DIGITAL COMMUNITIES
IN A NETWORKED SOCIETY

e-Commerce, e-Business and e-Government
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.
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>FOREWORD</th>
<th>ix</th>
</tr>
</thead>
<tbody>
<tr>
<td>PREFACE</td>
<td>xiii</td>
</tr>
</tbody>
</table>

## SECTION 1: E-GOVERNMENT

1. E-GOVERNMENT – A ROADMAP FOR PROGRESS  
   R. Traunmüller, M. Wimmer  .......................................................... 3

2. REDUCING NORMATIVE AND INFORMATIVE ASYMMETRIES IN FISCAL MANAGEMENT FOR LOCAL ADMINISTRATIONS  
   M. Carducci, M. A. Bochicchio, A. Longo  ............................................. 13

## SECTION 2: BUSINESS MODELS OF E-APPLICATIONS

3. WHO ARE THE INTERNET CONTENT PROVIDERS?  
   C.C. Krueger, P.M.C. Swatman  .................................................................... 27

4. NET MARKET MAKERS IN THE AUSTRALIAN B2B E-SPACE  
   M. Singh  ........................................................................................................ 39

5. THE SUCCESS STRATEGIES FOR HYBRID BUSINESS MODEL  
   S. Vatanasakdakul, E. L. Boon Kiat, J. Cooper  ........................................... 51

## SECTION 3: INNOVATIVE STRUCTURES IN THE INTERNET

6. INFLUENCE OF ELECTRONIC BUSINESS TECHNOLOGIES ON SUPPLY CHAIN TRANSFORMATIONS  
   W. Cellary, S. Strykowski .............................................................................. 65

7. PRODUCT PLATFORMS FOR THE MEDIA INDUSTRY  
   L. Koehler, M. Anding, T. Hess  ......................................................................... 77

8. DYNAMIC MANAGEMENT OF BUSINESS SERVICE QUALITY IN COLLABORATIVE COMMERCE SYSTEMS  
   B. Roberts, A. Švirskas  .................................................................................... 89

9. SOFTWARE FOR THE CHANGING E-BUSINESS  
   M. Alaranta, T. Valtonen, J. Isoaho  .................................................................. 103
### SECTION 4: AUCTIONS AND E-PAYMENT

10. DYNAMIC ROI CALCULATIONS FOR E-COMMERCE SYSTEMS  
   M. Amberg, M. Hirschmeier ................................................................. 119

11. μP: A MICROPAYMENT SYSTEM  
   P.A.L. Mindlin, C.M. Schweitzer, T.C.M.B. Carvalho, W.V. Ruggiero .... 131

12. ELECTRONIC AUCTIONS IN FINLAND  
   V. K. Tuunainen, M. Rossi, J, Puhakainen ........................................... 143

### SECTION 5: FUTURE ASPECTS OF COMMUNICATION

13. I-CENTRIC COMMUNICATIONS  
   R. Popescu-Zeletin, S. Arbanowski, S. Steglich .................................... 157

14. A COMMUNICATION FRAMEWORK TOWARDS FLEXIBLE ASSOCIATIONS OF BUSINESSES IN EVOLVING ENVIRONMENTS  
   H. Ludolph, G. Babin, Peter Kropf .................................................... 175

15. INTRODUCING NEW BUSINESS MODELS IN PROVISION OF QOS NETWORKS  
   B.D. Jerman-Blažič .................................................................................. 187

### SECTION 6: INTERNET AND THE WEB

16. THE SEMANTIC WEB  
   R. Studer, S. Agarwal, R. Volz ................................................................ 203

17. WEB PERSONALIZATION BASED ON USER’S TRADE-OFFS  
   M. Martins, I. Garaffa, M. Kling ............................................................ 215

18. XML ALONE IS NOT SUFFICIENT FOR EFFECTIVE WEBEDI  
   F.G. Beckenkamp, W.Pree ....................................................................... 227

19. INSTITUTIONAL WEBSITES PERSONALIZATION USING MACRO AND MICRO USER PROFILES  
   P.S. Rodrigues Lima, M.S. Pimenta ...................................................... 239

### SECTION 7: ADVANCED PLATFORMS AND GRID COMPUTING

20. THE GRID: AN ENABLING INFRASTRUCTURE FOR FUTURE E-BUSINESS, E-COMMERCE AND E-GOVERNMENT APPLICATIONS  
   F. Silva, H. Senger ................................................................................. 253

21. INTER-ORGANIZATIONAL E-SERVICES ACCOUNTING MANAGEMENT ON COMPUTATIONAL GRIDS  
   F. Arcieri, F. Fioravanti, E. Nardelli, M. Talamo .................................... 267

