Virtual Enterprise Planning Methods and Concepts

Report Workshop 2/Workgroup 2

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Abstract: see Quad Chart on page 2

1 THE NEED FOR VE PLANNING METHODS AND CONCEPTS

Global working can enable an enterprise to: (i) gain access to overseas customers; (ii) improve utilisation of idle capacity in a falling industry sector; (iii) search for new business (e.g. to offset effects of trading cycles); (iv) satisfy a need to develop new products with high margins (Brooke, 1986).

Global working requires: (a) a broad base of relevant skills; (b) a wealth of experience and practice in a number of local markets (Ohmae, 1995).

Bleeke and Ernst, (1995) describe a common way of meeting criteria and to form “partnerships” between existing businesses to provide new skills, experience and practice. However, establishing and exploiting such partnership places very significant requirements on the planning of such collaborations (Berry, 1999).

The following Quad-Chart (Table 1) summarises the work of the group that addressed those requirements. It identifies the approach taken to resolve the issues in this domain and proposes a concept for planning such collaborations. In addition it states some ideas for future work for testing and enhancing the proposed solutions.

The original version of this chapter was revised: The copyright line was incorrect. This has been corrected. The Erratum to this chapter is available at DOI: [10.1007/978-0-387-35621-1_43](https://doi.org/10.1007/978-0-387-35621-1_43)

Table 1: Working Group Quad-Chart

EI3-IC Workshop 2 <i>Enterprise Inter- and Intra-organisational En- and Integration</i>	Workgroup 2: <i>Virtual Enterprise Planning Methods and Concepts</i>	2002-January-23/25 Gintic, Singapore
<p>Abstract: With the move to global markets and the emphasis on core competencies the need for inter-organisational collaboration increases. Such collaborations usually try to exploit business opportunities usually at short notice as well. Support of this type of business is not yet well established (Schweiger, Very, 2001). This working group explored planning methods that will increase the efficiency of enterprise collaborations, which increasingly will deploy virtual environments (NIIP, 1998).</p>		<p>Major problems and issues:</p> <ul style="list-style-type: none"> – How to achieve more efficiency in the identification, establishment and exploitation of collaborations in virtual environments? – How to enhance known concepts like the GERAM framework and business process modelling to provide guidance during the life cycle of such inter-organisational relationships? – How to define languages and methods to describe business strategies and business models in relations to the life cycle phases of the GERAM modelling framework?
<p>Approach:</p> <ul style="list-style-type: none"> – Use the life-cycle concept and the GERAM modelling framework to structure the different tasks to be carried out during the life cycle of the collaboration – Focus on the identification and concept phases of the life cycle and define the relevant tasks both in relations to the envisioned market and the capabilities of the potential collaborators – with emphasis on SMEs – Identify relations between the different contributors and support the development of scenarios for proposed collaborations – Propose planning methods/processes to support the development of business models and business plans for the virtual enterprise – Extend the planning processes to cover strategic, tactical and operational planning for the virtual enterprise 		<p>Results:</p> <ul style="list-style-type: none"> – Identification of a set of common VE business planning activities: Market/Capability Analysis, Scenario Generation, Business Analysis, Business Plan Generation, Monitoring of BP Implementation – Identification of degree of concurrency between planning processes at different planning levels <p>Future work:</p> <ul style="list-style-type: none"> – Test concept in real practical applications: – Local SME environment (Printing enterprise network in Singapore) – Global industrial environment (in Automotive Industry) – Global environment (IMS project Globemen) – Investigate concept relations to concepts in human and management science – Investigate communication and negotiation needs with emphasis on human relations

2 OBSERVED NATURE OF VE FORMULATION

Virtual enterprises have a greater range of business opportunities to which they might respond than would a single company (Schweiger, Very, 2001). However before a response can be actioned and funded it must be properly justified and planned (Berry, 1999). VE Business Planning is focused on abstract, human enacted analysis and decision-making. Generally it requires at least one team of people with necessary clout and capabilities (Ohmae, 1995). Knowing about the kind of business processes that work in their market segment they must acquire knowledge about the capabilities of potential partners and reason about affiliations between partners with potentially complementary competencies that might operate competitively as a co-ordinate whole (Brooke, 1986).

