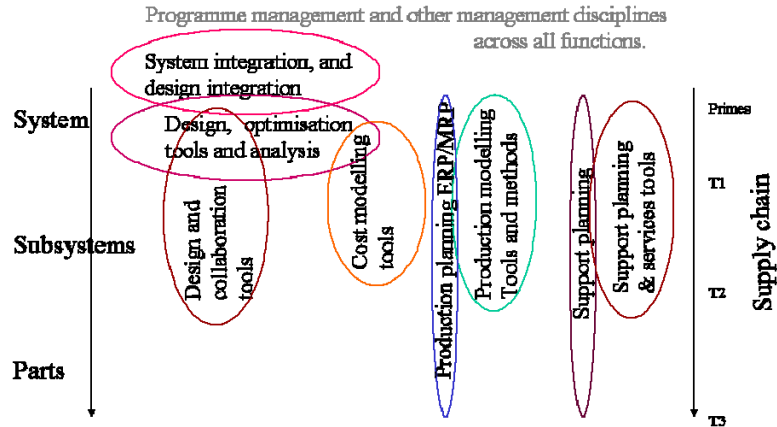
Possible areas for smaller suppliers being :

- the processes defined for Product change and impact assessment on design
- Supply chain modelling and production planning
- Planning for support services associated with aircraft and engines and their main subsystems
- Provision of cost information to support the planning processes
- The role suppliers may play in supporting the overall product design and its models, where companies are design and make organisations or provide technical services.



An overview of the VIVACE methods, and considerations for smaller businesses

Viewed from a First Tier perspective these can be considered as ...



Activities associated with Aerospace design, production, and System support and services

This chart shows a high level view of the types of method being developed in VIVACE and how they fit within a multi level supply chain or typical product breakdown.

At the top we have system integration at the original equipment manufacturer and system integrator level, typically the Aerospace primes.

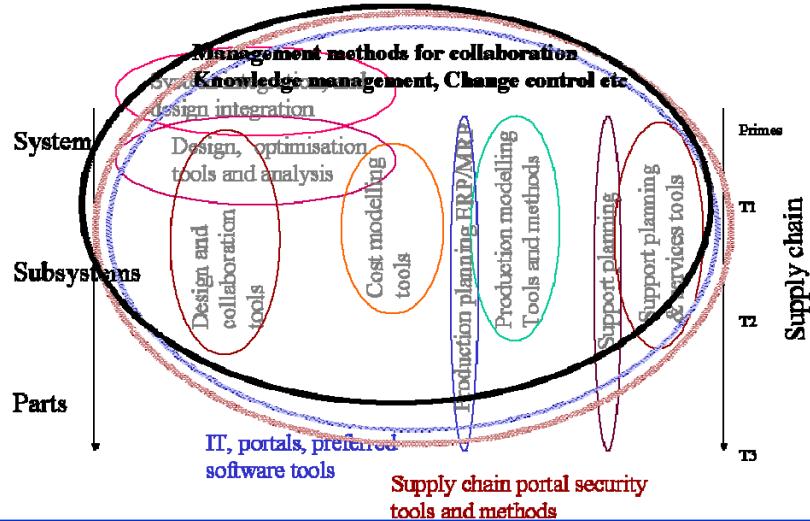
This is supported by the design optimisation processes and tools.

Down the supply chain and product breakdown we typically have a range of functions associated with design, cost modelling and optimisation, production planning, and modelling, and support planning.



An overview of the VIVACE methods, and considerations for smaller businesses

and in a collaborative environment is ...

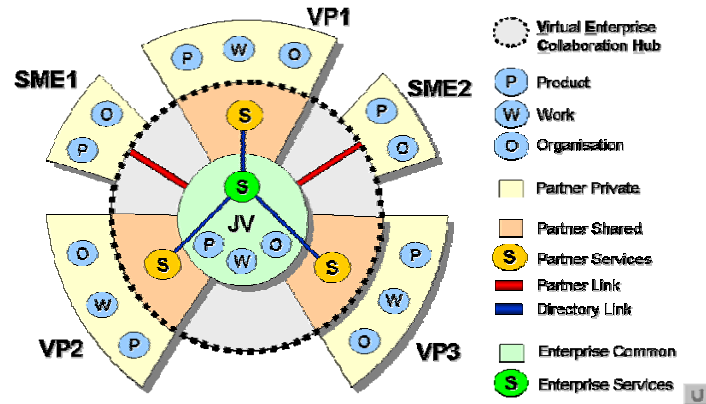


The functions defined are then managed and integrated within a collaborative engineering environment using specific tools, portals and hubs for networking, and applying a range of controlling processes collaboration, change control and knowledge management.

