NETWORK-CENTRIC COLLABORATION AND SUPPORTING FRAMEWORKS

IFIP - The International Federation for Information Processing

IFIP was founded in 1960 under the auspices of UNESCO, following the First World Computer Congress held in Paris the previous year. An umbrella organization for societies working in information processing, IFIP's aim is two-fold: to support information processing within its member countries and to encourage technology transfer to developing nations. As its mission statement clearly states,

IFIP's mission is to be the leading, truly international, apolitical organization which encourages and assists in the development, exploitation and application of information technology for the benefit of all people.

IFIP is a non-profitmaking organization, run almost solely by 2500 volunteers. It operates through a number of technical committees, which organize events and publications. IFIP's events range from an international congress to local seminars, but the most important are:

- The IFIP World Computer Congress, held every second year;
- · Open conferences;
- Working conferences.

The flagship event is the IFIP World Computer Congress, at which both invited and contributed papers are presented. Contributed papers are rigorously refereed and the rejection rate is high.

As with the Congress, participation in the open conferences is open to all and papers may be invited or submitted. Again, submitted papers are stringently refereed.

The working conferences are structured differently. They are usually run by a working group and attendance is small and by invitation only. Their purpose is to create an atmosphere conducive to innovation and development. Refereeing is less rigorous and papers are subjected to extensive group discussion.

Publications arising from IFIP events vary. The papers presented at the IFIP World Computer Congress and at open conferences are published as conference proceedings, while the results of the working conferences are often published as collections of selected and edited papers.

Any national society whose primary activity is in information may apply to become a full member of IFIP, although full membership is restricted to one society per country. Full members are entitled to vote at the annual General Assembly, National societies preferring a less committed involvement may apply for associate or corresponding membership. Associate members enjoy the same benefits as full members, but without voting rights. Corresponding members are not represented in IFIP bodies. Affiliated membership is open to non-national societies, and individual and honorary membership schemes are also offered.

NETWORK-CENTRIC COLLABORATION AND SUPPORTING FRAMEWORKS

IFIP TC5 WG 5.5 Seventh IFIP Working Conference on Virtual Enterprises, 25-27 September 2006, Helsinki, Finland

Edited by

Luis M. Camarinha-Matos New University of Lisbon, Portugal

Hamideh Afsarmanesh University of Amsterdam, The Netherlands

Martin Ollus VTT Industrial Systems, Finland



Library of Congress Control Number: 2006931349

Network-Centric Collaboration and Supporting Frameworks

Edited by L. M. Camarinha-Matos, H. Afsarmanesh and M. Ollus

p. cm. (IFIP International Federation for Information Processing, a Springer Series in Computer Science)

ISSN: 1571-5736 / 1861-2288 (Internet)

ISBN: 10: 0-387-38266-6

ISBN: 13: 9780-387-38266-6

eISBN: 10: 0-387-38269-0 Printed on acid-free paper

Copyright © 2006 by International Federation for Information Processing.

All rights reserved. This work may not be translated or copied in whole or in part without the written permission of the publisher (Springer Science+Business Media, LLC, 233 Spring Street, New York, NY 10013, USA), except for brief excerpts in connection with reviews or scholarly analysis. Use in connection with any form of information storage and retrieval, electronic adaptation, computer software,

or by similar or dissimilar methodology now known or hereafter developed is forbidden.

The use in this publication of trade names, trademarks, service marks and similar terms, even if they are not identified as such, is not to be taken as an expression of opinion as to whether or not they are subject to proprietary rights.

