



Act 2 Scene 1

***The 7 Day Proposal
and
Knowledge Management in
the 7 Day Proposal Process***

**Catarina Bovik,
Volvo Aero Corp.**

**Christian Johansson,
Luleå University of Technology**

Welcome to this joint presentation from the two VIVACE work packages Knowledge Enabled Engineering and Extended Jet Engine Enterprise Scenario. In this collaboration, the 7 Day proposal process, developed in the latter work package, has been used to form the frame for a presentation of the ideas concerning KNOWLEDGE MANAGEMENT.

My name is Catarina Bovik and I come from Volvo Aero. I will start this presentation by giving a short introduction to the ideas behind the 7 Day proposal process.

And then, we will then move into the field of knowledge management. Christian Johansson from Luleå University of Technology will present the theoretical ideas behind knowledge management. Special attention will be given to the new concept MATURITY. A concept that can facilitate the Virtual Enterprise collaboration in quotation processes.



The 7 Day Proposal Process

- Incentives**
 - **Reduced time**
 - **Confidence**
 - **Collaboration**

- Circumstances**
 - **Customer solution**
 - **Virtual enterprise**
 - **Fast pace in process**



VIVACE FORUM 2

© 2006 VIVACE Consortium Members. All rights reserved

Page: 2

24 October 2006

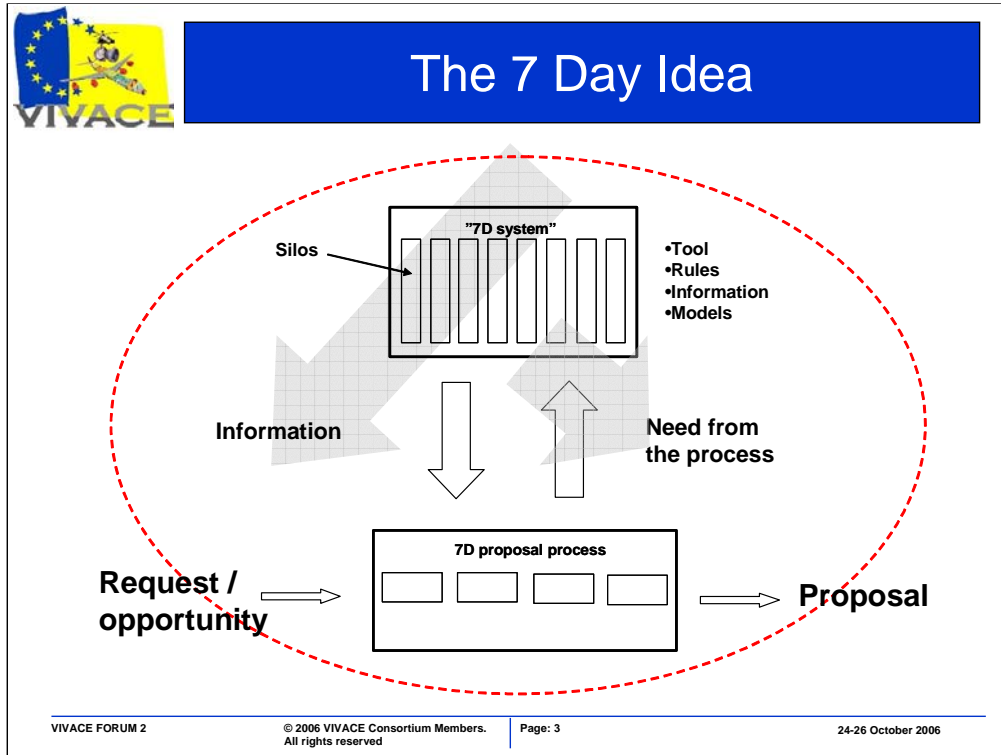
Why should we have a 7 Day Proposal Process? Well, if the total development time of an engine should be made essentially shorter, a contribution to the **reduced time** could be achieved in a phase preceding that of engine design. And that could be the work of producing a quotation regarding this engine. A second reason is to enhance the **confidence** in the outcome by working in accordance with a structured process. Another incentive is that a jointly agreed process can contribute to the actual **collaboration** between the involved companies and their individual staff-members.

