

# Encyclopedia of Networked and Virtual Organizations

*Goran D. Putnik*  
*University of Minho, Portugal*

*Maria Manuela Cunha*  
*Polytechnic Institute of Cávado and Ave, Portugal*

Volume III  
Pu–Z

Information Science  
**REFERENCE**

**INFORMATION SCIENCE REFERENCE**

Hershey • New York

Acquisitions Editor: Kristin Klinger  
Development Editor: Kristin Roth  
Senior Managing Editor: Jennifer Neidig  
Managing Editor: Sara Reed  
Copy Editors: Amanda Appicello, Alana Bubnis, Ashley Fails, April Schmidt, Katie Smalley, and Larissa Vinci  
Typesetters: Jeff Ash and Jamie Snavely  
Cover Design: Lisa Tosheff  
Printed at: Yurchak Printing Inc.

Published in the United States of America by  
Information Science Reference (an imprint of IGI Global)  
701 E. Chocolate Avenue, Suite 200  
Hershey PA 17033  
Tel: 717-533-8845  
Fax: 717-533-8661  
E-mail: [cust@igi-global.com](mailto:cust@igi-global.com)  
Web site: <http://www.igi-global.com/reference>

and in the United Kingdom by  
Information Science Reference (an imprint of IGI Global)  
3 Henrietta Street  
Covent Garden  
London WC2E 8LU  
Tel: 44 20 7240 0856  
Fax: 44 20 7379 0609  
Web site: <http://www.eurospanonline.com>

Copyright © 2008 by IGI Global. All rights reserved. No part of this publication may be reproduced, stored or distributed in any form or by any means, electronic or mechanical, including photocopying, without written permission from the publisher.

Product or company names used in this set are for identification purposes only. Inclusion of the names of the products or companies does not indicate a claim of ownership by IGI Global of the trademark or registered trademark.

Library of Congress Cataloging-in-Publication Data

Encyclopedia of network and virtual organization / Goran D. Putnik and Maria Manuela Cunha, editors.

p. cm.

Summary: "This book documents the most relevant contributions to the introduction of networked, dynamic, agile, and virtual organizational models; definitions; taxonomies; opportunities; and reference models and architectures. It creates a repository of the main developments regarding the virtual organization, compiling definitions, characteristics, comparisons, advantages, practices, enabling technologies, and best practices"--Provided by publisher.

ISBN 978-1-59904-885-7 (hardcover) -- ISBN 978-1-59904-886-4 (e-book)

1. Business enterprises--Computer networks. 2. Virtual corporations. 3. Virtual reality in management. 4. Management information systems. 5. Knowledge management. I. Putnik, Goran, 1954- II. Cunha, Maria Manuela, 1964-

HD30.37.E53 2008

658.4'038--dc22

2008004512

British Cataloguing in Publication Data

A Cataloguing in Publication record for this book is available from the British Library.

All work contributed to this encyclopedia set is original material. The views expressed in this encyclopedia set are those of the authors, but not necessarily of the publisher.

*If a library purchased a print copy of this publication, please go to <http://www.igi-global.com/agreement> for information on activating the library's complimentary electronic access to this publication.*

# Strategies for Virtual Work

**Paul Jackson**

*Edith Cowan University, Australia*

**Jane E. Klobas**

*Bocconi University, Italy*

*University of Western Australia, Australia*

## INTRODUCTION

As capital searches for new markets, greater efficiencies and competitive advantage, time, space and the boundaries of the firm become strategic enablers rather than operational hindrances. Mass customization, the ability to develop and deliver exactly what a customer needs, requires intimacy with their operations and the active participation of customers and customer communities in the design of solutions (Venkatraman & Henderson, 1998). The mobilization and leveraging of knowledge resources to create ideal solutions requires building teams of experts who are motivated, empowered and connected. These experts can be at home, in other offices, in other companies, or in other countries. And the sourcing of assets required to support production and delivery is no longer sacred: complementarity of resources, configured in temporary networks, is sought, even if those resources come from competitors. The solution, the fit for the customer, is the key to success, not the historical reliability of the tried and true business process (Castells, 2001).

