ResearchOnline@ND

University of Notre Dame Australia
ResearchOnline@ND

Business Papers and Journal Articles

School of Business

2006

Measuring Value Creation in a Virtual Enterprise

Peter Gall
University of Notre Dame Australia, Peter.Gall@nd.edu.au

Janice Burn

Follow this and additional works at: http://researchonline.nd.edu.au/bus_article
COMMONWEALTH OF AUSTRALIA
Copyright Regulations 1969
WARNING

This material has been copied and communicated to you by or on behalf of the University of Notre Dame Australia pursuant to part VB of the Copyright Act 1969 (the Act).

The material in this communication may be subject to copyright under the Act. Any further copying or communication of this material by you may be the subject of copyright protection under the Act.

Do not remove this notice.

Recommended Citation

Gall, P., & Burn, J. (2006). *Measuring Value Creation in a Virtual Enterprise*. **Paper presented at the 12th International Conference on Concurrent Enterprising. Milan, Italy, 26-28 June 2006.**

This Conference Paper is brought to you by the School of Business at ResearchOnline@ND. It has been accepted for inclusion in Business Papers and Journal Articles by an authorized administrator of ResearchOnline@ND. For more information, please contact denise.mclinden@nd.edu.au.

Measuring Value Creation in a Virtual Enterprise

Peter Gall, Janice Burn

Edith Cowan University, Perth, Western Australia, {p.gall, j.burn }@ecu.edu.au

Abstract

This paper reviews the literature in relation to virtual organisations and e-readiness. From this, the authors develop an instrument to measure the readiness of the organisation to embrace the concepts of virtual work and collaboration. The instrument is applied in an aspiring virtual enterprise to identify the extent to which they are ready to create value through a virtual organising model.

Keywords

Virtual Organisation, Virtual Organising, E Readiness, Virtual Readiness

1 Introduction

This paper tries to clarify some of the concepts related to the virtual organisation and to move away from the definition of a 'virtual organisation' as one with few or no tangible assets, existing in virtual space created through ICT [Warner & Witzel, 2002] towards the concept of an organisation which is 'virtually organised' employing ICT for the majority of its communication, asset management, knowledge management and customer resource management, across a network of customers, suppliers and employees [Venkatraman and Henderson, 1998]. The authors consider the concepts of virtual collaboration, virtual organisations and e-readiness; develop an instrument which can be used to evaluate organisational readiness to exploit virtual networks; and apply the instrument in a virtual enterprise.

2 Theories of Virtual Organisations

The shifting economic pressures of the 1990's have been characterised by the advent of new organisational forms; virtual enterprises, imaginary corporations, dynamic networks and flexible work teams [Raghuram et al, 1998]. The central role of alliances in e-business is such that businesses need to consider the concept of the virtual organisation and the implications of strategy formulation and delivery [Rowley, 2002]. This should occur not only within an organisation but also across the alliances that make the virtual organisation. Corporate strategy allows for potential acquisitions, joint ventures, coalitions, value added partnerships and tailored trade agreements and enables virtual communication on a hitherto unimagined scale [Talukder, 2003; Burn and Ash, 2003].

Partnerships in virtual markets are temporary alliances of enterprises that come together to share skills and resources in order to attend a business opportunity and whose cooperation is supported by computer networks [Vlachopoulou and Manthou, 2003]. Partnerships in a virtual

environment are enabled by sophisticated IT that makes business information transparent, seamless and within reach [Folinas and Vlachopoulou, 2001]. ICT enables the virtual organisation by mediating the dynamic assignment and coupling of requirements with the resources [Kishore and Mclean, 2002].

The virtual organisation of the future will be much more dynamic and sensitive to the need for tuning operational parameters of the enterprise as a whole, optimising the whole chain of value creation [Walters, 2004]. Enduring virtual organisations or enterprises do not simply appear, they are structured alliances that are based upon an acceptance that no one organisation will possess all of the capabilities or competencies required for success [Kay, 2000]. The degree of success is driven by how effectively organisations manage their degree of external readiness to virtualise.

3 E-Readiness

E-Readiness can be defined as the aptitude of an economy or an organisation to use internet based computers and information technologies to migrate traditional businesses to the new economy [Bui et al, 2002]. E-readiness criteria spans a wide range, from telephone penetration to online security to intellectual property protection, translating into whether a country's business environment is conducive to Internet based commercial opportunities.

