THE STATUS OF VIRTUAL ORGANIZATIONS

Dumitru RĂDOIU

Abstract

More and more organizations, enterprises and entities are looking towards Virtual Organizations (VO) as a way to address critical issues. The paper reviews the status of VO research at two levels

- Technology (the platform, e.g. applications, components), enabling information to be created, distributed, consumed (e.g. interoperability, standardization, security, speed)
- VO design, or what is delivered over the platform (how we create, organize, distribute and consume information, how it supports the VO at operational level (procedures), tactical level (business processes) and strategic level (business value)

Keywords

Virtual organizations

More and more organizations, enterprises and entities are looking towards Virtual Organizations as a way to address critical issues like accessing others expertise in a global market, sharing skills and information within a network of independent entities which present themselves as a unified actor in a joint project, reducing costs, increasing flexibility, boosting innovation, accommodating increased demands from employees for a better quality of life.

There were many attempts to define a VO, one the most general ones being:

A Virtual Organization (VO) comprises of a set of independent organizations/entities which share resources to achieve a common mission /goal. It does not have a central geographical location and VO members interact mainly through computer networks.

1. About the approach

"…the success of a virtual corporation [organization] will depend on its ability to gather and integrate a massive flow of information throughout its organizational components"[8]

VOs are based on sharing resources crossing distances and time zones in order to solve a problem, reach a goal like:

- getting closer to new markets and customers
- gathering together rare expertise
- no other option

Resources are either knowledge (information) or are other resources shared via information exchange (e.g. human resources; the platform enables individuals to collaborate)

BDD-A23791 © 2007 Editura Universităţii „Petru Maior"
Provided by Diacronia.ro for IP 216.73.217.42 (2026-11-15 20:02:08 UTC)

Information like everything else is created, distributed and consumed.
Technology (in this case collaboration technology and supporting infrastructure) is only the platform over which information is distributed.

Regarding VO there're two levels of discussion:

- **Enabling technology** (the platform, e.g. applications, components), enabling information to be created, distributed, consumed (e.g. interoperability, standardization, security, speed)
- **VO design**, or what is delivered over the platform (how we create, organize, distribute and consume information, how it supports the VO at **operational level** (procedures), **tactical level** (business processes) and **strategic level** (business value)

Supporting Technology issues:

- Infrastructure interoperability/ standardization
- Security, business continuity, disaster recovery
- Trends

VO design and operational issues:

- VO Research status
- VO Theory and reference models
- VO partners identification and trust
- VO partners interoperability
- VO design
- VO management
- VO Knowledge management

Observation:

a. Virtual companies represent a megatrend [9]. According to Gartner the drivers and inhibitors for this trend are:
    - Drivers for VOs: business impact, maturing technology and standards (EDI, XML, GDS, CPFR, SOA, Web services, portals), improved integration (integration as a service), multi-enterprise success (Dell, Seagate, Wal-mart)
    - Inhibitors for VOs: Security (Legal, IP protection, authentication), culture and trust (resistance to change, hidden agendas), technical compatibility (incomplete B2B standards), partner un-readiness (un-balanced risks/rewards, unwilling to invest time and resources in collaboration)

b. Gartner experts see VOs NOT as a technology but as a strategy [10] involving:
    - Communities of interest (shared business objectives)
    - Communities of trust (joint authentication, integrity, privacy)
    - Shared infrastructure (including a B2B gateway)

BDD-A23791 © 2007 Editura Universităţii „Petru Maior"
Provided by Diacronia.ro for IP 216.73.217.42 (2026-11-15 20:02:08 UTC)

2. VO baseline

The two most important elements for a roadmap are the state of the art (baseline) and the vision of VO future.
The baseline for virtual organizations in Europe can be summarized as follows:

VO Supporting Technology Base Line:

- Infrastructure interoperability/ standardization of collaborative networks
  - The main focus has been on ICT infrastructure and therefore basic supporting infrastructures and relevant technologies are well represented, but the developments are often focused on particular needs and based on ad-hoc experiments, hardly re-utilizable [2]
  - Efforts on general plug-and-play architecture and interoperability are to a large extent missing [2]
  - no generally accepted interoperability base is available
- Services
  - No complex services that can be combined in multiple ways to offer better flexibility, agility and efficiency for VOs business environment
- Security, business continuity, disaster recovery
  - No systematic approach

VO Design and Operation Base Line:

- VO Research status
  - Research on VO has created a critical mass and European-wide intuitive understanding of the area [2]
  - Generic functions or harmonization of achievements are addressed only in a few projects [2]
  - plausible future scenarios for collaborative network organizations and professional virtual communities are being discussed [3][4]
- VO Theory and reference models
  - No reference model is available
- VO partners identification and trust
  - Lack of organized environment and support services
- VO partners interoperability
- VO design and organization
  - Little research is focused on organizational issues
- VO management
  - VO management is mainly focused on best practices
- VO Knowledge management
- VO generated social issues
  - Little research is focused on the social issues created by VOs