Today, a proposal process *can* take a year, or even longer time, especially when many partners are to be involved in the process. And when those partners each has to rely on a numbers of sub-suppliers. Of course, this is not always the case. Quotations are produced very fast even today. But the conditions set up to form the scene for the 7 Day proposal are special. Mind these circumstances:

- The proposal should be produced within a **virtual enterprise**. By that we mean that several companies act as partners and jointly produce and sign the proposal.
- The proposal should regard a **customer solution**. That is a tailor-made solution, most likely including hardware, services and software.
- And, the proposal work should be performed at a very **fast pace**.

Before I continue to present the ideas forming the process, I must emphasize that the name "7 Day proposal process" should be seen as **a concept**. The proposal should not necessarily be produced in 7 days. The concept illustrates instead what I have just accounted for: the idea that several partner should be able to collaborate and produce a proposal to a customer within a considerably shorter time than today. It should also be a "confident" process. By that we mean that the outcome should be of high quality in order to facilitate for the decision makers involved. The process should also be able to be used in a number of situations. By partners on different level in the value chain. And proposals focusing on different kind of customer solutions, for example the re-design of a component or module to an engine, an aftermarket offering, or a complete new engine to a new aircraft.

Now, let's take a look on the 7 Day – components.



This slide illustrates the main idea forming the 7 Day Proposal: the process and the support system together.

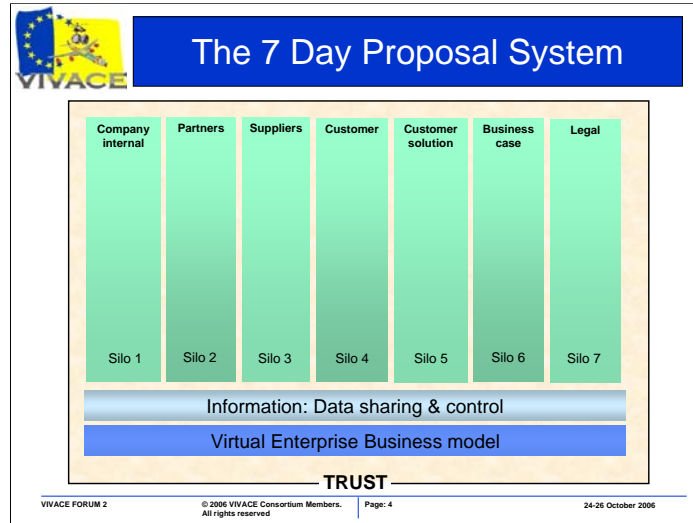
In order to produce a proposal, a series of activities have to be performed. That is the *Process* itself. You see it on the bottom of the slide.

But in order to perform the activities quickly and in a quality assured way – there is a need of a *Support system*. This system consists of different information, tools, rules and models to be used during the process.

We will now go on and take a closer look at these two components. First the support system and then the process.

It should then be noted that a "focal company" perspective have been applied. By that we mean that the collaborative work is seen from the perspective of one of the participating partners in the virtual enterprise. This implies that both the system and the process hold components that are internal to that focal company.

Now over to the system.



The 7 Day proposal system consists of the tools, rules, information and models that must be developed and agreed upon before entering into the proposal process. It is a platform for the practical work.