There are at least five initiatives underway to conduct e-readiness assessments including those driven by UNDP, the ITU, The World Bank, The World Economic Forum and national donor agencies, including USAID, the UK's DFID and SIDA [APEC, 2000]. It has been suggested that APEC member economies should examine their strategies along six dimensions: immediacy, re-intermediation and innovation based economy, integration/internetworking, virtualization, convergence and discordance [Bui et al, 2002]. These can also be used to provide key insights on actions necessary within an organisation, where a well conceived virtual readiness assessment will map the organisation's regional and global position. Improving competitive strengths and promoting those areas where a country or company by its history, culture or nature, has an advantage over others, will further competitive advantage.

While a number of different instruments exist to evaluate the readiness of economies to utilise ICT effectively and participate in the global market through e-business initiatives or virtual trading; no such instrument was found to exist to evaluate the readiness of an organisation to 'virtually organise'. The authors reviewed three specific instruments as shown in Figure 1 and identified commonalities between all three which could then be used to create an extended instrument – The Virtual Enterprise Readiness Instrument (VERI).

4 Research Approach - Development of the VERI Instrument

An effective e-readiness assessment should introduce clear indicators to measure capacity and benchmark progress on the Connectivity, E-Leadership, Information Security, Human Capital, and E-Business Climate [McConnell, 2000]. McConnell [2000] examines 42 critical economies for their E readiness. E readiness measures the capacity of nations to participate in the digital economy. The model has been developed as an instrument that recognises the recent economic expansion that has enabled exponential growth in the value that comes from connecting more people and organisations to a global network. The survey size is optimum because these countries represent nearly three-quarters of the world's population and a quarter of the worlds GDP. The authors contend that these dimensions are equally applicable to organisations in

testing their degree of virtual readiness. Dimensions that measure connectivity, e-leadership, human capital and business climate are critical to virtual organisations.

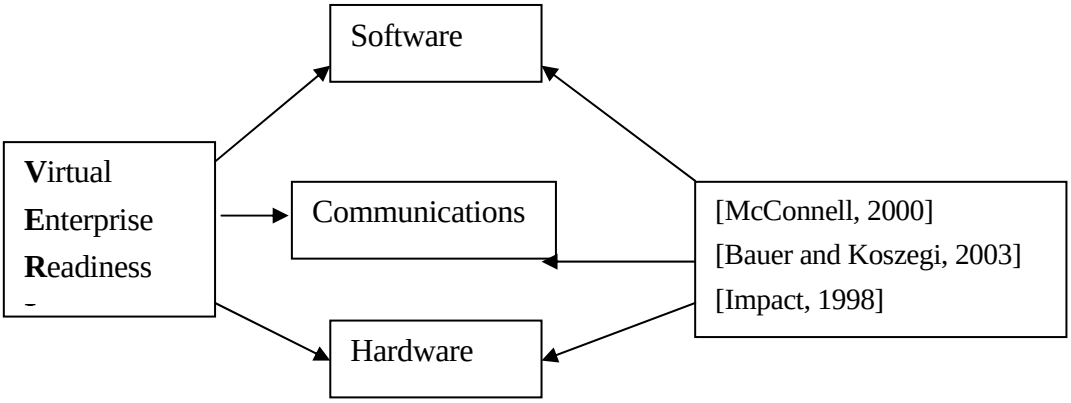

Figure 1: VERI

[Bauer and Koszegi, 2003] provide dimensions to identify the progress of an organisation in moving from a traditional viewpoint to an organisation which can graduate to a virtually ready structure. This model uses four structural dimensions; modularity and heterogeneity (differentiation), temporary and loose-coupled networks configuration, integration, and technology to measure the DV (Degree of Virtualisation) of 116 Austrian and German consulting firms in 10 European countries. The authors have identified key concepts and used them to construct the second component of the VERI model.

The Impact programme [1998] takes the process a step further by providing a tool for measuring organisational readiness using a sample consisting of the managers of 32 companies in 10 European countries. This model also uses four structural dimensions; dispersion, empowerment, restlessness and interdependence. The report outlines best practice in tackling these issues, which makes it the logical third model selected. An interesting statement in the report, lends credence to the development of an all encompassing readiness instrument. 'Virtuality is of course not an end in itself. It is an important ingredient of business strategy, and the overall business strategy must dictate the approach to virtuality, not vice versa' [Impact, 1998].

These three models form the basis for the development of the VERI instrument as shown in Table 1.

