EXPLORING COLLABORATIVE NETWORKED ORGANISATIONS IN ECOLEAD

Mitja Jermol
based on Luis M. Camarinha-Matos
OUTLINE OF THE TALK

• Aim – Philosophy
• Context
• Why ECOLEAD?
  – Aim
  – Goal
  – Key results
  – Structure, partnership,
• Progress and results
• Critical assessment
In ten years, in response to fast changing market conditions, most enterprises and specially SMEs will be part of some sustainable collaborative networks that will act as breeding environments for the formation of dynamic virtual organisations.

ECOLEAD aims at creating the necessary strong foundations and mechanisms for establishing the most advanced collaborative and network-based industry society in Europe.

European Collaborative networked Organisations Leadership Initiative
A holistic approach combining:

- Breeding environments
- Management of (dynamic) VOs
- Professional Virtual Communities
- Horizontal Infrastructures for collaboration
- Theoretical foundation

Towards the establishment of collaborative networks as a new scientific discipline
HOLISTIC APPROACH

Concepts, Models, Frameworks, Architectures

Organisation structures, Processes, Methodologies, Rules, Guidelines

Theoretical foundations, Scientific discipline

ICT Tools, Solutions, ICT Infrastructure,

Roadmapping, Dissemination

Pilots, Case studies,
NOTION OF COLLABORATION

- Joint goals: Joint identities, Working together (Creating together), Joint responsibility
- Compatible goals: Individual entities working apart (with some coordination)
- Complementary goals: (aligning activities for mutual benefit)

Integration level

- Network
- Coordinated work
- Cooperative work
- Collaborative work

Coalition’s type
COLLABORATION

• Network intelligence
  – from Egoism to Altruism
  – from Self to Group
  – from Taking to Sharing

IQ → EQ → NQ (CQ)
individual, cognitive complex reasoning → Self awareness & empathy → connecting, integrating & sharing

Is the society ready for collaboration?
FOCUSING

Business opportunity (Collaboration opportunity)

Market turbulence

Short window of opportunity

Networked organisation

Fast configuration of a temporary consortium well suited to the market needs

Successful & Effective collaboration

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FROM CO TO SUCCESSFUL COLLABORATION

1. CO identification
   - Who?
   - Where and How?
   - Which brokerage policy?
   - What is of interest?

2. CO characterisation & VO/VT rough planning
   - Who?
   - Which partners?
   - How to structure VO/VT?
   - Any initial template model?

3. Partners search & selection
   - Who?
   - Where?
   - Which criteria?
   - Profiles?
   - Decision support?

4. Negotiations & agreements
   - Who?
   - Negotiation process?
   - Contracts, rules, templates?
   - Agreements?

Actors and roles
Models
Rules and principles
Reference models
Support functionalities
Support information
…
FROM CO TO SUCCESSFUL COLLABORATION II

VO/VT creation

- CO identification
- CO characterisation & VO/VT rough planning
- Partners search & selection
- Negotiations & agreements

VO/VT launching

Common infrastructure?
Governance principles?
Detailed planning?

VO/VT operation

- Who?
- Management approach?
- Monitoring/Supervision/
  Coordination?
- Performance management?

VO/VT dissolution

- Responsibilities & liabilities?
- Inheritance?
- Lessons learned?
- Performance summary?

VO/VT evolution

- Who?
- Where?
- Which criteria?
- Negotiation support?
ECOLEAD FOCUS AREAS II

- **VBE**
  - Intended to increase the level of *preparedness* of organizations to participate in (dynamic) Vos

- **VOM**
  - Support (dynamic) VOs through their *life cycle*

- **PVC**
  - Putting the focus on *human collaboration* and corresponding value creation

- **TF**
  - The theoretical foundation shall provide the *basis for* technology-independent *understanding* of the area and its phenomena.

- **ICT-I**
  - The existence of an invisible, low-cost ICT infrastructure is a pre-condition for the establishment of truly dynamic collaborative networks.

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INDUSTRY CONCEPTS
CONTEXT

Common references & goals

Collaborative Networks level?

