



# **Deliverable D6.1: Publications of academic articles**

## **Ubiquitous participation platform for Policy making**

### **UbiPOL**

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**UbiPOL**

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**Executive summary:**

As part of the dissemination activities UbiPOL consortium published their academic results in international conferences and Journals. During the course of the project, the consortium published 7 journal papers, 16 conference papers, and 5 book chapters. In this deliverable we provide a summary of the UbiPOL publications. The research impact of UbiPOL is mainly in the research fields of opinion mining, privacy preserving data management, workflow technologies, information security and policy modeling. As a result of UbiPOL we developed a freely available tool that can be used for developing opinion mining lexicon and ontologies targeting researchers. A Demo of this tool was presented in the European Conference on Machine Learning.

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**Amendment History**

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30-04-2013	Third version of the document	Aggeliki TSOHOU, Brunel

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## Abbreviations and symbols

**Abb.** [*in alphabetic order*]: Full term meaning

**MSA:** Multiple Sensitive Attributes

**SBJ:** Subjective Words

## 1. Introduction

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This deliverable is the outcome of Task 6.1 within WP6 Workpackage “Dissemination and exploitation”. The objectives of WP6 are twofold: to make the UbiPOL results disseminated outside the consortium and to describe and update the roadmap of the exploitation of results by the project contractors. This deliverable focuses on the first of the two aspects and summarizes the dissemination efforts of the consortium and the achieved results during the project. Among the directions that the consortium looked into for the dissemination of UbiPOL research and development results or demonstrations of the integrated platform are a) publications in international journals and conferences, b) workshops, c) EU events, and d) commercial seminars.

To start with, the research conducted within the project and related academic results were published in international conferences and journals. The deliverable includes a list of those publications along with their abstracts in order to provide a more concrete idea of the research findings of the UbiPOL project. In summary, the consortium published 7 journal papers, 16 conference papers, and 5 book chapters.

The publications have contributed to the following areas:

- Policy making process modeling
- Workflow technologies for Policy Making
- E-Government through ubiquitous participation
- Privacy preserving reported issue retrieval
- Privacy preserving publication of opinion polls
- Sentiment Analysis and Opinion Mining

Second, the consortium has organized a special track on UbiPOL project in EMCIS 2012 (European, Mediterranean, and Middle East Conference on Information Systems). Additionally, UbiPOL project has been disseminated to the audience of two International Workshops on Transforming Government (2012, 2013). Finally presentations were made on the international workshops of "ePass and eID cards" (2011) and the International Symposium on Business Information Science Conference (2011).

We believe that UbiPOL consortium made a significant contribution to the state of the art in the above areas indicated by the list of publications included in the deliverable.

## 2. Publications

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### 2.1. Publications to Journals

- **(submitted)** An Android based New German eID Solution for Policy Making Processes

Abstract - The increased use of information technology and mobile devices promises to considerably improve both the provision of government services and the participation to Policy Making Processes (PMPs). The idea behind mobile participation (mParticipation) is to bring the Policy Making Processes closer to the daily life of the citizens. This means, the citizen should be able to post his opinion about any issue without any limitation related to time and space. Unfortunately, the current eParticipation solutions are not flexible enough to cope with the dynamicity required by the mobile participation. On the other side, security and privacy protection in eParticipation have been among the main issues addressed by the research community. Here again, the suggested solutions are based on heavy cryptographic techniques and cannot be ported to the mobile context in an efficient way. In the current paper, we propose a novel mobile based architecture that enforces security and privacy protection in the context of mParticipation. This architecture enables the citizens to cast their opinions anonymously and without limitation in time and space. It also removes the burden of preceding registration before any voting process. As the new electronic Identity (eID) Cards are replacing the conventional Identity cards in most European countries, we also discussed, in this paper, how the new German eIDcards can be utilized for mobile participation. The use of the eID cards offers better flexibility and stronger security. A prototype implementation of this architecture is also described in this document and the related performance is discussed.

Rebahi Y., Khalil M., Hohberg S. and Lorenz P. (submitted), An Android based New German eID Solution for Policy Making Processes, *International Journal of Information Security*

- **2013 Privacy Preserving Publishing of Opinion Polls.** *Computers and Security*, accepted.

Abstract – Public opinion is the belief or thoughts of the public regarding a particular topic, especially one regarding politics, religion or social issues. Opinions may be sensitive since they may reflect a person's perspective, understanding, particular feelings, way of life, and desires. On one hand, public opinion is often collected through a central server which keeps a user profile for each participant and needs to publish this data for research purposes. On the

other hand, such publishing of sensitive information without proper de-identification puts individuals' privacy at risk, thus opinions must be anonymized prior to publishing. While the anonymization of tabular data has been extensively studied, the proposed approaches do not readily apply to opinion polls. This is because opinions are generally collected on many issues, thus opinion databases have multiple sensitive attributes. Finding and enforcing anonymization models that work on datasets with multiple sensitive attributes while allowing risk analysis on the publisher side is not a well-studied problem. In this work, we identify the privacy problem regarding public opinions and propose a new probabilistic privacy model MSA-diversity, specifically defined on datasets with multiple sensitive attributes. We also present a heuristic anonymization technique to enforce MSA-diversity. Experimental results on real data show that our approach clearly outperforms the existing approaches in terms of anonymization accuracy.