E Readiness (McConnell, 2000)	Gradual Virtuality [Bauer and Koszegi, 2003]	Measuring Virtuality [Impact, 1998]
Connectivity Communications Access Network Access Power supplies – supply chains	Technology ICT as enabler Coordination of activities Process value adding Virtual Corporation Temporary Loosely coupled network Combining core competencies Mutual Trust Coordination / modularized	Dispersion Number of physical locations Number of personal workplaces Technology facilitated mobility Ease of access to customers, suppliers Economic / political support Visibility to customer
E-Leadership VO promotion Automation processes Alliances Partnerships Universal Access	Configuration Independent configuration Uniting Collaborators Exploiting specific opportunities Standing network pool Historically motivated Structural cultural assimilation, Stability – change enabled	Interdependence Number of formal / informal relationships Level of external influence Staff / Line function Parallel line functions Product collaborations Cross-functional / cross process teams Internal / External SLA's
Human Capital Qualifications Cadre of skilled partners Knowledgeable Network Educational Systems Creativity& information sharing Workforce skills & efficiencies Intellectual capital Agile & Change approving Understanding the knowledge economy	Integration Heterogeneity (hesitation) Dynamical configuration of core competencies Shared organisational goals Trust / Cooperation / Coordination Exchange relationships High uncertainty High interdependence Shared output and process controls	Empowerment Defined accountabilities Decision levels Complexity, magnitude and scope of decision making Levels of repeat business Acceptance of empowerment Workforce skills investment
E Business Climate: Regulatory policies Standards & Rules Institutional arrangements Premiums for risk Effective competition Transparency & predictability of implementation Financial stability & soundness Electronic business transaction support	Modularity and heterogeneity: Satisfier modules Specific Requirements Core Competence Flexible & dynamic combination Unique value chains Competitive advantage opportunities Virtually increasing resources Know how endowment Increases in capacity Quality, flexibility, timing Synergistic cooperating partners	Restlessness: New products / services New markets entered New / changed processes New / changed job profiles New / changed interdependencies Response time Levels of stress Openness to change Change appraisal criteria Level of staff education

Table 1: three models form the basis for the development of the VERI instrument

5 Research Approach

The organisation chosen for this case study was a division of the Navy which provides maintenance, sustainment and servicing for a class of Australian Navy warships. The organisational structure consists of 17 group managers and a staff of 150. The authors identified the 17 group managers on the basis that they represented all the critical groups within the organisation charged with responsibility for every facet of operating and sustaining a class of Navy warship.

The research was conducted through three phases within this organisation. Firstly a pre-interview audit posing 30 questions was held with the 17 group managers focussing on identifying how important the groupings and dimensions and questions were to the case study organisation. Secondly one on one interviews were conducted with the 17 group managers to confirm the validity of the groupings and the questions posed. Finally the survey was revised based on their input and the instrument was tested again on the same 17 group managers posing the same thirty questions but focussing on whether the organisation felt that they were actually doing the things that the previous audit had identified as important.

6 Findings – Applying the VERI

In order to synthesise the three instruments all the constructs were identified separately and the components were then presented individually to a focus group of the 17 senior managers who grouped these into 'like issues'. After a first cut the groupings were reviewed and a collaborative grouping agreed. This formed the basis for the initial development of a questionnaire. This questionnaire (sample questions and results chart shown in Figure 2) acted as a pre-interview audit.

As part of this study all senior managers were asked to identify not only the 'importance' of the groupings to their organisation, but also to evaluate whether items were appropriately grouped. As a result, the actual VERI questionnaire was redesigned to more specifically reflect the degree of readiness which that organisation aspired to achieve. The redesigned instrument (sample questions and results chart shown in Figure 3) was then re-applied to the same set of managers to ascertain the actual extent to which these criteria were applied within the organisation. The VERI column in each chart represents the 30 questions asked.

The results of the pre-interview audit to establish whether or not the organisation felt that the questions asked <u>were important</u> were overwhelmingly centred on strongly agree and agree categories, reflecting where the 17 group managers felt they would like to be positioned.