Products & Services

Shop floor level

Intra-enterprise level

Inter-enterprise level

Cell Level

70’ 80’ 90’ 00’

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HISTORIC CONTEXT

Integration Level

Inters Enterprise

Intra Enterprise

Cell & Shop-Floor

70's 80's 90's

CIM

Balanced Automation

ERP

MES

Virtual Organization

Virtual Enterprise

Extended Enterprise

Collaborative Networks

NEW DISCIPLINES

Enterprise Engineering

Manufacturing / Industrial Automation

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RESEARCH CONTEXT

Business ecosystem
E-Business
Breeding environment
Virtual lab
Virtual enterprise
Virtual organization
Virtual team
Virtual community
Extended enterprise
Virtual lab
Virtual enterprise
Virtual community
Community of practice
Supply chain

Collaborative networked organization

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# A Large “History” of VE/VO Projects

**VE (Past)**
- ESPRIT
- IST
- INCO
- ALFA
- IMS
- NIIIP
- National programs
- National programs

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<th>Virtual Organizations</th>
<th>Accompanying Measures</th>
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<td>OBELIX</td>
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<td>DISRUPT IT</td>
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<td>PLEXUS</td>
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<td>… &amp; more</td>
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<td>GLOBEMEN</td>
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<td>TeleCARE</td>
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... & more
Widening scope ... Multiplication of tools
SOCIAL CONTEXT

What do you mean by VO?

Can I establish my VO in 1 day?

Which tools do I need?

Where can I buy them?

How shall I behave in a CNO?

What do I benefit from it?

How do I measure it?

So, is this simply a management issue?

What about my “life maintenance”?

And... ? ... And ... ?

PVC

VO

Extended Enterprise

Business Ecosystem

SCM

VE

?
WHAT WE UNDERSTAND BY CNO?

Collaborative Networks (CN)

Collaborative Networked Organizations (CNO)

Virtual Laboratory (VL)

Virtual Organization (VO)

Virtual Enterprise (VE)

Extended Enterprise

Professional Virtual Community (PVC)

CNO Breeding Environment
WHAT WE UNDERSTAND BY CNO?

Network ...

Constituted by a variety of entities (e.g. organizations and people) that are:
- largely autonomous
- geographically distributed
- heterogeneous in terms of their: operating environment, culture, social capital and goals

Nevertheless these entities collaborate to better achieve common or compatible goals

The collaborative interactions are supported by a computer network.

Unlike other networks, in CNO collaboration is an intentional property that derives from the shared belief that together the network members can achieve goals that would not be possible or would have a higher cost if attempted by them individually.
The operating principles of VO breeding environments are understood and formalized, the framework and services to support the full life cycle of the collaborative networks are developed in a generic way but coping with different specificities and SME needs.

Results:
VBE reference framework
- Entities, structure, roles, behavior
Competencies management
Ontology evolution
Trust management support
VO creation framework
VBE management tools

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Well-defined **business models** and **tools** for systematic **VO management** (planning, control, organization and leadership), taking into account the **social mechanisms** in multi-interest collaboration networks, as well as the **transitional nature** of VO.

**Results:**

**Dimensions:**
1) Behavior / processes
2) Resources / assets
3) Dynamics

Structure, actors, roles
Network-centric models

Performance indicators & supervision
Value systems
Business models
Support tools
The human centered management and exploitation of knowledge and value creation are leveraged by well-supported Professional Virtual Communities (PVC), which are synergistically integrated in the business ecosystem.

Results:
- Organizational forms
- Behavior, roles, rules
- Skills & competencies
- Support institutions
- Value systems
- Benefits, performance, ...
- Business models
- Collaboration platform & tools
The ICT infrastructure will be developed as an open, transparent, easy to use, and affordable enabler of collaborative behaviors in networked organizations.

Intermediate support for collaboration
Technology “independence” and prototyping
Require specific business models
Understand and model the principles of collaboration, emerging behavior and self-organization in **collaborative networks**

Modeling foundation

Reference models of CNOs

**New scientific discipline: Collaborative Networks**

A discipline of **collaborative networks** shall focus on the structure, behavior, and evolving dynamics of networks of autonomous entities that collaborate to better achieve common or compatible goals
Pilot validation of models and tools in front-runner collaborative networks of SMEs

Achieve a robust framework for the successful take up and exploitation of project results

Multipliers base & collaboration synergies

Publications in high quality channels
TRAINING

- Creation of a Virtual Learning Community for knowledge sharing
- Reference curricula for CNO
- High quality training content
- Training events – traditional, ICT based, combined
VIRTUAL LEARNING COMMUNITY

http://seminars.ijs.si/ecolead/
http://seminars.ijs.si/etpublic/
http://seminars.ijs.si/etmultipliers/
http://seminars.ijs.si/ecolead/newcommers/
http://videolectures.net/ecolead/
STRAATEGIC & KEY RESULTS