These functions are the main means of enabling the VIVACE methods in the collaborative environment, and the change control and knowledge management methods are two important capabilities that support the design and development processes.



An overview of the VIVACE methods, and considerations for smaller businesses



The VIVACE model for collaborative working, for product, work, and organisation breakdown



An overview of the VIVACE methods, and considerations for smaller businesses

So what does this mean from a 3rd Tier supplier perspective ?

How does it effect my ability to be competitive and win business ?

What type of supplier am I ?

Does it effect how I deliver my business ?

How should I integrate my services/equipment ?

How can I best apply the products services and technology my company has ?

Is it the same for all types of supplier ?

Am I a strategic supplier to my customer(s) ?

Do I need special IT, and software ?

Do I have to do something differently ?

What about data security, Commercial issues and IPR ?

So what does this mean to a smaller supplier, operating in this global industry.

There are many questions, these are just some, but they provide a view of the range of issues to be considered

Such as the impact on an organisations competitive position, the relationship to their client, how they should integrate the capability they

have with their customer and their suppliers, do they need special IT and software, what will this cost in terms of investment, and how do they

protect their IPR when data is so readily merged to form a product, and hence what commercial terms will be needed.



3TS considerations

The smaller Aeronautical business applying VIVACE Collaborative methods has to consider :

What role does this business perform for its clients ?
Is integration by a hub directly, through a 1st or 2nd tier Supplier needed?

Is the business critical such that design and supply chain Data have to be provided as an integrated process directly to the client processes ? or

Can the business integration operate to agreed formats and tools, or simple data transactions ?.

Critically the smaller supplier needs to consider whether its services are what is the best means of integration, should they change to a more integrated Environment, this relates to the critical or strategic role they may play, or whether they operate in a competitive environment against comparable suppliers.

Hence do they need to and should they change approach, and can they apply the tools and formats that allows effective integration of information, either by integration in to the required IT based environment, or buy some other type of transaction.



Categories of businesses

So far consideration has been given to four scenarios :

1. Design and make organisations that supply components to the Aeronautical sector, e.g sensors, avionics items, smaller or specific mechanical items.
2. Design only companies, providing capability through resources And doing packages of work.
3. Consultancy businesses providing capability for specific Functions e.g technical analysis, or software..
4. Production or supply service businesses, providing a production Or specific process capability for hardware

To consider this we have taken four typical scenarios.

Design and make organisations

Design only companies, providing design or comparable technical analysis based services such as stress modelling

Technical or business management based consultancy organisations that undertake higher levels of work on specific technical or business issues, and advising

The primes and level one or two companies

Production service organisations who undertake specific production or possible other logistics based services



Design and make organisations

These businesses will need to consider their products against :

- Design processes, product change, cost modelling processes, supply chain planning and optimisation.
- Application within an integrated hub, and sharing of data through STEP or XML for Design modelling and simulation.
- The impact of product change and change impact processes and associated management software operated by the primes.

Businesses where their products are significant elements within the cost and definition of an aircraft or propulsion system will need to work with their customers and suppliers To define the most appropriate means of operating, whilst Protecting IPR and commercial information.

Design and make organisations will need to consider processes associated with product change and modelling and the data integration processes typically through STEP or XML.

Where the suppliers generate products that are significant in terms of value, cost, or the overall product definition, these businesses will need to agree

The most effective way of working to integrate their products, capability and knowledge, hence these businesses will also need to consider the issues associated with their IPR, and the impact of shared data and ownership of their element of the product.

This requires contractual considerations.

These suppliers may find that they are best suited to being integrated by hub networks etc to create the efficiencies and integration and control of data that may be required.



Design and make organisations

For Suppliers who's parts are :

- less critical in terms of cost or the function within the product design
- are typically in competition against comparable suppliers

Focus on ensuring the data they provide is to the required format with their customers.

It is likely that the integration in this context will be closer to current methods.

In all cases the IPR has to maintain protected within the contracts.

Suppliers who are less critical in terms of value, and cost, and maybe under more significant competition against comparable companies

Need to consider how they main gain any advantages, but critically how they may operate more efficiently if they have no other advantage., typically

focussing on how they may integrate their data efficiently in the required formats whilst protecting their IPR.

These businesses may find the approach they apply is closer to the current environment and working practices.