9 8 7 6 5 4 3 2 1 springer.com

TABLE OF CONTENTS

CO-SPONSORS		xi xii xiii
PART 1. MODELING FRAMEWORKS		
1	MODELING FRAMEWORK FOR COLLABORATIVE NETWORKED ORGANIZATIONS	
2	L. M. Camarinha-Matos, H. Afsarmanesh	3
3	D. Ivanov, J. Kaeschel, B. Sokolov, A. Arkhipov	15
	M. Roque, B. Vallespir, G. Doumeingts	23
PA	RT 2. COLLABORATIVE NETWORKS MODELS	31
4	SELF-ORGANIZING VIRTUAL ENTERPRISES	2.2
5	H. T. Goranson A CONTRIBUTION TO A PRODUCTION NETWORK (PN) THEORY	33
6	H. Kuehnle TOWARDS A TAXONOMY FOR NETWORKING MODELS FOR INNOVATION	45
	M. Flores	55
PA	RT 3. NETWORKING AND INNOVATION	67
7	TOWARDS A CULTURE OF SHARING AND EXCHANGE: INVESTING IN THE INTANGIBLE ASSETS AND INTELLECTUAL CAPITAL FOR THE LEVERAGING OF COLLABORATIVE NETWORKS	
8	B. Roberts, A. Koumpis	69
9	P. Campos, P. Brazdil, P. Brito	77
10	R. C. Beckett	85
	V. Serrano, T. Fischer	93
PA	RT 4. VALUE SYSTEMS	101
11	TOWARDS THE DEFINITION OF BUSINESS MODELS AND GOVERNANCE RULES FOR VIRTUAL BREEDING ENVIRONMENTS D. Romero, N. Galeano, J. Giraldo, A. Molina	103

12	NETWORKS ENVIRONMENTS P. Macedo, C. Sapateiro, J. Filipe
13	A NEW MODEL FOR ACHIEVING VALUE ADDED GOALS IN A COLLABORATIVE INDUSTRIAL SCENARIO G. Confessore, G. Liotta, S. Rismondo
	RT 5. COMPETENCY MANAGEMENT
14	COMPETENCY AND PROFILING MANAGEMENT IN VIRTUAL ORGANIZATION BREEDING ENVIRONMENTS E. Ermilova, H. Afsarmanesh
15	COMPETENCE PROFILING IN VIRTUAL COMPANIES B. Odenthal, M. Peters
16	COLLABORATIVE PLANNING IN COMPETENCE-CELL BASED NETWORKS
	E. Müller, J. Ackermann, S. Horbach
PA	RT 6. TRUST BUILDING
17	ASSESSMENT AND CREATION OF TRUST IN VBEs S. S. Msanjila, H. Afsarmanesh
18	TRUST BUILDING FOR ENHANCING COLLABORATION IN VIRTUAL ORGANIZATIONS
19	I. Mezgár IT IS NOT ALL ABOUT TRUST – THE ROLE OF DISTRUST IN INTER-ORGANIZATIONAL RELATIONSHIPS R. Seppänen, K. Blomqvist
_	
PA	RT 7. TRUST AND RISK
20	COORDINATING SUPPLIER RELATIONS: THE ROLE OF INTERORGANIZATIONAL TRUST AND INTERDEPENDENCE
21	T. Laaksonen, H. I. Kulmala
22	P. Urze STABILITY ANALYSIS IN THE FRAMEWORK OF DECISION MAKING UNDER RISK AND UNCERTAINTY
	D. Ivanov, A. Arkhipov, V. Tolkacheva, B. Sokolov
PA	RT 8. PROCESS MANAGEMENT
23	DISSECTING INTER-ORGANIZATIONAL BUSINESS PROCESS MODELING: A LINGUISTIC AND CONCEPTUAL APPROACH
	C. T. Martins, A. Lucas Soares
24	DYNAMIC PROCESS ORGANISATION S. Chaari, F. Binnier, J. Favrel, C. Ben Amar
25	A COLLABORATIVE MODEL FOR LOGISTICS PROCESS MANAGEMENT
26	G. Confessore, G. Galiano, G. Stecca DISTRIBUTED MODEL MANAGEMENT FOR COLLABORATIVE NETWORKS IN AEC
	K. Menzel, M. Keller