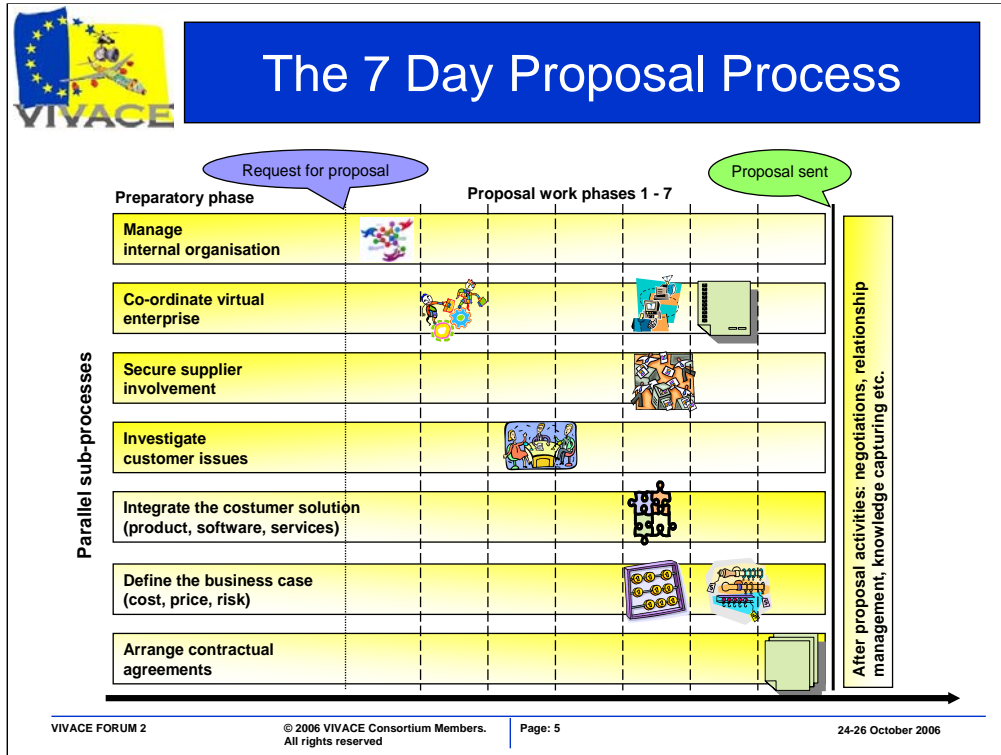
The elements of the system have been categorised according to their use situation and each group been put into what we call *system silos*, that is a kind of warehouses where the information is kept in stock, waiting to be used. On this slide you see the seven silos in green.

The first silo consists of issues connected to the focal company, that could be internal strategy, organisation and decision making. The next one is about tools for the practical co-operation with partners in the virtual enterprise. Number 3 is about the choice and involvement of sub-suppliers. Next we have tools connected to the customer, for example in order to elucidate customer needs and evaluate customer value. The fifth silo is about the customer solution, that is what is actually offered to the customer in terms of the package of hardware, services and software. Tools related to forming the business case are found in the next silo. This includes models for pricing, calculation of cost and evaluation of risk. The final silo is about legal issues.

The seven silos rest on a fundamental base built on two components, that is the two blue, laying fields on the slide. First, the partners that will form the virtual enterprise must agree on the *strategy and business models* to be applied in their future collaboration. This is important in order to share the same view of how to conduct business together in practice. Secondly, a shared way of using Information and Communication Technology is essential. When you receive the request for proposal – how will you *exchange and share data*? And how should the everyday *communication* be carried out?

The frame around the system visualises the final issue of the 7 Day proposal system. An issue of "softer" nature; an issue that only can be built by practical interaction by the individual human beings working together – and a factor that is inevitably influenced by their emotions. That is **Trust**. Trust is a crucial ingredients of the fast and collaborative practical work. If Trust does not exist, this fact will jeopardize the whole 7 Day proposal process.

We continue to the 7 Day proposal process.