Elements of virtuality have existed long prior to the coining of the term, ‘virtualization’. Outsourcing of the supply chain, sharing of work amongst distributed participants, forming consortiums, working from home: irrespective of the form, there have been instantiations of the virtual organization or networked enterprise for many years, in some cases, centuries. What is perhaps different today is the widespread conscious characterization of virtual organizing as a firm strategy, where in order to enhance productivity and profitability, the boundaries of the office building, the working day, the company and the nation state have become porous. Further, the information technologies that enable this transformation allow a hitherto unimagined displacement of time and space.

Here we focus upon “virtual work,” a term which commonly describes an approach to managing and

configuring organizational human resources and work activities beyond the spatial, temporal and legal boundaries of the firm. This “virtual work” runs a spectrum from working-from-home or at a client site to the distribution of discrete parts of the supply chain to anywhere in the world. It is a response to competitive market conditions where customers demand flexibility, responsiveness and high performance. The rapid development of powerful digital communication and collaboration technologies has accelerated the physical distribution of staff and the dispersal of work teams to remote locations where the greatest leverage can be obtained from effort. Virtual working promises many benefits but brings its own set of challenges: the maintenance of control, conformance to organizational goals and performance standards, maintenance of identity and purpose, to name a few. In particular, the problem of creating and using knowledge resources becomes more challenging: how will remote knowledge be integrated into the procedures and folklore of the firm and how will knowledge be located and accessed by remote staff when it is needed?

While there has certainly been an emergent aspect to the virtual organization and its various manifestations, a virtual environment poses greater challenges to effective work than non-virtual and therefore requires special management attention. Therefore, we present a practical framework for the crucial process of envisioning the form of virtual work that a particular organization may require and identifying key objectives and indicators. We show how to map progress towards the required form and degree of virtual work, and how to identify the capabilities necessary to achieve that form. We concern ourselves with those forms of virtual organization that involve remote work within the broadly defined boundaries of a single firm (as distinct from a virtual firm consisting of multiple individual firms). We show how the framework can be used with senior management to conceptualize and guide the process of virtualization at the company.

## BACKGROUND

The literature points to five common enabling capabilities for successful implementation of the virtual workplace: leadership and vision, virtual work design, employee skills and characteristics, technology, and economics. They are summarized in Table 1.

## A MODEL FOR ENVISIONING VIRTUALIZATION

Managers are required to confront, assess, decide and implement appropriate methods of virtual organizing. Sometimes these processes are strategic, sometimes they are emergent. In either case, information and models are required to assist either in explicit decision-making or the monitoring and evaluation of emergence. In analyzing the information required for effective virtual organizing, there appear to be three classes of information required: information relating to the strategic need of the organization to virtualize in some way,

information relating to the current state of virtualization in the organization, and information about the organizational capability for virtual organizing. Each of these is discussed below, followed by a model that permits evaluation of the alignment of the organization's goals, state and capabilities for virtualization.

## Information Relating to the Strategic Need of the Organization to Virtualize

The derivation of an appropriate strategic response to environmental or operational factors can be couched in terms of virtualization. This will depend on the ability of management to understand the potential and relevance of virtuality to solve problems of customer service, competitiveness, efficiency, and employee satisfaction. It would be unusual if a strategic response consisted solely of actions characterized as virtualization. When strategic responses have been articulated and collated, and the consequences have been teased out, then indicators of the nature and extent of envisioned virtualization can be identified. For example, is