22. A WEB SERVICES PROVIDER  
   J.-P. Bahsoun, B. Chebaro, S. Tawbi ................................................. 279
23. USING METAMODELS TO PROMOTE DATA INTEGRATION 
IN AN E-GOVERNMENT APPLICATION SCENARIO 
A. Figueiredo, A. Kamada, L. Damasceno, M. Mendes, M. Rodrigues.................. 293

SECTION 8:  COOPERATION AND INTEGRATION OF 
E-SERVICES

24. A SERVICE ORIENTED APPROACH TO INTERORGANISATIONAL 
COOPERATION 
C. Zirpins, W. Lamersdorf, G. Piccinelli.......................................................... 307

25. A DATA AND EVENT ORIENTED WORKFLOW PROCESS 
DEFINITION METAMODEL COHERENT WITH THE UML 
PROFILE FOR EDoc SYSTEMS 
J. Soto Mejía........................................................................................................ 319

26. XML-BASED E-CONTRACTING 
M. Merz.................................................................................................................. 333

27. ICT SUPPORT FOR EVOLVING HARMONIZATION OF 
INTERNATIONAL ALLIANCES 
R.M. Lee, E.D. Campillo....................................................................................... 345

28. MODELING FRAMEWORK FOR E-BUSINESS SYSTEMS 
M.M. Narasipuram .................................................................................................. 357

SECTION 9:  MODELING AND CONSTRUCTION OF 
E-SERVICES

29. REFERENCE MODELS FOR ADVANCED E-SERVICES 
C. A. Vissers, M.M. Lankhorst, R. J. Slagter......................................................... 369

30. MAPPING “ENTERPRISE BUSINESS ARCHITECTURE” TO 
“INFORMATION SYSTEMS FRAMEWORK” 
A. Yamaguchi, M. Suzuki, M. Kataoka................................................................. 395

31. A COTS-ORIENTED PROCESS FOR CONSTRUCTING 
ADAPTABLE E-GOVERNMENT SERVICES 
C. Ncube............................................................................................................... 415

32. ANALYSIS OF THE RELATION BETWEEN SERVICE PARAMETERS 
FOR SERVICE LEVEL MANAGEMENT AND SYSTEM UTILIZATION 
M. Akatsu, S. Konno, N. Komoda.......................................................................... 427

33. USE OF MODELS AND MODELLING TECHNIQUES FOR SERVICE 
DEVELOPMENT 
L. Ferreira Pires, M. van Sinderen, C. Guareis de Farias, 
J.P. Andrade Almeida.......................................................................................... 441
I3E International Program Committee

J. Adán Coello, Brazil
C. Arias Mendez, Chile
D. Avison, France
M. Bichler, Germany
W. Cellary, Poland
N. Cerpa, Chile
Y. Chen, USA
J. Cooper, Australia
R. Debreceny, Singapore
A. Economides, Greece
M. Funabashi, Japan
W. Golden, Ireland
R. Grimm, Germany
F. Kamoun, Tunisia
C. Kirner, Brazil
A. Iyengar, USA
W. Lamersdorf, Germany
R. Lee, Holland
C. Linnhoff-Popien, Germany
T. Magedanz, Germany
M. Mendes, Brazil (General Chair)
A. Molina, England
J. Monteiro, Portugal
V. Ouzounis, Belgium
C. Passos, Brazil (Progr Co-Chair)
H. Pohl, Germany
R. Rabelo, Brazil
K. Rannenberg, Germany
B. Roberts, England
H. Rudin, Switzerland
B. Schmidt, Switzerland
M. Singh, Australia
J. Soto Mejia, Colombia
K. Stanoevska, Switzerland
C. Steinfield, United States
L. A. M. Strous, Holland
R. Suomi, Finland (Progr.co-chair)
P. Swatman, Germany
S. Teufel, Switzerland
R. Traunmueller, Austria
A. Tsalgatidou, Greece
V. Tschammer, Germany
V. Tuunainen, Finland
H. Werthner, Italy
J. Wielki, Poland
H. Zimmermann, Switzerland
Y. Zhang, Australia

I3E Main Supporters and Sponsors

Centro de Pesquisas Renato Archer
International Federation for Information Processing
State Government of S.Paulo
Caixa Econômica Federal
Função de Estudos e Projetos
Função de Apoio à Pesquisa no Estado de S.Paulo
A Citizen-Centered State

Information is one of the basic resources of the society of the new millennium and therefore, a common asset in the realm of the government, the private initiatives, or the individual. Its generation, distribution and use should take place in a two-direction channel of easy access in order to be used productively by all.

Thus, the government should not only inform the population about the services it offers but also supply guidance about the use of the services offered.