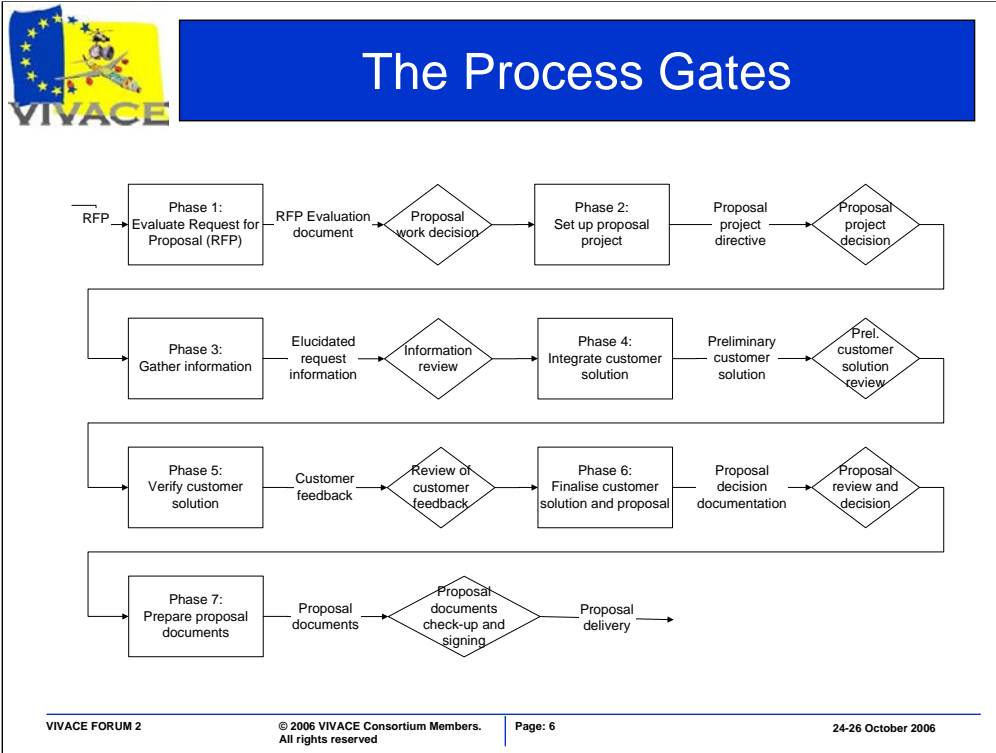


On this slide you see the basics of the 7 Day proposal process.

When the pace in the process is going to be high, it is necessary to define activities and checkpoints in the proposal process in advance. The outlined process starts when the Request for proposal is received from the potential customer. And it ends when the proposal is handed over.

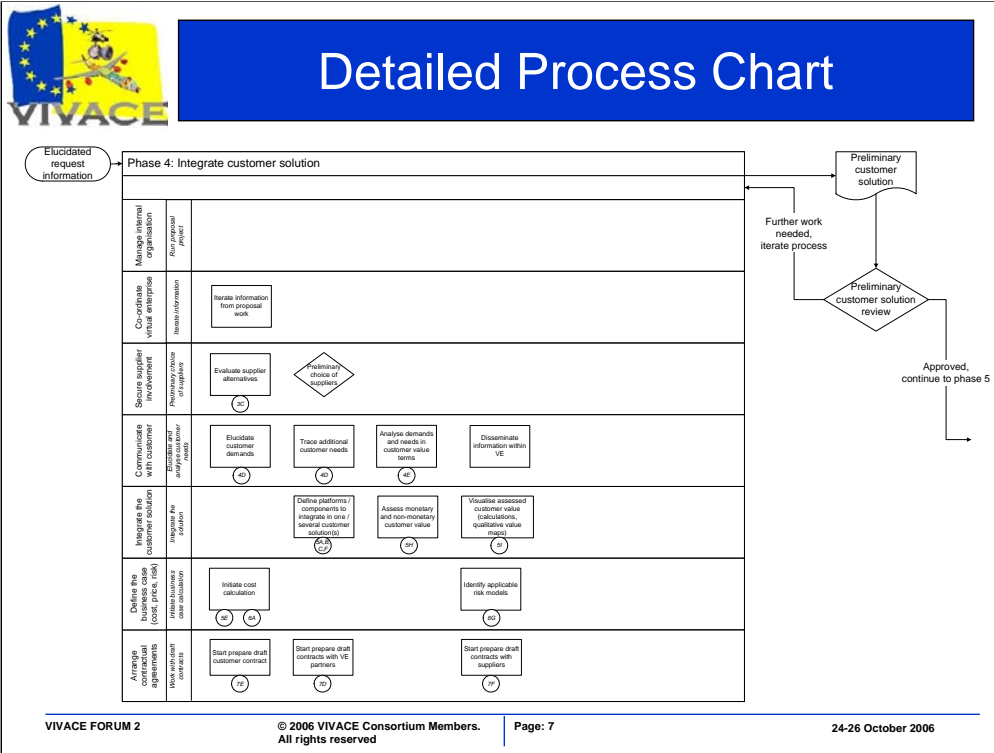
The process consists of a number of sub-process that should be carried out in parallel. Each sub-process focuses on a specific perspective of the proposal work. The line of activities – that is the horizontal lines on the picture – are divided in seven phases, separated by gates.

