

# Enhancing the design of e-Government: Identifying structures and modelling concepts in contemporary platforms

**Vassilis Meneklis**

University of Piraeus, Department of Informatics  
**[bmenekl@unipi.gr](mailto:bmenekl@unipi.gr)**

**Christos Douligeris**

University of Piraeus, Department of Informatics  
**[cdoulig@unipi.gr](mailto:cdoulig@unipi.gr)**



# Topics

- Introduction – Background and Motivations
- Structuration Theory (ST) concepts
- Provide a structurational perspective of e-Government evolution to date
- Use this perspective to identify and then define important concepts for architectural modelling of e-Government platforms
- Formally define these concepts to propose an extension of an existing framework for design (RM-ODP)
- Present the practical application of our work
- Conclusions and future work



# Background

- e-Government has benefited from various technical and social sciences
- Evolution of available enterprise services and implemented platforms, which is...
- driven by elevated user requirements and enhanced technologies, and...
- framed by legal regulations and social practices
- This process is oftentimes reversed



# Motivations

- Contemporary platforms comprise complex architectural models which lead to the need of creative and precise modelling methodologies
- The modelling attempts are (apart from other important factors) deeply influenced by the designer's perception of the system, in that respect...
- the conceptualization of the domain and the system that needs to be modelled plays a crucial role
- ST will be used to analyze and conceptualize the field of e-Government, thus helping towards a better understanding of the field and eventually towards more efficient efforts
- To achieve this we drew on relevant bibliography and personal experiences



# Structuration Theory Concepts

- ST introduced the concept of “*Duality of structure*”
- Structures are both the medium and the outcome of the practices which constitute social systems (functionalism versus interactionism)
- These structures are potentially malleable by “*knowledgeable*” human agents (elements of stability/change)
- “*Structuration*” is the structuring of social relations across time and space, in virtue of the duality of structure
- Social structures are connected to social actions through three modalities
  - Interpretive schemes
  - Norms
  - Resources



# Structuration Theory and Technology

- Initially there was no consideration for technology in ST
- There exist many adjoining points in the three modalities of structures and IS characteristics
- Adaptive Structuration Theory (DeSanctis, Poole)
- Enacted characteristics of technology identified by a structurational approach (Orlikowski)
- Through recurrent structuration some of these concepts become embodied (desktop metaphor)



# e-Government Evolution

- Approached the problem from two different directions...
- Structuring through Services, and...
- Structuring through Technologies
- We identified three periods of evolution for each case
- By analyzing and reporting these two processes of structuration we identified some important modelling concepts



# Structuring Through Services

- 1<sup>st</sup> phase - Simple web presence of public bodies (web presence, electronic governmental communication)
- 2<sup>nd</sup> phase - Electronic requests for conventionally processed services (electronic documents, availability)
- 3<sup>rd</sup> phase - Wholly electronic communication between platform and citizen, as well as service processing (service composition, orchestration, enterprise service)



# Structuring Through Technologies

- 1<sup>st</sup> phase - Primitive security and communication mechanisms (security mechanisms)
- 2<sup>nd</sup> phase - Internet as a democratic tool, strong security features, enhanced network protocols (e-participation, interoperability, electronic credentials, digital signatures, security policies, SMGOs)
- 3<sup>rd</sup> phase - Identity management protocols, Service Oriented Architectures (privacy policies, single-sign-on)



# Modelling Concepts

- Small to Medium Sized Governmental Organizations (SMGO)
- Enterprise service
- Electronic service
- Access mode
- Electronic document



# Modelling Framework

- Use the Reference Model for Open Distributed Processing systems (RM-ODP)
- RM-ODP defines five different yet interrelated viewpoints for system specification
- We extend its conceptual basis specifically for e-Government systems
- We relate each identified concept with one viewpoint language and provide appropriate structuring rules



# Research Framework

- Drew on related literature concerning e-Government platforms, and...
- on personal experiences from two European and two Greek e-Gov projects (eMayor, SELIS)
- Study of the project deliverables concerning architecture of the systems, and...
- of the meetings minutes, to...
- support our position concerning the need for a common conceptual basis among designers, developers, managers and all involved stakeholders



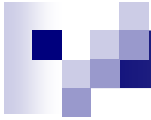
# Practical Application

- Experiences and concepts have been used in the design phase of a current European e-Gov project (SWEB - [www.sweb-project.org](http://www.sweb-project.org))
- Proposal for extension of the ISO standard RM-ODP
  - Extensions in standard ISO/IEC 10746-2: Foundations (section 8 Basic modelling concepts, section 14 Management concepts)
  - Extensions in standard ISO/IEC 10746-3: Architecture (sections 5-8 Enterprise, Information, Computational and Engineering languages)



# Conclusions and Future Work

- e-Government evolution is recursive in nature
- ST with its recursive character can fittingly analyze this process and help towards its conceptualization
- Our aim is to start a common conceptual basis for e-Government architectural modelling
- In the future we could:
  - Provide more concept definitions
  - Utilize different theories to theorize a continually evolving field (Metaphor Theory, Critical Realism, Habitus Theory)
  - Review and compare the results provided by different theories



Thank You!  
Questions?