**Ahmed Abdalaal, Mehmet Ercan Nergiz, Yücel Saygin** Privacy Preserving Publishing of Opinion Polls. *Computers and Security*, accepted, 2013.

- **2013 An Efficient Privacy-Preserving Multi-Keyword Search over Encrypted Cloud Data with Ranking.** *Distributed and Parallel Databases (special issue)*, accepted.

Abstract –Information search and retrieval from a remote database (e.g., cloud server) involves a multitude of privacy issues. Submitted search terms and their frequencies, returned responses and order of their relevance, and retrieved data items may contain sensitive information about the users. In this paper, we propose an efficient multi-keyword search scheme that ensures users' privacy against both external adversaries including other authorized users and cloud server itself. The proposed scheme uses cryptographic techniques as well as query and response randomization. Provided that the security and randomization parameters are appropriately chosen, both search terms in queries and returned responses are protected against privacy violations. The scheme implements strict security and privacy requirements that essentially disallow linking queries featuring identical search terms. We also incorporate an effective ranking capability in the scheme that enables user to retrieve only the top matching results. Our comprehensive analytical study and extensive experiments using both real and synthetic datasets demonstrate that the proposed scheme is privacy-preserving, effective, and highly efficient.

**Cengiz Örencik, Erkay Savas**, An Efficient Privacy-Preserving Multi-Keyword Search over Encrypted Cloud Data with Ranking. *Distributed and Parallel Databases (special issue)*, accepted, 2013.

- **2012 Workflow technology as an e-participation tool to support policy-making processes**, Journal of Enterprise Information Management.

Abstract – This paper aims to gauge the feasibility of workflow technology as a potential solution to facilitating citizen participation in policy-making processes. The gaps in and future direction of a current workflow models to be used to automate policy-making processes are to be discussed.

**Farhana Sajjad, Habin Lee, Muhammad Kamal, Zahir Irani.** Workflow technology as an e-participation tool to support policy-making processes, 10.1108 / 17410391111106301, 2011, "Journal of Enterprise Information Management, Vol. 24 Iss: 2, pp. 197 - 212".

- **2012 Supporting Public Policy Making Processes with Workflow Technology: Lessons Learned From Cases in Four European Countries.**

Abstract – Workflow technology has been proven as an enabler for numerous benefits for private and public organizations. Including: cost reduction, efficiency savings in terms of time and cost, increased capability, faster processing, reductions in errors, and work iterations, service quality and customer satisfaction. Public sector has endorsed these benefits by adopting workflow management systems to support administrative processes, such as human resources management or claims processing. This technology is yet to be utilized to support the formulation of policy making processes to facilitate the participation of citizens in the policy making processes and increase their awareness on political issues. This paper investigates the feasibility of adopting workflow tools for the support of decision making processes that lead to development of public policies, despite the variant institutional settings. To do so, public policy making processes from four countries were examined and analyzed. The results are explored further in the article.

**Aggeliki Tsohou, Habin Lee, Karim Al-Yafi, Vishanth Weerakkody, Ramzi El-Haddadeh, Zahir Irani, Andrea Ko, Tunc D. Meden, Luis Miguel Campos.** Supporting Public Policy Making Processes with Workflow Technology: Lessons Learned From Cases in Four European Countries, 10.4018/jegr. 2012070104, 2012, "International Journal of Electronic Government Research (IJEGR), Volume 8, Issue 3".

- **2011 Proposing a Knowledge Amphora Model for Transition towards Mobile Government.**

Abstract – As an important project for Turkey to achieve Information/Knowledge Society Strategic Goals, the e-Government Gateway currently focuses on the delivery of public services via a single portal on the Internet. In later stages, other channels such as mobile devices will be available for use, underlying a transition towards mobile and ubiquitous government services. In order to provide a supportive base for this transition, the authors develop a modeling of knowledge amphora (@), and link this conceptual model with the e-government gateway. Based on Knowledge Science concepts such as ubiquity, ba (physical, virtual, mental place for relationship-building and knowledge-creation), ma (time-space in-between-ness), reflection and refraction, the modeling of Knowledge Amphora incorporates the interactions @ the Internet and mobile devices that contribute to cross-cultural information transfer and knowledge creation. The paper presents recent electronic and mobile government developments of E-Government Gateway Project in Turkey as an application example of this philosophical and theoretical modeling. The contributed Ubiquitous Participation Platform for Policy Making (UbiPOL) project aims to develop a ubiquitous platform allowing citizens to be involved in policy making processes (PMPs). The resulting work is a practical case study as that develops new m-government operations.