When we move on to the next slide the gates become clearer.



This process chart focuses on the seven phases of the process. And here the gates of the 7 Day process are elucidated.

The gates are included in order to save time and avoid unnecessary work by securing the outcome of each phase in the process. The result of the phase is to be presented and approved by decision-makers at the gate. The work will then continue in the next phase of the process.



An outline of each phase of the process has been suggested. This slide illustrates the fourth phase and you see a number of activities that have to be conducted within each sub-process. The circles that have been added below the activities identifies which tools from the 7 Day Proposal System that could be used in order to performed the activity.

The phase is ended by a gate where the outcome so far is scrutinised. If it is not approved, the work should iterate into the phase again. If it is satisfactory, the work continues into the next phase.



Facilitating the 7 Day Proposal

Surmounting some obstacles

- Lack of preparations
- Lack of access to previous learnings
- Lack of confidence



VIVACE FORUM 2 | © 2006 VIVACE Consortium Members. All rights reserved. | Page: 8 | 24-26 October 2006

We have now familiarized ourselves with the ideas and basics of the 7 Day Proposal Process and its Support System.

The question to be raised now is the following: How can this process be further facilitated in order to function in practice? As we see it, it is of major importance to overcome some obstacles.

The first is crucial for the 7 Day proposal approach. ... **Preparations**, that is the key. The fact is that preparations between the involved companies are vital. The Process has to be agreed upon. The Support System has to be filled with substance. And, not least, the Trust between the involved partners must have grown to a sufficient level. The legal part of this work is also essential. Both to formalize the co-operation in legal terms and to prepare terms and conditions for future collaboration – between the partners, with sub-supplier and of course with the customer.

Next issue moves us into the field of knowledge management. We have to make use of **learnings** from previous proposal processes and the actual provision of solutions in present and previously terminated businesses. To constantly fill the 7 Day Proposal Support System with these learnings is an obvious part of managing this knowledge. A shared software support will then become a major facilitator to the 7 Day Proposal Process.

The third issue to emphasize is the importance of achieving **confidence**. If decision-makers should be able to cope with the fast pace in the process, they must be sure of the quality of the information that is presented at each gate. Just to know that the agreed 7 Day Proposal Process and Support System have been used is of course contributing to the confidence. But are there any additional means?

Yes, there are. I now call upon Christian Johansson to speak and introduce us to the means of Knowledge management.



Knowledge Management in the 7 day proposal process

Presenter: Christian Johansson, LTU




Catarina's words from a knowledge perspective

Facilitating the 7 Day Proposal

Surmounting some obstacles

- Lack of preparations
- Lack of access to previous learnings
- Lack of confidence



VIVACE FORUM 2 | © 2006 VIVACE Consortium Members. All rights reserved. | Page 10 | 24-26 October 2006

- **The 7D process can be seen as a formalised and accelerated decision making process in a virtual enterprise.**
- **From a knowledge perspective – decision making can be improved by**
 - **Being better prepared (following a known route)**
 - **Using and comparing new proposal information with existing ones**
 - **Judging and evaluating the maturity of the proposal**



Topics

- Knowledge Enabled Engineering overview
- The Knowledge Lifecycle
- Use Cases & Knowledge Challenges
- 7 Day
 - Maturity of proposal approach
 - Why a Maturity Concept?
 - Where does the Maturity Concept come from?
 - How does the Maturity Concept work?
 - Process Maturity
 - Example of a Maturity Scale
 - Example of Maturity Concept
 - Conclusions and future work



Knowledge?