Design and Consultancy businesses

Design and Consultancy businesses generally focus on :

- Design processes, technical modelling, or cost analysis and
- Supported by knowledge management in some (larger project) cases.

Where the packages of work being undertaken or part of Integrated systems, the operations are more likely to be :

- By data hubs,
- using common software e.g modelling packages.

Smaller suppliers may be part of this either directly using these tools or by team integration in to a first or second tier supplier to complete the work.

Design and consultancy businesses focus on design and technical analysis processes, and typically may also do cost analysis.

Maintenance of knowledge is a critical element, and for long term survival and growth that knowledge has to be developed

To reflect the methods emerging and applied within the sector. Hence management of knowledge is a key issue within suppliers,

And in larger or strategic suppliers or supply chains there is a case for some interaction with their clients on this subject,

to understand lessons learned from the work undertaken, understand where specific expertise may be found and applied.

To enable the way of working proposed within VIVACE requires possibly the use of data hubs either directly or with a higher tier customer,

And certainly the use of common data formats and possibly common software for technical and design functions.



Design and Consultancy businesses

Consultancy businesses play a variety of roles.

- Simulation or technical analysis based organisations will need to understand and be involved with the processes undertaken by the prime/1st/2nd tiers by integration of personnel, and use of common tools.
- Similar requirements are likely to exist where consultancies support cost or more strategic based activities.
- Consideration of IPR will be required where 'background IPR' is involved to support a product/programme of work.

Consultancy businesses can be slightly different, they may provide a higher level of expertise which requires greater functional or physical integration with their clients.

Many of the requirements on technical and design based businesses occur, particularly in the integration with common tools, or possibly using their own bespoke software

But ensuring the outputs may be integrated with the clients.

Because of this IPR may be a greater issue, protecting background IPR, methods or software developed by the business, but being applied to support the customer, possibly

By an integrated data environment.



Production services

Suppliers of production and comparable services

- Provision of service lead times, costs etc are included in the Supply chain modelling and optimisation processes.

If we assume smaller suppliers are providing specific services it is unlikely this will need to be by integrated hubs, but will need to be by a format agreed with this customer in the same way as a component supplier will need to ensure schedule, logistics and cost data are provided.

Commercial protection of cost and process/schedule data has to be agreed with the customer.

Smaller Suppliers of production or logistics services or most likely to be involved by the supply of lead time, cost, and process/schedule information.

It would seem unlikely this data has to be integrated via hubs etc, although it would have to be to as et format if commonality of data input is required for scheduling, Optimisation and management purposes. The supplier will need to consider what data is required, how it will be used, and understand what it may mean to their position in the supply chain, particularly if it is in a competitive and optimisation environment.

Process information that involves IPR will also have to be protected as occurs currently, but recognise that it may be held in a shared data environment, hence the contractual agreements will need to be complete and comprehensive in relation to the data and service requirements.



Considerations

Application of methods as defined in VIVACE require consideration of the following questions by smaller suppliers:

- What is my role in the Aeronautical sector ?
- What integration do I need against my role e.g design, make, supply of services, other design or technical consultancy ?
..., and what functions do I integrate with i.e product change, production etc
- How am I best integrated with the virtual supply chain, directly via a hub, or through a higher tier company ?
- How can I ensure my input is defined properly in scheduling, Cost and supply modelling and optimisation ?

There is no single answer to the questions raised earlier, it depends on the business....

So going back to the questions raised earlier for smaller suppliers, there is no single answer.

But a range of questions will have to be considered against the collaborative engineering and shared data environments that a supplier may be required to operate, within

The supply chain.

Examples of these are : What is my role within the sector, and how is my business positioned strategically with my clients, and within the market place ?

What integration should I agree with my customer for the functions I perform ?

Do I need to be integrated virtually, should it be a long term functional arrangement, or project by project, and by IT commonality, or agreed data formats,

Or by placement of key personnel, or not at all ?

How can I ensure the data needed for scheduling, cost, supply modelling, or technical capability is properly defined and maintained, and what impact does

Optimisation have on the business ?, critically how does my business remain competitive in this sector ?



Thank you, and questions

I hope this has provided useful information on the research undertaken so far, and provided a view on the methods emerging, and the potential impact the methods emerging

from VIVACE may have on smaller suppliers and the considerations they will have to make.

If there are any questions I will try to answer them.

This session will now move on to the network environment, and then the IT security implications so I will hand over to Mats Lindbland from Volvo for the next presentation.

Thank you