VIRTUAL ENTERPRISE READINESS INSTRUMENT SURVEY

If a group under my control were to work effectively does with <u>other external companies to the DMO e.g. Tenix, Saab</u> using Information Communication Technologies it would be important that:

KEY *(Circle the response below which is closest to your opinion)*

SA = Strongly Agree **A** = Agree **D** = Disagree **SD** = Strongly Disagree **DK** = Don't Know

Enablement – Allow, Facilitate, Permit

1. Access levels to suppliers and partners are adequate	SA	A	D	SD	DK
2. My group has strategies in place to add value to collaborative relationships	SA	A	D	SD	DK

3. My group has the authority to facilitate collaborative relationships	SA	A	D	SD	DK
4. My group supports the development of core competencies	SA	A	D	SD	DK
5. My group has the resources it needs to collaborate effectively	SA	A	D	SD	DK

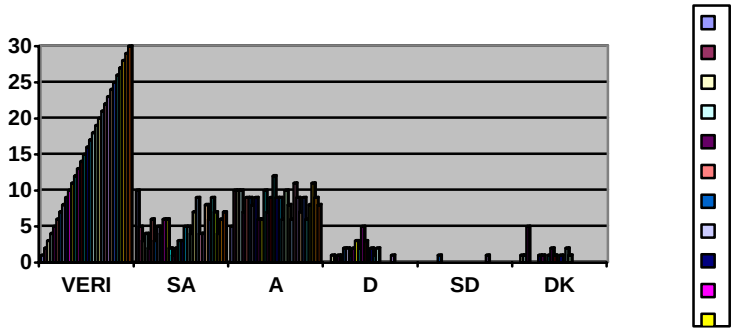

Figure 2: sample questions and results

However the results of the post interview survey to establish whether or not the organisation felt that it was actually doing the things identified are markedly different and provide an accurate representation of where the 17 group managers felt they were actually positioned.

VIRTUAL ENTERPRISE READINESS INSTRUMENT SURVEY

How effectively does your group work with other external companies to the DMO e.g. Tenix, Saab using Information Communication Technologies under the following headings:

KEY *(Circle the response below which is closest to your opinion)*

SA = Strongly Agree **A** = Agree **D** = Disagree **SD** = Strongly Disagree **DK** = Don't Know

Enablement – Allow, Facilitate, Permit

1. Access levels to suppliers and partners are adequate	SA	A	D	SD	DK
2. My group has strategies in place to add value to collaborative relationships	SA	A	D	SD	DK
3. My group has the authority to facilitate collaborative relationships	SA	A	D	SD	DK
4. My group supports the development of core competencies	SA	A	D	SD	DK
5. My group has the resources it needs to collaborate effectively	SA	A	D	SD	DK

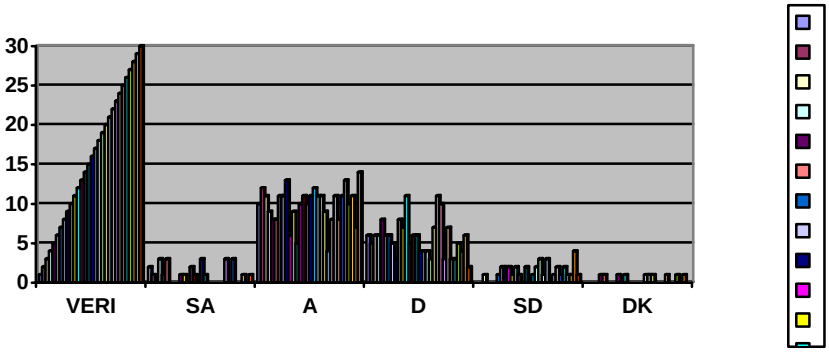

Figure 3: redesigned instrument

The significance of the instrument is validated by the fact that although initial pre-interview audit data overwhelmingly verified that senior managers agreed that the dimensions were important, when asked the question 'are your groups doing these things' the responses reflect the group managers true positioning. Using this data the authors were able to identify three sets of issues:

1. Those where greatest disparity existed between 'Important' and 'Doing' with the highest value being "Important'. Four issues were found to have extreme disparities – a difference greater than 15 suggesting a wide gap between strategic importance and actual practice. These become the **critical issues** for management to address and are assigned highest priority.
2. Those with greatest disparity between 'Important' and 'Doing' with the highest value being 'Doing'. All together five issues fell into this category but no extreme cases were found. These issues were highlighted for more in-depth examination of individual returns to ascertain whether particular groups in the organization were performing at a much higher level than others to skew rankings.
3. Those where the 'Important' and 'Doing' rankings appeared to be in alignment within one or two points. These issues are considered to be ones where strategic objectives are being met and assigned low priority for further investigation

Individual group analysis provides an opportunity for a final output from the exercise as it enables an assessment of each groups' degree of fit with the strategic virtualisation of the organisation. This forms the basis for senior management to identify key issues for change and future strategy.