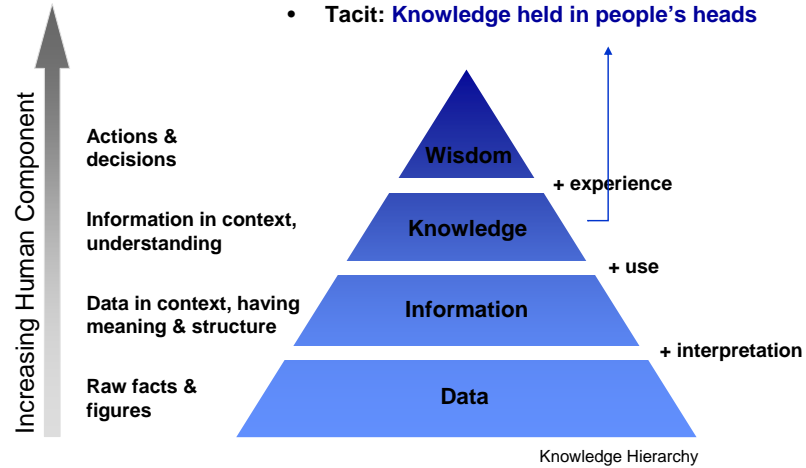
What do we mean when talking about knowledge?



What is Knowledge?

Types of Knowledge

- **Explicit:** Found in documents, databases and files
- **Tacit:** Knowledge held in people's heads

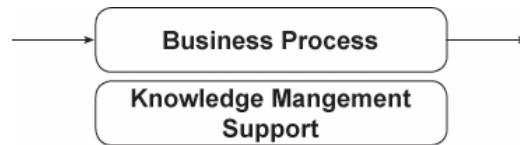




Knowledge Enabled Engineering (KEE)

Knowledge Enabled Engineering

The techniques and methods to consciously manage engineering related knowledge





Some symptoms of poor knowledge engineering support

- **Time wasted**
- **Re-invention of the wheel**
- **Same mistakes made more than once**
- **New employees taking a long time to become effective**
- **Knowledge lost when employees leave**

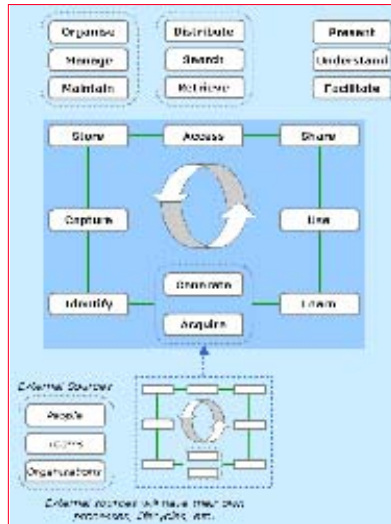


Organising Knowledge Engineering

How do we then organise Knowledge Engineering techniques and methods?



Knowledge Lifecycle



- Knowledge Engineering can be organised by using a Life Cycle approach to knowledge.




Knowledge Issues?

How do we then identify what are the Knowledge Issues in a process?