**Tunc D. Medeni, Tolga Medeni , Asim Balci** . Proposing a Knowledge Amphora Model for Transition towards Mobile Government, 10.4018/jesma.2011010102,2011,"International Journal of E-Services and Mobile Applications (IJESMA), Volume 3, Issue 1",Paper

- **2011 Ubiquitous Participation Platform for POLicy Makings (UbiPOL): A Research Note.**

Abstract – The purpose of UbiPOL project is to develop a ubiquitous platform that allows citizens be involved in Policy Making Processes (PMPs) regardless of their current locations and time. However, literature highlights one of the foremost reasons that make citizens demotivated in engaging themselves in policy making—the ignorance of germane policies and PMPs within the government organizations. It is highly suggested that while more citizens find connections between their everyday life activities and pertinent government policies, the more they become pro-active or motivated to be involved in PMPs. For this reason, UbiPOL aims to provide ‘context aware knowledge’ provision with regards to policy making, i.e. through UbiPOL enabling citizens in identifying any relevant policies along with other citizens’ opinion ‘whenever they want’ ‘wherever they are’ according to their everyday life

pattern. As a result of this platform, citizens are anticipated to be more acquainted with the newest relevant policies and PMPs for their participation during their routine life activities. Moreover, this platform is also anticipated to provide policy tracking functionality through a ‘workflow engine’ and ‘opinion tag’ concept to improve the transparency of PMPs. As a final point, the platform intends to facilitate policy makers to collect citizen opinions more efficiently as the opinions are collected as soon as they are created in the middle of citizen’s everyday life. UbiPOL provides security and identity management facility to ensure only authorized citizens can have access to relevant policies according to their roles in PMPs. The delivery of the opinion and policy data over the wireless network is secure as the platform use leading edge encryption algorithm in its communication kernels. UbiPOL is a scalable platform ensuring at least 100,000 citizens can use the system at the same time (e.g., for e-Voting applications) through its well proven automatic load balancing mechanisms. The privacy ensuring opinion mining engine prevents unwanted revealing of citizen identities and the mining engine prevents any unrelated commercial advertisements are included in the opinion base to minimize the misuse of the system.

**Zahir Irani, Habin Lee, Vishanth Weerakkody, Muhammad Kamal, Shaun Topham.** Ubiquitous Participation Platform for POLicy Makings (UbiPOL): A Research Note, 10.4018 / jegr.2010102006,2011,"International Journal of Electronic Government Research (IJEGR), Volume 6, Issue 1",Paper

## ***2.2. Publications to Conferences/Workshops***

- **2013 SU-Sentilab : SemEval-2013 Task 2: Sentiment Analysis in Twitter, (accepted).**

Abstract- Sentiment analysis refers to automatically extracting the sentiment present in a given natural language text. We present our participation to the SemEval2013 competition, in the sentiment analysis of Twitter and SMS messages. Our approach for this task is the combination of two sentiment analysis subsystems which are combined together to build the final system. Both subsystems use supervised learning using features based on various polarity lexicons.

**Gizem Gezici, Rahim Dehkharghani, Berrin Yanikoglu, Dilek Tapucu, Yucel Saygin,** SU-Sentilab : SemEval-2013 Task 2: Sentiment Analysis in Twitter, SEMEVAL-2013, International workshop on Semantic Evaluation .

- **2012 New Features for Sentiment Analysis: Do Sentences Matter?.**

Abstract –In this work, we propose and evaluate new features to be used in a word polarity based approach to sentiment classification. In particular, we analyze sentences as the first step before estimating the overall review polarity. We consider different aspects of sentences, such as length, purity, irrealis content, subjectivity, and position within the opinionated text. This analysis is then used to find sentences that may convey better information about the overall review polarity. The TripAdvisor dataset is used to evaluate the effect of sentence level features on polarity classification. Our initial results indicate a small improvement in classification accuracy when using the newly proposed features. However, the benefit of these features is not limited to improving sentiment classification accuracy since sentence level features can be used for other important tasks such as review summarization.

**Gizem Gezici, Berrin Yanikoglu, Dilek Tapucu, Yucel Saygin**, New Features for Sentiment Analysis: Do Sentences Matter?, 2012, SDAD 2012, The 1st International Workshop on Sentiment Discovery from Affective Data Workshop co-located with The European Conference on Machine Learning and Principles and Practice of Knowledge Discovery in Databases (ECML PKDD) Bristol, UK, September 28, 2012, 5-15.