BDD-A23791 © 2007 Editura Universităţii „Petru Maior”
Provided by Diacronia.ro for IP 216.73.217.42 (2026-11-15 20:02:08 UTC)

3. VO Vision

"In 2015 most enterprises will be part of some sustainable collaborative networks that will act as breeding environments for the formation of dynamic virtual organizations in response to fast changing market conditions." [7]
"The VO research area is recognized as a scientific discipline" [2]

VO Supporting Technology Vision:

- Infrastructure interoperability/ standardization of collaborative networks
  - Technology-independent reference architecture for the horizontal infrastructure
  - Generic infrastructure and re-utilizable service toolbox, based on interoperability standardization
  - Plug-and-play concept extended to inter-organizational services
  - Support for federated information and resources management
  - "Configure yourself" philosophy (user "programmable" infrastructure)
- IT services to support business in VOs
  - "IT support services will … assist VO brokers, management and employees …[in] setting-up, operating and dissolving VOs. The tools are embedded in flexible architectures suited for different types of virtual organizations; driven by business, social, legal, etc. needs and are easy to use and provide a well balanced approach between human support and business process automation."[2]
- Security, business continuity, disaster recovery
  - Full e-transaction security and privacy is guaranteed

VO Design and Operation Vision:

- Market
  - Turbulent markets [6]
  - Sustainable VOs
- VO Theory and reference models
  - Well founded models of collaboration
  - Models address all aspects regarding the design and functioning of VOs (e.g. configuration, roles and responsibilities, coordination, distributed process management, general agreements, co-operation contract)
- VO partners identification and trust
  - **Breeding environments** replicable to a large variety of sectors
  - Wide understanding of brokerage and pro-active approach to VO formation
- VO partners interoperability
  - Comprehensive and transparent legal framework for collaboration
- VO design
  - Well-defined business models

BDD-A23791 © 2007 Editura Universităţii „Petru Maior"
Provided by Diacronia.ro for IP 216.73.217.42 (2026-11-15 20:02:08 UTC)

- VO management
    - Management principles adopted with regard to planning, control, organization and leadership in VOs
    - Defined organization principles for seamless flow of responsibility, ownership, knowledge and benefits along the VO life cycle and across VO boundaries, in relation to customers, other networks and third parties
    - Decision-making in all phases of the VO life cycle is based on well argued and verified models and methodologies
- VO socio-economic issues
    - socio-economic environment will be fully developed to support virtual organizations
    - Social responsibility based on a suitable ethical code
    - People being prepared and supported to work as employees or professionals in virtual organization settings
- VO legal issues
    - Comprehensive (international) legal frameworks for VOs

4. Relevant Case Studies

A. Virtual communities of professionals: The U.K. Department of Trade and Industry has built virtual communities to stimulate innovation among researchers and vendors. The project reveals some of the best practices for building active communities quickly.
B. Case Studies of Successful Virtual Organizations [11]

References

[1] Methods in science roadmapping: How to plan research priorities, David R. MacKenzie, Sam Donald, Mike Harrington, Robert Heil, T. J. Helms and Daryl Lund, University of Maryland,www.escop.msstate.edu/archive/roadmap-methods.doc

[2] Luis M. Camarinha-Matos, Hamideh Afsarmanesh, A Roadmap for Strategic Research on Virtual Organizations, in "Processes and foundations for virtual organizations", (L.M. Camarinha-Matos, H. Afsarmanesh, Editors), Kluwer Academic Publishers, ISBN 1-4020-7638-X, Oct 2003

[3] www.thinkcreative.org

[4] www.ce-net.org

[5] Hamideh Afsarmanesh, Luis M. Camarinha-Matos, A Framework for Management of Virtual Organization Breeding Environments, in "Collaborative Networks and their Breeding Environments", (PRO-VE'05), Springer, Valencia, Spain, 26-28 Sep 2005

[6] Camarinha-Matos, L.M.; Afsarmanesh, H.; Ollus, M. (Ed.s) – Virtual Organizations: Systems and Practices, Springer, 2005

BDD-A23791 © 2007 Editura Universităţii „Petru Maior"
Provided by Diacronia.ro for IP 216.73.217.42 (2026-11-15 20:02:08 UTC)

[7] THINKcreative Interim Green Report on New Collaborative forms and their needs, L.M. Camarinha-Matos, H. Afsarmanesh (Ed.s), THINKcreative report Sep 2002

[8] Davidow, W. & Malone, M. (1992) "The Virtual Corporation" Harper Business,

New York

[9] The Gartner Scenario: Current Trends and Future Direction of the IT Industry, April 22-26, 2007, San Francisco, CA

[10] Multi-Enterprise Integration: Challenging Systems, Collaboration and Trust, Gartner Symposium/ITxpo October 8-13, 2006, Orlando, FL

[11] http://www.virtual-organization.net/apps/pub.asp?Q=991&T=Book%20of%20Knowledge

BDD-A23791 © 2007 Editura Universităţii „Petru Maior"
Provided by Diacronia.ro for IP 216.73.217.42 (2026-11-15 20:02:08 UTC)