*Table 1. Enabling dimensions and capabilities for virtualization*

Dimension	Attributes	Authors
1. Leadership and vision	Clear vision and purpose of the leader; Leader has attributes which motivate knowledge workers ; Continuously communicates and reinforces a consistent message; Implements effective change management; Builds an environment of high trust; Empowerment of staff, limit command and control	Pan & Scarbrough, 1999; Drucker, 1999; Pfeffer, 1990; Senge, Fall 1990; Bal & Teo, 2000
2. Virtual work design	Well designed and logical; Well documented and available; Roles and responsibilities are defined and clear; Role orientation not job description; Decision criteria are clear; Interdependencies are defined and clear; Timelines and milestones are clear; Process rather than functional orientation; Self-managing teams	Fritz, Narasimhan, & Rhee, 1998; Malhotra, Majchrzak, Carman, & Lott, 2001; Nemiro, 2000; Crandall & Wallace, 1998
3. Employee skills and characteristics	Required skills and competencies are present; Training and advice are available when required to bridge the gap; Measurement of employee performance is transparent and clear; Incentives and rewards are present for good performance; Collaboration is fostered through communities and 'mentors'; Induction explicitly planned for virtual team members.; Flexible, self-motivated, team player	Nemiro, 2000; Venkatraman & Henderson, 1998; Brown & Duguid, 2000; Crandall & Wallace, 1998
4. Technology	Infrastructure is present; Tools are available for collaboration; Tools are available for supporting work processes; Knowledge-based systems are available; The workplace is reflected in cyberspace; Real time information is available	Alavi & Tiwana, 2002; Fritz, Narasimhan, & Rhee, 1998; Yap & Bjorn-Andersen, 2002; Steel, 2003; Malhotra, Majchrzak, Carman, & Lott, 2001
5. Economics	Well thought through and understood; Clear link between economic requirements, drivers and capabilities; Cost / benefit is understood; Commitment to high performance rather than cost cutting	Crandall & Wallace, 1998; Warner & Witzel, 2004

virtualization in the organization defined in physical, temporal or structural terms, such as percentage of time spent outside the office or the percentage of tenders that involve non-permanent staff, or is it defined in psychological terms such as shared commitment to a set of common values regardless of the location at which staff members work, or is virtualization a combination of both? Indicators—which may themselves change over time as the form of virtualization itself changes—can be used to describe the envisioned state.

### Information Relating to Current State of Virtualization in the Organization

Depending upon the type of virtualization envisaged, management can ascertain the current level of virtualization using the indicators developed to describe the envisioned state of virtuality. Figure 1 presents a sample scale for the general virtual rubric of telecommuting. The diamond marks the envisaged state of virtuality, while the dot marks the actual state.

### Information about the Organizational Capability for Virtual Organizing

Having defined the nature of the desired virtual organization and how to measure how close the organization is to it, we require a way of measuring capability to bridge the gap. To be effective, virtual organizing requires capabilities beyond those of the non-virtual organization. Most obviously, technology becomes a critical enabler. But the other factors described earlier and in Table 1 are also critical: leadership, business processes, employee skills, and economics. An analysis of the capability of an organization to virtualize would ask questions such as:

- Do we have the technology to be able to communicate with distributed staff?

- Do staff have the skills to use it?
- Are our business processes clear enough and modular enough to allow work distribution?
- Do staff have a virtual mindset which accepts low face-to-face communication?

## A VIRTUAL ALIGNMENT MODEL (VAM)

Information about the envisioned form of virtualization, the current state, and capabilities for operating virtually, taken together, can be used to evaluate the organization's progression towards the desired levels of virtual work. Table 2, derived from Klobas and Jackson (2007), demonstrates how this might be done.

Knowing that goals, state and capability are aligned, suggests that no specific action needs to be taken, but any discrepancy suggests that the organization may be exposed and need to take action to improve capability or reduce unnecessary overheads.

## USING THE MODEL

In order to use the virtual alignment model, some form of measurement is required of the levels of strategic need to virtualize, the current level of virtuality and the capability to operate effectively in the virtual mode envisioned by the organization.