That is the reason why the State has been changing its structure, so that it can increase efficiency and lower costs for the citizens. As a result, the use of information technology by the government has been a tool to facilitate such process.

The information transfer by electronic means has made the government to adopt a new style of administration, in other words, the e-government. E-government means a commitment with the use of information technology for the society. It will make possible the continuous improvement of the actions of the State focusing on the efficiency of the internal administration and establishing a system of information management to arrange internal processes and to speed up decision-making at all levels of the government. It also allows the establishment of an information network integrating the State Public Administration and the municipal and federal areas, and the Executive area to the Legislative and Judiciary areas, and facilitating democratic access to information by the citizens through its suitability to the socio-cultural reality of the majority of the population.

E-Government

E-government’s aim is to place the government within the reach of all citizens increasing transparency and citizen’s participation. Thus, the development of electronic government should promote universal access to government’s services, integrate administrative systems, networks, and databases, and make such information available to the citizens via Internet.

In the last decade, the rendering of public services in Brazil has been changing substantially. Some aspects are the indicators of an increasing
concern about the quality of the services rendered to the population: the proliferation of Customer Attendance Service in some state companies and the Ombudsman Systems in the majority of the public departments.

The recent practices of private companies that establish a relationship with their clients (CRM) have influenced the implementation of these channels of communication. Either effective or not, they have offered to the population the possibility of establishing an interaction with the public administration. On the other hand, with the advance of the democratic process in the country, the civil society has demanded, among many of their requirements, more transparency, speed and efficiency in the public administration.

Thus, we can observe, in all areas of the government, an increasing concern about projects of bureaucracy reduction (such as, the implementation of Programs of Bureaucracy Reduction of Federal and State Governments) and about initiatives that aim to shape the public services as the resulting products of administrative activities.

Following the same direction, the public departments in the last decade have been concerned about building indicators of attendance, implementing mechanisms of assessing productivity and quality, elaborating specific laws of protection of the user’s rights.

In this context, during the 1990’s, the creation of Citizen’s Services Centers (e.g. Poupatempo) in almost all the Brazilian states (nowadays 23 out of 27 existing States), which gather several agencies carrying out services from any area of the government in a unique space, has created a great advance on the answering of the demands of the civil society: initiatives which have contributed to improve significantly the image of the public service in Brazil.

Before these initiatives, the public services were considered archaic places, where reign the image of bureaucracy, lack of information and explanations, bleak workplaces and services rendered with no respect and dignity to the citizen. Today, the Citizen’s Services Centers have been transformed in paradigms of efficiency, effectiveness and respect to the citizens’ rights not only for the public administration but also for the private sector.

However, the facility introduced by these Centers, contributing to the performance of hundreds of services in a single space, do not resolve the problems of the citizens presented by the specification of public services. Even when carried out in one single space, the citizens are required to present several times the same personal data and documents to the rendering of several services in these Centers. In its relationship with the government, the citizen assumes several conditions: as a driver, a worker, a family supporter, someone with criminal records, a taxpayer, a customer (of gas,
electricity, etc). In other words, the rendering of each of these services depends on the database belonging to the different sectors of the public administration.

These sectarian databases, some of them built more than three decades ago, cannot respond to the new demands placed by the civil society that, as mentioned above, require a new type of relationship with the State. That means the need of a new structure of databases and information, which has the ability of incorporating these new demands and functionalities.

The significant public resources applied in the legacy, the difficult rescue of memory of transactional rules (not systematized or scarce documentation, absence of the assigned database programmers, etc) and the complexity of requirements and the used logic require the decision of how to solve the use and updating of the legacy simultaneously aiming the new demands by the current administrators of these systems.

On the other hand, we should consider that 90% of the public services rendered in Brazil are still in the presentational mode. The rendering of services by electronic means, also do not solve the mentioned fragmentation of the citizen in the several categories in which he/she is required to be submitted, according to the service carried out. On the contrary, the public sites reflect the division in sectors and similarly to the presentational mode, “force” the user to surf in several pages and to register several times the same demands to the rendering of the several services.

The great challenge presented in Brazil is the possibility of the construction of virtual citizen’s services centers, where it will be possible, by the integration of the legacy systems, the access to public services and information without the obligatory repeated certifications and where it will be possible to establish a new form of relationship between State and Citizen unlike the current fragmented one.