Pa	RT 9. PERFORMANCE AND NETWORK MANAGEMENT	253
27	ENHANCEMENTS IN PERFORMANCE THROUGH VIRTUAL COLLABORATION AMONG SMEs	
28	J. B. Hauge, A. Imtiaz, M. Auerbach, J. Eschenbächer, M. Seifert	255
29	P. Gloor, M. Paasivaara, D. Schoder, P. Willems	265
ر ــــ	COLLABORATIVE ENVIRONMENTS A. Abreu, L.M. Camarinha-Matos	273
30	KNOWLEDGE MANAGEMENT BASED APPROACH FOR VIRTUAL ORGANIZATION INHERITANCE	2,0
	L. Loss, A. A. Pereira-Klen, R. J. Rabelo	285
PA	RT 10. DECISION MAKING	295
31	DECISIONAL INTEROPERABILITY: CONCEPTS AND FORMALISATION	
32	N. Daclin, D. Chen, B. Vallespir	297
33	R. Kracke, J. B.Hauge, H. Duin, KD. Thoben	305 313
PA	RT 11. PLATFORMS FOR PROFESSIONAL VIRTUAL COMMUNITIES	321
34	AREITO: A DEVELOPMENT PLATFORM FOR VIRTUAL LEARNING COMMUNITIES	
	C. Garita, U. Agüero, L. Guadamuz,	323
35	NETWORK OASIS: NEW PRACTICES FOR EMERGENT	
	COLLABORATIVE WORKING ENVIRONMENTS	
36	I. Kakko, M. Lavikainen, T. Glotova A PROCESS MODEL FOR COLLABORATIVE PROBLEM SOLVING IN VIRTUAL COMMUNITIES OF PRACTICE	333
	M. C. Casalini, T. Janowski, E. Estevez	343
PA	RT 12. FRAMEWORKS FOR PVC	351
37	ADAPTIVE COLLABORATION IN PROFESSIONAL VIRTUAL COMMUNITIES VIA NEGOTIATIONS OF SOCIAL PROTOCOLS	
38	W. PicardTHE SOCIO-TECHNICAL DESIGN OF A SME KNOWLEDGE COMMUNITY IN THE CONSTRUCTION INDUSTRY	353
39	D. Simões, A. Lucas Soares	361
	PROFESSIONAL VIRTUAL COMMUNITIES FORMALIZATION S. Crave, T. Bouron, S. Ladame	371

PA	PART 13. VO CREATION	
	OPERATIONAL DESIGN IN VO SUPPLY NETWORKS CREATION C. Heavey, P.J. Byrne, P. Liston, J. Byrne	381
41	PARTNER SELECTION WITH NETWORK INTERDEPENDENCIES: AN APPLICATION	200
42	T. Jarimo, I. Salkari, S. Bollhalter	389
43	A. P. Volpentesta, M. Muzzupappa SOURCE NETWORKS FOR FORMATION OF VIRTUAL ENTERPRISES ACTIVE IN ELECTRONIC SYSTEMS DESIGN	397
	M. Witczynski	407
PA	RT 14. NEGOTIATION AND CONTRACTING	417
44	A CASE STUDY ON ELECTRONIC CONTRACTING IN ON-LINE ADVERTISING – STATUS AND PROSPECTS	
45	S. Angelov, P. Grefen	419
46	B. Krawczyk-Brylka, M. Piotrowski	429
	ENTERPRISE WITH MULTIAGENT SYSTEMS T. Kaihara, S. Fujii	439
PART 15. ICT PLATFORMS FOR COLLABORATION		449
47	THE ECOLEAD ICT INFRASTRUCTURE FOR COLLABORATIVE NETWORKED ORGANIZATIONS	
48	R. J. Rabelo, S. Gusmeroli, C. Arana, T. Nagellen	451
49	J. P.T. Mo, R. C. Beckett, L. Nemes, S. Woodman	461
50	R. Tagg	471
	T. Ruokolainen, L. Kutvonen	481
PA	RT 16. DISTRIBUTED INFORMATION SYSTEMS	489
51	DISTRIBUTED INFORMATION SERVICES SUPPORTING COLLABORATIVE NETWORK MANAGEMENT	
52	W. Mulder, G. R. Meijer	491 499
53	DISTRIBUTED MODEL MANAGEMENT PLATFORM FOR VIRTUAL ENTERPRISE NETWORKS D. Vanderhaeghen, P. Loos	507
	D. rumermegnen, 1. 1000	307