1. Identifying strategic drivers for virtuality and ascertaining particular needs can be done in a number of ways, but the usual strategic planning methods such as SWOT, Porter's five forces, cognitive mapping conducted in managements workshops are applicable for eliciting strategic drivers and goals. Table 3 shows the outcomes of a management workshop which ascertained

Figure 1. Sample scale for comparison of actual and envisaged levels of telecommuting



Low	Medium 	High 
- Single office - No working from home at all and no travel for most staff	- Some working from home - Some workers in partner offices - Workers come to office at least weekly	- Workers often at home and on the road - Hiring not limited by location - Virtual workspace supplied

Table 2. Virtual alignment model (VAM)

Strategic need for virtuality	Current level of virtuality	Capability to operate virtually	Assessment
High	High	High	An ideal state of alignment, where the resources for operating virtually are at the service of a virtualized workforce
Low	High	High	There is possibly over-expenditure and resource committed to maintaining an unnecessary preparedness for virtual operations. Further, there is possible strategic exposure from being too virtual.
Low	Low	High	There is possibly over-expenditure and resource committed to maintaining an unnecessary preparedness for virtual operations.
High	Low	High	The strategic need for virtualization is not being met and the infrastructure is not being sufficiently utilized. There is a job of work to do to implement virtualization
Low	Low	Low	An ideal state of alignment, where there is low resource commitment and no superfluous virtualization occurring.
High	Low	Low	Major effort is required to provide the necessities for virtualization and then transform the business to the level strategically required.
Low	High	Low	Low preparedness and low requirement, and exposure from over-reach.
High	High	Low	Exposure through an ill-prepared and inefficient context for virtualization

that the following strategic goals were required (Jackson & Klobas, 2005):

- High dispersal of staff through geographical locations and close to customers
  - High use of information technologies to accomplish work effectively
  - High integration between head office and external staff to facilitate support
  - Cost effectiveness is maintained or improved
  - Flexibility and responsiveness to customer needs, including ability to offer new services to clients
  - Attraction and retention of the best staff through positive organizational culture
  - Maintain a high level of organizational coherence, including sense of belonging, and shared values and goals
  - A high level of virtual mindset—the workplace is everywhere
2. Once the form of virtualization has been articulated, a frame of reference (Table 4) can be established within which measurement instruments can be developed and an initial impression of the state of virtualization along key dimensions can

be obtained from participants’ responses to the workshop exercises. The indicators can be used to conduct a self-assessment of the current level of virtuality in those areas which the management workshop has declared important. The indicators in Table 4 were developed to measure achievement of the goals described in step 1. They are divided into *organizational* indicators, indicators mostly derived from direct observation at the level of the organization, and *individual* indicators, measures of individual members of the organization’s attitudes to working in the organization and acceptance of the technologies designed to support virtualization.

3. The final step is to ascertain the capabilities required to achieve the objectives of virtualization. These capabilities can be derived from the literature summarized in Table 1: leadership and vision, virtual work design, management and employee skills and characteristics, technology, and economics. It is important to identify those capabilities that are relevant to the anticipated form of virtual workplace. So for example, an objective of high staff dispersal would lead to a requirement for well-designed virtual work processes and ICT systems, although the details would depend upon the contingent interdependence of