- VO Breeding Environment Organization Framework
- VO Creation Framework
- VO Operation & Management Models and Services
- PVC Business Model
- PVC Collaboration Platform
- Business Model for Collaboration Infrastructures
- Plug and Play Collaboration Infrastructure
- Theoretical Foundation for CNOs
- Training program on CNOs
- VBE reference framework
- Dynamic VO management models
- PVC reference framework
- Reference architecture for collaborative infrastructures
- Reference architecture for collaboration e-services
- Plug & Play infrastructure for collaboration
- Dynamic multi-level security mechanisms
- VBE management services
- Dynamic VO creation assistance tool
- Contract negotiation wizard
- VO performance measurement tool
- Collaborative distributed business process supervision tool
- VO management e-services
- Advanced collaboration platform for PVCs
- Collaborative problem solving support e-services

FORMAL and semi-formal modeling foundation for CNOs
- Reference models for CNOs
- Models interoperability basis
- Soft modeling foundation
- Lively update of ECOLEAD strategic and results roadmaps
- Long-term strategic roadmap for CNOs
- Model of impact creation process & methodology for results assessment
- Pilot validation models and tools in front-runner CN of SMEs
- Impact creation plan and mechanisms
- Established links with impact multipliers base
- Specific actions in collaboration with impact multipliers

THEORETICAL foundation for CNOs

ROOSTMAPPING for strategic research

VALIDATION and Industrial impacts

Training & education

Dissemination

- Virtual Learning Community
- European training program on CNO
- Training workshops and summer schools
- Distance learning materials on CNO
- Publications in conferences
- Publications in journals

ECOLEAD strategic results
Integrated framework for establishment and operation of CNOs

Facilitation of CNOs growth

Increase knowledge & implantation of CNOs

Requirements

Validation feedback

Governments Policy & decision makers
ECOLEAD IMPACTS

Science
- Theoretical foundation
- New models of business ecosystems
- New models of synergy among BE, VO, and PVC
- New frameworks for collaborative PVC
- New concepts, principles and reference architectures for horizontal infrastructures
- Guidance for new institutions to support collaboration
- Better education on modeling & formalisms
- New metrics of self-organizing collaborative networks
- Recognition as discipline
- New metrics and value systems
- New frameworks for collaborative PVC
- Increased sustainable regional business ecosystems
- Better structured approaches for collaborative communities

Industry
- Sound Decision-making and assessment
- New metrics & value systems
- Improved competitiveness
- Improved performance & involvement of SMEs in collaborative networks
- New knowledge skills and aptitudes regarding competence management
- Basis for advanced tools
- New technology development opportunities
- Basis for plug-and-do-business
- Basis for new collaborative applications

Society
- Wider collaboration among organizations
- Greater availability of "connectivity" potential
- Better support from industry associations to VO
- Generic models for VO operation & assessment
- New ways of work
- Sound framework for knowledge workers / e-lancers
- Basis for business exploitation of PVCs
- Support networks of SMEs

ECOLEAD Impacts
• ECOLEAD - European Collaborative Organisations LEADership Initiative
• Proposal Number: IP 506958
• Number of partners: 27
• Duration: 4 years
• Total costs: 14 Mio (10 Mio)
• Work load: 1262 person months
CONSORTIUM

- VTT Technical Research Center – (Coordinator) - FIN
- UNINOVA – Institute for the development of new technologies – P
- UvA – University of Amsterdam – NL
- BIBA – Bremen Institute of Industrial Technology and Applied Work Science
- UFSC - Universidade Federal de Santa Catarina – BR
- JSI - Jozef Stefan Institute - SI
- CTU - Czech Technical University in Prague - CZ
- ITESM – Instituto Technologico y de Estudios Superiores de Monterrey – MEX

- Software AG – E
- France Telecom – F
- Gruppo Formula – (Enterprise Application Solution Providers) - I
- TXT – eSolutions – (SW and system integration vendor) SCM, CRM - I
- Siemens – Siemens Program and System Engineering (PSE) – DE
- Logica CMG – IT Consultant - NL

- TeS – I
- ENCIMA – SCM developer – DE
- CERTICON - CertiCon a.s. –SW developer - CZ
- ComArch – Software developer – PL

- Virtuelle Fabrik – association of 100 companies in CH, DE, A, FL
- AIESEC – International Student Organisation
- ISOIN – case study – E
- CeBeNetwork – case study – DE
- Swiss Microtech – case study – CH
- SNS – case study – IE
- ORONA – case study – E
- Joensuu Science Park – case study – FI
- EDINFORM – case study - I

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CONCLUSIONS

- Collaborative networked organizations is a strong socio-economic “movement”
- ECOLEAD is based on a strategic vision towards leadership in collaborative networks
- ECOLEAD relies on a multi-disciplinary consortium and effective coordination team

- ECOLEAD Info resources:
  - http://www.ecolead.org
  - http://seminars.ijs.si/ecolead