7 Managerial and Organisational Implications

The VERI instrument was found to be a useful tool for management at several levels. Firstly, it assisted senior management in identifying and prioritising strategies for virtualisation at stage one; secondly, it forced managers to assess their performance against these priorities and finally it identified critical issues for strategic intervention. Robey et al., [2000] recommend using ICT to improve an organisations efficiency of, and ability for gathering and sharing information across geographical (external) and functional (internal) divides, enabling greater horizontal and vertical connections among employees and corporate resources. Sharing information across geographical divides could be expressed as a readiness to collaborate while functional divides refer more to internal capabilities and could be expressed as operational preparedness. The VERI instrument helps managers to align their readiness to virtualise and the next step in this research is to develop a similar instrument to assess preparedness and to allow comparisons between the external and internal models.

8 Conclusion

Ongoing research is being undertaken within this large organisation where 'virtual organising' is espoused as a principle and early results have shown the instrument to be highly effective and found very valuable by the participating managers.

Applying the pre-interview audit, interviews and subsequent redesign of the instrument to other organisations would result in significantly different outputs at each stage of the process and enable assessment of the degree of fit with strategic virtualisation on a never before imagined

level. The VERI model has the potential to become the template for exploitation not only of an organisations degree of virtuality, but also an enabler for all ICT convergent industries to enhance their readiness to collaborate in developing globally competitive packaged solutions.

References

Asia Pacific Economic Cooperation (APEC). 2000. *E-Commerce Readiness Assessment Guide*. Version 5.0, http://www.ecommerce.gov/apec [5 November 2000], Accessed 15 April 2003.

Bauer, R. & Koszegi, S.T. 2003. Measuring the degree of virtualization. *Electronic Journal of Organizational Virtualness* [Online], 5(2):26-46. Available from: http://www.virtualorganization.net/ [Accessed: 23/11/2003].

Bui, T., Sebastian, I., Jones, W. and Naklada, S. (2002), "E-Commerce Readiness in East Asian APEC Economies", *The Pacific Research Institute for Information Systems Management (PRIISM)*, Honolulu, Hawaii, USA.

Burn, J. M. and Ash, C. (2003). Assessing the benefits from e-business transformation through effective enterprise management, *European Journal of Information Systems*, Vol.12, 4, 297-308

Folinas D., Manthou V. and Vlachopoulou M., (2001). Logistics Service Management in Virtual Organization Environment: Modelling Systems and Procedures. Proceedings of 17th International Logistics Congress: Logistics from A to O, Thessaloniki, pp. 127-139.

Group 4 of Project ACHIEVE (1998) Exploiting the Wired-up World: Best practice in managing virtual organisations. The report of Working 4. The IMPACT Program. http://www.achieve.ch/, Accessed 22 March 2003

Kay, J. (2000). Strategy and the delusion of grand designs. London, Prentice Hall.

Kishore, R. and E. McLean (2002). "The Next Generation Enterprise: A CIO Perspective on the Vision, its Impacts and Implementation Challenges." Information Systems Frontiers **4**(1): 121-138.

McCONNELL INTERNATIONAL (2000): Risk E-Business: Seizing the Opportunity of global readiness. http://www.mcconnellinternational.com/ereadiness/EReadinessReport.htm, Accessed 08 August 2003

Raghuram, S., R. Garud and B.M. Wiesenfeld (1998) Telework: managing Distances in a Connected World, In: http://www.strategy-business.com , *First Quarter Journal* , BA&H, Accessed 18 September 2003.

Robey, D., Khoo, H.M., and Powers, C., "Situated Learning in Cross-Functional Virtual Teams," *IEEE Transactions on Professional Communication*, 43 (1) 2000, 51-66; and *Technical Communication*, 47 (1) 2000, 51-66. (Joint Special Issue)

Rowley, J. (2002). "Synergy and strategy in e-business." Marketing and Planning **20**(4): 215-222.

Talukder, M. (2003). "The perception of professionals and management personnel on the virtual organisation." The Journal of Computer Information Systems **43**(3): 92-100.

Venkatraman, N.;Henderson, John.C. (1998). Real Strategies for Virtual Organizing. *Sloan Management Review*, 40,1, 33-48.

Vlachopoulou, M. ; Manthou, V. (2003). "Partnerships alliances in virtual markets." International Journal of Physical Distribution & Logistics Management **33**(3): 254-267.

Warner, M.;.Witzel, M. (2004). "Managing in Virtual Organizations". Thomson Learning, London.

Walters, D. (2004). "New economy - new business models - new approaches." International Journal of Physical Distribution & Logistics Management **34**(3/4): 219-229.