*Table 3. Indicators of envisioned level and current state of virtuality*



<p><b>Organizational</b></p> <p><i>Dispersal of staff</i></p> <ul style="list-style-type: none"> <li>- Days out of the office/total days</li> <li>- Proportion of staff outside Head Office (HO)</li> <li>- % of time spent traveling</li> <li>- Proportion of staff whose communication patterns demonstrate they are ‘connected’ to a community of colleagues in the organization</li> </ul> <p><i>ICT</i></p> <ul style="list-style-type: none"> <li>- Installed ICT to support virtual work</li> <li>- Number of staff using each specific functionality of installed IT (e.g. forums, VoIP, repository)</li> </ul> <p><i>Workflow and management</i></p> <ul style="list-style-type: none"> <li>- Procedures explicitly incorporate staff outside HO</li> <li>- Management practices explicitly include staff both inside and outside HO</li> </ul> <p><i>Cost effective</i></p> <ul style="list-style-type: none"> <li>- Square metrage of office space per employee</li> </ul> <p><i>Offer new services to clients</i></p> <ul style="list-style-type: none"> <li>- Number of clients to whom virtual organization solutions are provided</li> </ul> <p><i>Operations</i></p> <ul style="list-style-type: none"> <li>- Perceived ability to be more flexible and responsive to the market in terms of competence, countries and clients</li> <li>- Perceived ability to attract and retain the best people wherever they are</li> </ul> <p><b>Individual</b></p> <p><i>Culture, commitment, values and goals</i></p> <ul style="list-style-type: none"> <li>- We act in accordance with the company’s expressed corporate values</li> <li>- There is a good cooperative spirit in our Department</li> <li>- I feel a part of (the company) culture</li> <li>- I like to do things the (company) way</li> <li>- I work to meet (the company’s) quality demands</li> <li>- I know what is going on in (the company)</li> <li>- I get quick replies to my questions</li> <li>- Sense of belonging and corporate identity</li> </ul> <p><i>Attractive place to work and participate</i></p> <ul style="list-style-type: none"> <li>- This (the company) is a good place for me to work</li> <li>- The administrative framework is in place to ensure fair handling of my appointment</li> <li>- I have the skills I need to represent (the company) effectively to clients</li> <li>- I am pleased with the contribution I am making to (the company)</li> <li>- I have the contacts I need to be appointed to my next project for (the company)</li> </ul> <p><i>ICT and information</i></p> <ul style="list-style-type: none"> <li>- Technology accessibility</li> <li>- Technology acceptance</li> <li>- Access to information needed for the job</li> <li>- Knowledge management</li> </ul> <p><i>Virtual mindset</i></p> <ul style="list-style-type: none"> <li>- Doing things virtually is ‘business as usual’</li> </ul>
--



Table 4. Virtualization planning template

Strategic need for virtuality	Current level of virtuality	Capability to operate virtually
<b>Data gathering and analysis</b>		
Indicators are those listed in table 3 (dispersal of staff, ICT, workflow etc)	Indicators are those listed in table 3 (days out of the office / total days)	Indicators are measures of dimensions based on those in table 1: - Leadership and vision - Business processes - Management ability - Staff ability - Virtual mindset - Technology - Economics
<b>Assessment</b>		
"Our need to virtualize is high/medium/low and virtuality for us means ..."	"Our current level of virtuality is assessed against each goal as ..."	"Our current level of capability in technology and virtual mindset is .... We need to perform the following actions to improve capabilities and then raise our virtuality indicators"
<b>Action</b>		
1. Confirm the virtualization vision	2. Take low scores and identify matching capabilities	3. Assess capabilities and initiate action plans to raise as required

work and the nature of the work distribution. A high virtual mindset would require a clear message and vision from management and the provision of appropriate communications and informational tools and processes, such that working in or out of the office can scarcely be differentiated. Table 4 demonstrates the method of arriving at action plans which will implement capabilities which most directly support the desired form of virtuality.

## CONCLUSION AND FUTURE TRENDS

We have presented a framework for recording a vision for virtualization and mapping progress toward it, as well as identifying and recording the capabilities needed to move from the current state of virtualization to a desired future state. The framework is both descriptive and analytical. It enables description of the organization at a point in time. It can be used to assess the extent of alignment between the envisioned form of virtualization, the current state of virtualization, and the capabilities of moving from current to envisioned state. Of course, the process of virtualization is dynamic; as the organizational state of virtualization changes, as its markets change, and as it changes in response to other internal and external changes, the vision of virtualization will change. The framework therefore provides

a tool for capturing vision, state and capabilities at a given point in time. Used to record these dimensions at a series of intervals, we propose that this framework can be used to map changes in an organization as its understanding of virtualization, its need for virtualization, its desired form of virtualization, and its actual form of virtualization evolve over time.