Identify Knowledge Challenges in Use Cases

Business Requirements  **Knowledge Challenges**

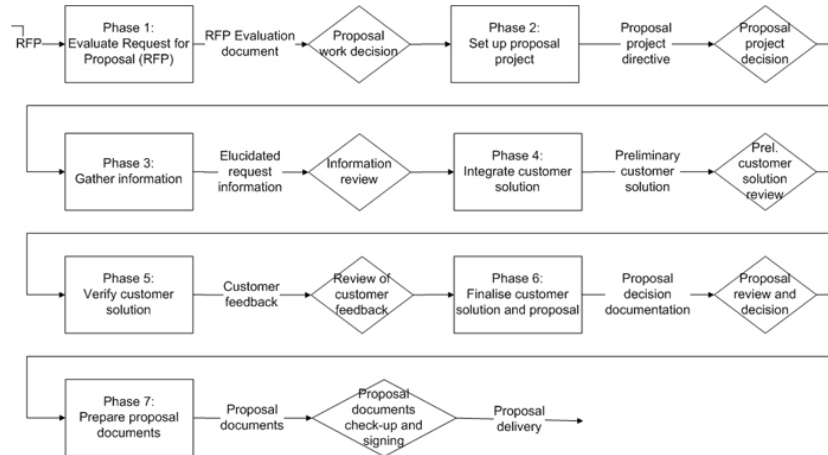
WP3.1 Use Case Analysis Table			
VIVACE GLOBAL		WP 3.1 LOCAL	
Business Requirement	Service Requirement	Knowledge-Issue	Knowledge- Challenge
{Something you can measure} in a {context}	To be able to {verb} on a {product/process} aspect within a {sub context}	We have to....	How can we...



7 Day Use Case

Scope:

Define and develop the process to produce a customised value proposal from an virtual enterprise in 7 days.





7D Process Maturity

Assessing the maturity of the 7D process is a way forward, but what do we mean with *Maturity*?



Why a Maturity Concept?

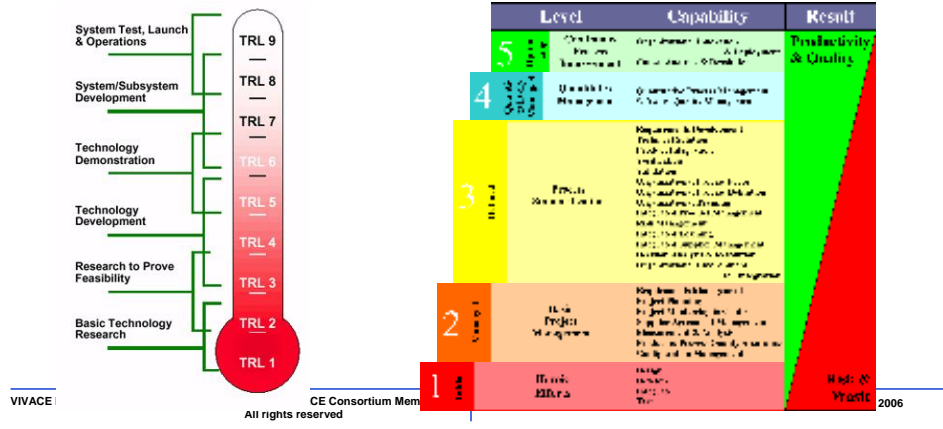
- The objective of the Maturity concept is to assess proposal risk and assure confidence for decision makers.

- We then need to
 - Formalise and structure the work
 - Gated process
 - Estimate and support the confidence and quality of the process
 - **Maturity Concept**
 - Help for decision makers at for instance a gate review
 - Make use of pre-existing knowledge
 - Lessons learned
 - Previous proposals (templates)



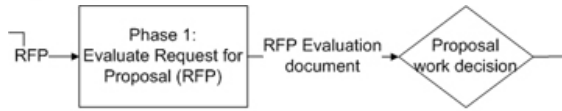
Where does the Maturity Concept Come From?

- **Technology Readiness Level (TRL), NASA**
 - Move through nine levels of Readiness
- **Capability Maturity Model (CMM), Carnegie Mellon University**
 - Developed to help software organisations improve processes
 - Identify current maturity and point to areas where they can improve