Conclusions

We can highlight some decisive factors in the implementation and success of initiatives for the use of Information and Communication Technology and that have been transforming and revolutionizing the State Government:

- Unconditional support and incentive by the governor;
- General policies: not many and flexible - prioritizing connectivity and its activities; the intensive use of existing resources; the obligatory participation by the administrators and of whom produces the information or service; the use of Intranet and Internet to speed up the exchange of information and to eliminate administrative divisions and excessive hierarchies;
Partnerships with suppliers under the guidance of the government;
- Priority on action and not on excessive planning, a willingness to learn from mistakes;
- The use of the existing legacy systems as much as possible to create new and better services;
- Flexibility to change;
- From the singular and anarchical spirit of the Internet, to stimulate and support the development of public servants’ and agencies’ ideals and projects;
- Absolute priority for digital inclusion programs.

However, all the efforts for the use of Information and Communication Technology in the building of the e-Government will not be successful if the government does not prioritize the universality of access to electronic means to the entire population, especially to the poor classes. Only by this way, it will achieve its main objective, that is, the implementation of the Electronic Democracy - e-Democracy – which allows the effective integration and participation of all the SP State’s 37 million citizens.

We are pleased to welcome IFIP I3E in our State, we recognize how important are the topics discussed and wish all a good reading of this book!

Roberto Meizi Agune
S. Paulo State Government
Dezember 2003
In the last years we have observed a accelerating evolution in the computerization of the society. This evolution, or should we call it a revolution, is dominantly driven by the Internet, and documented in several ways:

- The Information and Communication Technologies (ICT) bring, year per year, novelties: new processing architectures, new software methodologies, new systems and products, new communication networks. Distributed Processing Architectures spread in the Internet (e.g. Enterprise Distributed System, Distributed Object Computing, Grid Computing). Due to the proliferation of Platform and Middleware, some old software development approaches mature (e.g. MDA - Model Driven Architecture). In the field of Knowledge, the last years saw an interesting development of Metadata Techniques (e.g. based on MOF-OMG). Otherwise, representation of Knowledge and Semantic Processing, introduced in the past by the AI Community saw a strong push with the proposals of Semantic Web. And, without any question, the new communication technologies, bringing mobility, ubiquity and personalization, will change the ways in which individuals and public organizations perform their activities.

- The application fields of those technologies are expanding constantly transferring high benefits for the users, human beings (clients, consumers, citizens) and organizations (SME’s and big enterprises, public administration in the spheres of federal, state and local governments activities). Not only do the technologies cause profound modifications in the enterprise structures, but also give new tools to the quest for new organizational forms that bring more productivity and the chance of survival in the new global world of commerce, business and government. In Electronic Business, enterprises build production networks and proceed to expressive reorganization of their internal activities. And in Electronic Government, still in its infancy, practically all nations in the world -rich or poor - search the way to use ICT, to reach efficiency, and to eliminate old problems such as corruption. It is not yet possible to foresee the impacts for the citizen but, by sure, the old democracy is being reshaped.

We assembled, in this book, several contributions towards our title of

“Digital Communities in a Networked Society”
with base themselves on the papers, contributions and ideas discussed during the 3rd IFIP Conference I3E eCommerce, eBusiness and eGovernment, which took place in September in Guarujá, SP, Brazil.

Conference proceedings were distributed, containing 52 papers selected by the International Program Committee. The present book is a posterior effort, where 16 papers have been selected by the IPC and 25 other papers were proposed but subjected to major revisions. From them, 14 have been selected for the book. Besides that, five of our distinguished Keynote Speakers submitted papers. And finally 9 new papers have been submitted after the conference, and 4 of them have been selected to this volume, by the Editors. The book was organized in 9 sections comprising 33 chapters.

We want to express our words of gratitude to all of those that somehow contributed to the success of the Conference and helped compiling this book. First of all, to the hundreds of authors that spent precious time, bringing their ideas and work to paper. We regret that so much of them could not find their place in the book and, in fact, we were obliged to disconsider very good contributions, because of evident space restrictions. Then, we are very grateful for the members (and their co-workers) of the International Program Committee, for their evaluations, suggestions and discussions. A very special word of gratitude goes to the members of the Local Organizing Committees that were not only indefatigable but also able to introduce the kind and warm human Brazilian way of handling things around the conference.

Finally we have to thank the entities that participated as Organizers, Supporters and Sponsors. We traversed a difficult economical situation in Brazil during the organization of the event. The hard conflicts in other parts of the world had a profound influence during the year of 2003. Nevertheless, many organizations could support us with special means and some were able to grant generous financial support. From these we thank, specially, different entities of the State Government S.Paulo (e.g. Secretaria da Casa Civil, Imprensa Oficial), the federal Bank Caixa Econômica Federal, the federal agency FINEP and the SP research state agency FAPESP. This book would be impossible without their direct support.

The Editors

Manuel de Jesus Mendes, Cenpra / Unisantos, Brazil
Reima Suomi, Turku School of Economy, Finland
Carlos Passos, CenPRA, Brazil

Dezember 2003