54	INTEROPERABILITY IN COLLABORATIVE NETWORK OF BIODIVERSITY ORGANIZATIONS O. Unal, H. Afsarmanesh	
Pa	RT 17. SERVICE ORIENTED APPROACHES	
55	SERVICE DEVELOPMENT IN VIRTUAL ENTERPRISES	
56	G. Schuh, H. Dirlenbach, L. Georgi	
57	A. Svirskas, I. Ignatiadis, B. Roberts, M. Wilson	
PA	RT 18. ICT COMPONENTS	
58	SINGLE SIGN-ON AND AUTHORIZATION FOR DYNAMIC VIRTUAL ORGANIZATIONS	
59	R.O. Sinnott, O. Ajayi, A.J. Stell, J. Watt, J. Jiang, J. Koetsier	
60	J. Holmström, K. Främling	
	O. Oteniya, T. Janowski, A. Ojo	
PA	RT 19. COLLABORATIVE NETWORKS IN INDUSTRY	
61	PAST, PRESENT AND FUTURE OF THE ANDALUSIAN AERONAUTICAL CLUSTER	
62	C. M. Aguilera, A. Castañeda, F. Guerrero	
63	S. Thiebus, U. Berger	
64	R. Vargas Vallejos, C. Lima, G. Varvakis	
РΔ	RT 20. COLLABORATIVE NETWORKS IN SERVICES	
65	THE NON-ACCIDENTAL TOURIST: USING AMBIENT INTELLIGENCE FOR ENHANCING TOURIST EXPERIENCES	
66	S. A. Petersen, A. Kofod-Petersen	
	D. Hertweck, D. Bouché	

ΑŪ	JTHOR INDEX	651
	B.R.M. Manning, M.M. Stosuy	643
	CHALLENGE	
68	e-HEALTH AND CARE SERVICE INTEGRATION: THE DEMOGRAPHIC	
	J. Silva, A. Abrantes, A. L. Osório, B. Basílio, J. Sales Gomes	635
	ENFORCEMENT WITH ITSIbus ALPR	
67	A COLLABORATIVE LEGAL FRAMEWORK FOR CERTIFIED	

TECHNICAL SPONSORS:



IFIP WG 5.5 COVE

Co-Operation infrastructure for Virtual Enterprises and electronic business



ECOLEAD

European Collaborative Networked Organizations Leadership Initiative

IST IP 506958 project



Society of Collaborative Networks

ORGANIZATIONAL CO-SPONSORS











PRO-VE'06 – 7th IFIP Working Conference on VIRTUAL ENTERPRISES

Helsinki, Finland, 25-27 September 2006

Program Chair - Prof. Luis M. Camarinha-Matos (PT)

Program track co-chairs:

- CNO coordination and management Dr. Alexandra Klen (BR)
- ICT Infrastructures & interoperability Rama Akkiraju (US), Prof. Ricardo Rabelo (BR)
- · Modeling, ontologies and theoretical issues Prof. Tomasz Janowski (MO)
- Value systems and business perspectives -Prof. Dimitris Assimakopoulos (FR)
- Virtual Communities and Social Networks Hans Schaffers (NL)
- Virtual Organizations Breeding Environments Dr. Hamideh Afsarmanesh (NL)

Organization Chair - Chief research scientist Martin Ollus (FI)

Associated events chairs:

- Panel organization Sergio Gusmeroli (IT)
- Session on SME networks case studies Iris Karvonen (FI)
- Birds of a feather session Wico Mulder (NL), Sobah Abbas Petersen (NO)

REFEREES FROM THE PROGRAMME COMMITTEE

Chima Adiele (CA) Hamideh Afsarmanesh (NL) Rama Akkiraju (US) Dimitris Assimakopoulos (FR) Américo Azevedo (PT) Eoin Banahan (UK) José Barata (PT) Peter Bernus (AU) Peter Bertok (AU) Kirsimarja Blomqvist (FI) Luis M. Camarinha-Matos (PT) Wojciech Cellary (PL) Heiko Dirlenbach (DE) Eero Eloranta (FI) Jens Eschenbaecher (DE) Elsa Estevez (AR) João Pinto Ferreira (PT) Joaquim Filipe (PT) Myrna Flores (CH) Cesar Garita (CR) Ted Goranson (US) Fernando Guerrero (ES) Angappa Gunasekaran (US) Sergio Gusmeroli (IT)