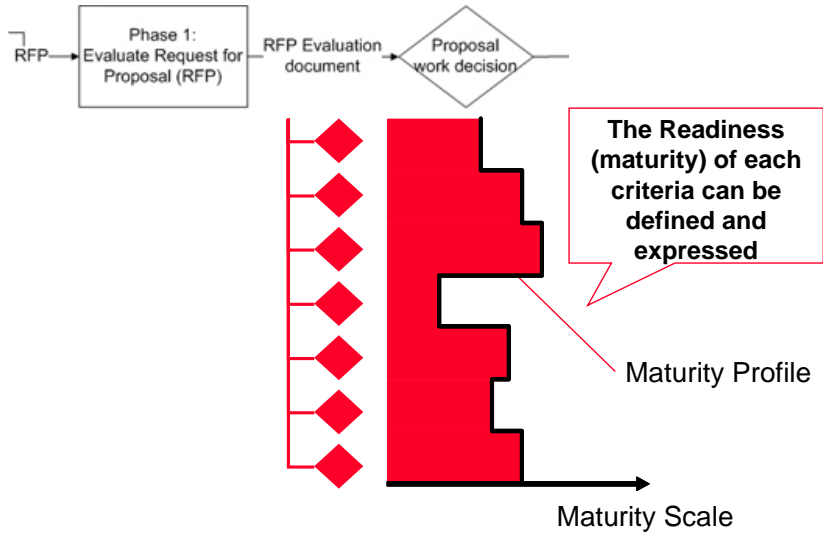
Process Maturity



To pass a gate a number of criteria has to be fulfilled

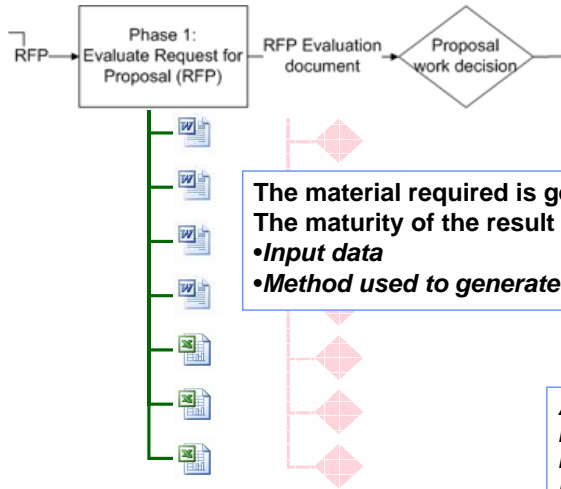


Process Maturity





Process Maturity





How does the Maturity Concept Work?

- **The Maturity relies on**
 - **Quality of Data**
 - **Confidence in activities performed**
- **The Criteria decides the level of maturity**
 - **Having a subjective estimation of the quality will not amount for a high maturity reading**
 - **Having a quotation from a partner will result in a higher maturity value**
- **Compare the "AS-IS" status of the process activities with "Criteria for pass" profile**
- **When the maturity is high enough the decision maker can make a confident decision**
- **The gate can be passed without having enough maturity but it will be noted**



Example of a maturity scale

- If criteria are of digital character, i.e. When a document exist or does not exist – maturity indicates the degree of completeness.
- If criteria are calculated/predicted values, such as "cost"- maturity indicate the quality of the expressed value.
- **Example of a Cost calculation maturity scale**
 - Level 1: Value/statement by user (subjective)
 - Level 2: Value/statement by user complimented by for instance a cost breakdown
 - Level 3: Value/statement given by existence of cost validation documents (Quotation by vendor)
 - Level 4: Value/statement given by cost simulation
 - Level 5: Cost committed by contractual agreement



Example of Maturity Concept

I have appended screenshot slides in another file.



Conclusions

 **Facilitating the 7 Day Proposal**

Surmounting some obstacles

- Lack of preparations
- Lack of access to previous learnings
- Lack of confidence



VIVACE FORUM 2 © 2006 VIVACE Consortium Members. All rights reserved. Page: 31 24-26 October 2006

- **The concept of maturity has been adopted to work as a decision support system for the 7D process system.**
- **The maturity profiles and levels needs validation.**
- **Maturity is a decision support instrument**
- **Help judge when a gate can be confidently passed in a process**



Future Work

- **Find criteria**
 - The next step is to identify and standardize the levels of maturity needed for each pass criteria – to define the decision profile for each gate.
 - This can be done in a Workshop with industry and academia
- **Develop the concept of Maturity**
 - Total Offer Readiness Level/Knowledge Readiness Level
- **Implement and test in industry**