In general VE Business Planning Process will be iterative in nature. The planning team(s) will assess alternative distributions of responsibility for product realisation amongst a selection of businesses. Thereby the business planning team will develop a business plan based on scenario analysis, which identifies a viable VE configuration or set of configurations.

The VE planning processes is based on the GERAM life cycle concept. The planning teams(s) must consider product, process and resource issues at a relatively high level of abstraction. They will investigate alternative scenarios trying to understand/identify key aspects of the opportunity. In so doing they will perform Middle-Up-Down analysis and preliminary VE design work at a high level of abstraction but will require enough detailed knowledge to realise financial justification. By such means the VE business planning team(s) will begin to flesh out “concept design” and “requirements definition” aspects of an enterprise configuration.

3 AGREE AIMS OF THE PLANNING TEAM

It was observed that GERAM conformant enterprise engineering architectures and methodologies (such as CIMOSA) can enable many aspects of VE formulation, implementation and evolution. It was assumed that:

- a) GERAM concepts and methods are sufficient to structure and support the set of projects generated as an output of the VE business planning process
- b) Developed descriptions of VE formation processes and configurations specified using GERAM concepts will prove useful when convincing partners to collaborate on business grounds.

To understand better the implications of (a) and (b) the agreed aim of workgroup discussion was to begin to flesh out common VE business plan-

ning activities and to achieve a better understanding of how typical business planning processes should be resourced.

Table 2: Common VE Business Planning activities

VE Business Planning Activities Needed	Typical Inputs	Typical Output
Market Analysis - Assess customer Requirements - Assess market characteristics - Anal. market share opport. etc.	Product & market data - which may be used as input to existing strategic planning meth. & tools	- What can to be made, when, in what sort of quantities & what their likely geographical distribution will be
Capability Analysis - Acquire knowledge of competitor capabilities - Acquire understanding of possible partner capabilities	Estimated capability & capacity data on potential partners - which may be used as input to existing analysis meth. & tools	- SWOT analysis of potential partners & suppliers relationships taking into account their relative location
Scenario Generation and Simulation - Capture descriptions of alternative product realisation processes - Capture descriptions of alternative VE configurations	Domain process models and as required detailed business planning models developed by designated detailed business planning teams	- Dynamic simulation models that allow experimentation regarding alternative operational process flows & VE configurations
Business Analysis - Value analysis of alternative operational process distributions among partners - Cost estimate of forming alternative partnerships	- Experimentation results, simulation models, - Process based cost-calculations related to partnerships	- Spreadsheet results & graphical summaries showing financial pro's & con's of value added processes & their distribution amongst different partners
Business Plan Generation -Specify business plans for staged project engineering - Harmonise activities of tactical & operational planning teams	- Validated processes and their distribution among partners - Plans of tactical and operational teams	- Business Plan specification - Harmonised team plan
Decompose/Release B Plans -Breakdown plans into fundable engineering projects - Release & manage projects within GERAM framework	- Stages of business plans/specification - Cost prerequisites - Project framework (GERAM)	- Project plans - Released projects with defined milestones according to GERAM
Monitor Plan Implementation Oversee & measure projects based on GERAM principles through their life-time	- Feedback from project milestones - Project plans	- Measurement and monitoring result sheets
Ongoing Change to B Plans Based on event value analysis recommend change tactical & operational process distribution - Modify business plans re-decompose into fundable engineering projects & release & monitor project outcomes	- Change requests from 'monitoring' or directly from 'partners' - Project plans - Monitoring result sheets	- Modified plans

4 COMMON BUSINESS PLANNING ACTIVITIES TO BE CARRIED OUT DURING VE PLANNING

Table 2 lists a set of common VE business planning activities identified by the working group. The table also lists typical inputs and outputs from the common activities. The need for multiple levels of planning was observed and the need to harmonise multiple team-based activity. Also time dependencies between activities were observed, as were opportunities to iteratively develop and evaluate alternative scenarios using established management techniques possibly supported by enterprise modelling tools.