Jairo Gutierrez (NZ) Tarek Hassan (UK) Raimo Hyötyläinen (FI) Tomasz Janowski (MO) Toshiya Kaihara (JP) Alexandra Klen (BR) Bernhard Koelmel (DE) Adamantios Koumpis (GR) George Kovacs (HU) Jarmo Laitinen (FI) Nada Lavrac (SI) Celson Lima (FR) Vladimir Marik (CZ) José M. Mendonça (PT) Karsten Menzel (DE) Arturo Molina (MX) Ugo Negretto (DE) Laszlo Nemes (AU) José M. Neves (PT) Shimon Y Nof (US) Ovidiu Noran (AU) Adegboyega Ojo (MO) Eugénio Oliveira (PT) Gus Olling (US) Martin Ollus (FI) Angel Ortiz (ES)

Kulwant Pawar (UK) Willy Picard (PL) Sofia Pinto (PT) Michel Pouly (CH) Kenneth Preiss (IL) Goran Putnik (PT) Ricardo Rabelo (BR) Heri Ramampiaro (US) Jukka Ranta (FI) Bob Roberts (UK) Rainer Ruggaber (DE) Hans Schaffers (NL) Weiming Shen (CA) Waleed W. Smari (US) Riitta Smeds (FI) António L. Soares (PT) Jorge P. Sousa (PT) Volker Stich (DE) Klaus-Dieter Thoben (DE) Peter Weiß (DE)

Luis Osório (PT)

Collaborative networks in action

Collaborative Networks (CN) is a fast developing area, as shown by the already large number of diverse real-world implemented cases and the dynamism of its related involved research community. Benefiting from contributions of multiple areas, namely communications and networking, science, computer engineering, management, economy, social sciences, law and ethics, etc., the area of Collaborative Networks is being consolidated as a new scientific discipline of its own.. On one hand significant steps towards a stronger theoretical foundation for this new discipline are being taken. On the other hand, a growing number of application cases are being developed and applied in industry and services. A good collection of active and emerging VO Breeding Environments and Professional Virtual Communities can be found in various regions of the world. This phenomenon is particularly evident in Europe where considerable investments in collaborative networks have been made in many of its regions.

Based on the experiences and lessons learned in many research projects and pilot cases developed during the last decade, a new emphasis is now being put on the development of holistic frameworks, combining business models, conceptual models, governance principles and methods, as well as supporting infrastructures and services. In fact, reaching the phase in which the computer and networking technologies provide a good starting basis for the establishment of collaborative platforms, the emphasis is now turning to the understanding of the collaboration promotion mechanisms and CN governance principles. Therefore, issues such as the value systems, trust, performance, and benefits distribution are gaining more importance. Encompassing all these developments, the efforts to develop reference models for collaborative networks represent a major challenge in order to provide the foundation for further developments of the CN.

PRO-VE represents a good synthesis of the work in this area, and plays an active role in the promotion of these activities. Being recognized as the most focused scientific and technical conference on Collaborative Networks, PRO-VE continues to offer the opportunity for presentation and discussion of both the latest research developments as well as the practical application case studies. Following the vision of IFIP and SOCOLNET, the PRO-VE conference offers a forum for collaboration and knowledge exchange among experts from different regions of the world.

This book includes a number of selected papers from the PRO-VE'06 conference, representing a comprehensive overview of recent advances in various domains and lines

of research and development on collaborative networks. Of particular relevance are the topics of modeling frameworks, value systems and competency management, trust building and risk, performance indicators and network management, collaboration platforms and tools, VO creation and negotiation, and applications in industry and services.

The PRO-VE'06 held in Helsinki, Finland, is the 7th event in a series of successful conferences including PRO-VE'99 (held in Porto, Portugal), PRO-VE 2000 (held in Florianopolis, Brazil), PRO-VE'02 (held in Sesimbra, Portugal), PRO-VE'03 (held in Lugano, Switzerland), PRO-VE'04 (held in Toulouse, France), and PRO-VE'05 (held in Valencia, Spain).

We would like to thank all the authors both from academia/research and industry for their contributions. We appreciate the dedication of the PRO-VE program committee members and other reviewers who helped both with the selection of articles and contributed with valuable comments to improve their quality. As a result of this cooperative and highly distributed work we hope that the PRO-VE'06 book constitutes a valuable tool for all those interested in the emerging applications, research advances, and challenges of the collaborative networks.

The editors,

Luis M. Camarinha-Matos
Faculty of Science and Technology
New University of Lisbon, Portugal

Hamideh Afsarmanesh Faculty of Science University of Amsterdam, The Netherlands

Martin Ollus VTT Industrial Systems, Finland