## REFERENCES

- Alavi, M., & Tiwana, A. (2002). Knowledge integration in virtual teams: The potential role of KMS. *Journal of the American Society for Information Science and Technology*, 53(12), 1029-1037.
- Bal, J., & Teo, P. (2000). Implementing virtual teamworking. Part 1: A best practice review. *Logistics Information Management*, 13(6), 346-352.
- Brown, J., & Duguid, P. (2000). *The social life of information*. Boston: Harvard Business School Press.
- Castells, M. (2001). *The Internet galaxy*. Oxford: Oxford University Press.
- Crandall, N., & Wallace, M. (1998). *Work and rewards in the virtual workplace*. New York: AMACOM.
- Drucker, P. (1999). *Management challenges for the 21<sup>st</sup> century*. Oxford: Butterworth-Heinemann.



Fritz, M., Narasimhan, S., & Rhee, H.-S. (1998). Communication and coordination in the Virtual Office. *Journal of Management Information Systems*, 14(4), 7-28.

Jackson, P., & Klobas, J. (2005). *Envisioning the virtual workplace: Conceptualising virtualisation*. Paper presented at the 13<sup>th</sup> European Conference on Information Systems: Information Systems in a Rapidly Changing Economy, Institute for Management of Information Systems. University of Regensburg, Germany.

Klobas, J., & Jackson, P. (Eds). (2007). *Becoming virtual: Knowledge management and transformation of the distributed organization* (p. 18). Heidelberg: Physica-Verlag.

Malhotra, A., Majchrzak, A., Carman, R., & Lott, V. (2001). Radical innovation without collocation: A case study at Boeing-Rocketdyne. *MIS Quarterly*, 25(2), 229-249.

Nemiro, J. (2000). The glue that binds creative virtual teams. In Y. Malhotra (Ed.), *Knowledge management and virtual organizations* (pp.101-123). Hershey, PA: Idea Group Publishing.

Pan, S., & Scarbrough, H. (1999). Knowledge management in practice: An exploratory case study. *Technology Analysis and Strategic Management*, 11(3), 359-374.

Pfeffer, J. (1990). Management as symbolic action: The creation and maintenance of organizational paradigms. In L. Cummings & B. Staw (Eds.), *Information and cognition in organizations* (pp.1-52). Greenwich, CT: JAI Press.

Senge, P. (Fall 1990). The leader's new work: Building learning organizations. *Sloan Management Review*, 32(1), 7-23.

Steel, G. (2003). *Virtual project management: The new frontier*. Retrieved from <http://www.indeco.co.uk/docs/Virtual%20Project%20Management%20march%202002.pdf>.

Venkatraman, N., & Henderson, J. (1998). Real strategies for virtual organizing. *Sloan Management Review*, 40(1), 33-48.

Warner, M., & Witzel, M. (2004). *Managing in virtual organizations*. London: Thomson Learning.

Yap, A., & Bjørn-Andersen, N. (2002). Capturing tacit mental models with 3D technologies: Enhancing knowledge-sharing in virtual organizations. *Electronic Journal of Organizational Virtualness*, 4(2). Retrieved from <http://www.virtualorganization.net/Projects/264/Issues/eJOV%20Vol4/Yap%20-%202002%20-%20eJOV4,2-1%20-%20Capturing%20Tacit%20Mental%20Models%20with%203D%20Technologies%20Enhancing%20Knowledge-sharing%20in%20Virtual%20Organizations.pdf>.

## KEY TERMS

**Capabilities for Virtualization:** The set of competencies and infrastructure available to support the process of virtualization.

**Virtual Work:** A form of work organization in which staff are routinely distributed across geographical locations and firm boundaries, supported by mobile information and communications technologies.

**Virtuality:** The qualitative and quantitative characteristics that define the nature and extent to which an organization is virtual.

**Virtuality Dashboard:** A visual representation of the extent to which an organization is virtual along several dimensions of virtuality.

**Virtualization:** The process of becoming a virtual organization.

**Virtualization Alignment:** Alignment between a firm's strategy for virtuality, current level of virtuality, and capability to operate virtually.

**Virtual Alignment Model (VAM):** A model of the elements of alignment accompanied by the likely effects of alignment or misalignment between a firm's strategy for virtuality, current level of virtuality, and capability to operate virtually at different levels.