For example the business processes of candidate configurations of resources can be represented and their dynamic behaviours modelled using business process simulation tools. This might lead to “what if” analysis focused on alternative distributions of processes amongst candidate partners and their business units. The application of suitable management theories would then facilitate selection amongst viable VE configurations, e.g. based on short, medium and long term financial and lead-time considerations.

5 NEED FOR CLEAR DIFFERENTIATION BETWEEN DIFFERENT TYPES OF PROCESS

With respect to VE business, tactical and operational planning the working group understood the importance of drawing clear distinctions between product, process and resource building business processes, and their planning, as follows:

- Business Planning Processes will be used to develop a business case for one or more VE configurations.
- Tactical Planning Processes will consider how business cases can be realised by considering the use & benefits of alternative product, process & resource building processes.
- Operational Planning Processes will test the technical, economic & practical feasibility of realising specified business cases.

Business, Tactical & Operational Planning Processes will generate product realising process specifications & will assess the use of alternative ways of configuring VE partner capabilities so that product realisation is achieved in the correct quantities, in the right place, on time and at acceptable quality levels. Business, Tactical & Operational Planning Processes will be resourced by suitable teams of agents (normally requiring at least one human agent).

Figure 1: Basic VE Business Planning Process

As illustrated by Fig. 1, invariably the complexity of VE business planning processes requires them to be resourced by appropriate human teams. In the case of a basic VE business planning process, a planning initiator driven by some event (like a business idea) will negotiate the formation of a planning team, which comprises planning agents with necessary business planning capabilities to resource the VE planning process required. Negotiating the formulation of teams will be complex and political but critical to the quality of the business plan generated. The agreed composition and objectives of the team will also depend upon the intended nature of VE partnerships, e.g. whether alliances, mergers and/or acquisitions are the likely outcome.

Fig. 2 illustrates derivatives of the basic VE planning process shown in Fig. 1. This shows that business planning teams will negotiate the formulation and terms of reference of more focused planning teams and will take into account their detailed findings.

Figure 2: Possible Concurrent VE Planning Processes

6 OPPORTUNITIES TO APPLY AND FURTHER DEVELOP WORKING GROUP FINDINGS

6.1 Case Study Work

The working group identified illustrative case study work that could apply and develop the VE business planning concepts identified in concert with established GERAM concepts and business process modelling tools. Three possible test cases have been identified, which have a global reach, but are located in different environments:

- Printer enterprise network currently established in Singapore
 - Global manufacture of car engines (COMPAG, COMPANION)
 - Industrial project currently carried out as an IMS project (Globemen)
- Action officers for each of the three test cases have been identified.

6.2 Interface with Established GERAM Concepts

The Working Group understood that improved formalisation of its VE planning concepts and their interface to established GERAM concepts would have potential to improve VE planning processes. Bearing in mind that a significant number of VE formation and implementation processes are ongoing around the world and that they will impact significantly on global economies, then enabling reuse of best VE business planning practice would also be of significant importance. A natural extension of this working group activity would therefore be to specify and test modelling constructs that formalise aspects of VE planning processes and their interfaces to enterprise engineering, and thereby to capture and promote examples of best practice.

6.3 Interface to Established Practice in Management and Human Sciences

VE business planning processes might be improved by generating reference models of the use of management theories, concepts and tools in support of VE formulation, implementation and evolution. Linked to this reference models describing team roles and responsibilities and the supporting methods, tools and infrastructure services they require could also be developed. Of fundamental interest might be a study of the way that planning teams adapt and evolve their tasks, behaviours, processes and structures so that co-ordinated planning is achieved amongst teams.

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