- **2012 A location based persuasive information system for public consultation: An elaboration likelihood mode approach.**

Abstract - Facilitating citizen participation in policymaking processes is vitally important for a sustainable policy implementation in the public sector. Governments have often expressed concern in the lack of engagement of citizens in the development of public policy. This paper proposes a persuasive computing system, called UbiPOL, to support location based citizens' participation in policymaking. Based on elaboration likelihood model, the system identifies three persuasive features for a participation support system and explains how such features are incorporated in the design UbiPOL system. In particular, it introduces opinion tag concept to link policy related issues with point-of-interest (POI) within a specific geographical location enabling citizens to identify any policy issues and participate in policymaking processes throughout their daily activities. Opinion tag constructs are introduced to maintain policy abstracts as well as location information. This plays a key role in the model to help identify participants, timing of their involvement, and how they can participate in public consultations. Finally, this paper explains how the persuasive features based on ELM will be verified via real world field trials in the UK.

**Tsohou A., Lee, H., and Barbos, M.** (2012). A location based persuasive information system for public consultation: An elaboration likelihood mode approach. The 2nd international workshop on advanced service management, Matsmoto, Japan, 29 – 30 Aug 2012.

- **2012 Learning Domain-Specific Polarity Lexicons.**

Abstract –Sentiment analysis aims to automatically estimate the sentiment in a given text as positive or negative. Polarity lexicons, often used in sentiment analysis, indicate how positive or negative each term in the lexicon is. However, since creating domain-specific polarity lexicons is expensive and time consuming, researchers often use a general purpose or domain independent lexicon. In this work, we address the problem of adapting a general purpose polarity lexicon to a specific domain and propose a simple yet effective adaptation algorithm. We experimented with two sets of reviews from the hotel and movie domains and observed that while our adaptation techniques changed the polarity values for only a small set of words, the overall test accuracy increased significantly: 77% to 83% in the hotel dataset and 61% to 66% in the movie dataset.

**Gülşen Demiröz, Berrin Yanikoglu, Dilek Tapucu, Yucel Saygin,** Learning Domain-Specific Polarity Lexicons, ISBN: 978-1-4673-5164-5, IEEE 12th International Conference on Data Mining Workshops, ICDM Workshops 2012: 674-679.

- **2012 An Aspect-lexicon Creation and Evaluation Tool for Sentiment Analysis Researchers.**

Abstract – In this demo paper, we present SARE, a modular and extendable semi-automatic system that 1) assists researchers in building gold-standard lexicons and evaluating their lexicon extraction algorithms; and 2) provides a general and extendable sentiment analysis environment to help researchers analyze the behavior and errors of a core sentiment analysis engine using a particular lexicon.

**Musab Husani, Ahmet Kocyigit, Dilek Tapucu, Berrin Yanikoglu, Yucel Saygin.** An Aspect-lexicon Creation and Evaluation Tool for Sentiment Analysis Researchers, ISBN: 978-3-642-33485-6 doi>10.1007/978-3-642-33486-3\_51 ECML PKDD'12 Proceedings of the 2012 European conference on Machine Learning and Knowledge Discovery in Databases - Volume Part II, 804-807.

- **2012 Adaptation and Use of Subjectivity Lexicons for Domain Dependent Sentiment Classification.**

Abstract- Sentiment analysis refers to the automatic extraction of sentiments from a natural language text. We study the effect of subjectivity-based features on sentiment classification on two lexicons and also propose new subjectivity-based features for sentiment classification. The subjectivity-based features we experiment with are based on the average word polarity and the new features that we propose are based on the occurrence of subjective words in review texts. Experimental results on hotel and movie reviews show an overall accuracy of about 84% and 71% in hotel and movie review domains respectively; improving the baseline using just the average word polarities by about 2% points.

**Rahim Dehkharghani, Berrin Yanikoglu, Dilek Tapucu, Yucel Saygin,** Adaptation and Use of Subjectivity Lexicons for Domain Dependent Sentiment Classification, ISBN: 978-1-4673-5164-5, IEEE 12th International Conference on Data Mining Workshops, ICDM Workshops 2012: 674-679.

- **2012 Efficient and secure ranked multi-keyword search on encrypted cloud data.**

Abstract –Information search and document retrieval from a remote database (e.g. cloud server) requires submitting the search terms to the database holder. However, the search terms may contain sensitive information that must be kept secret from the database holder. Moreover, the privacy concerns apply to the relevant documents retrieved by the user in the later stage since they may also contain sensitive data and reveal information about sensitive search terms. A related protocol, Private Information Retrieval (PIR), provides useful cryptographic tools to hide the queried search terms and the data retrieved from the database while returning most relevant documents to the user. In this paper, we propose a practical privacy-preserving ranked keyword search scheme based on PIR that allows multi-keyword queries with ranking capability. The proposed scheme increases the security of the keyword search scheme while still satisfying efficient computation and communication requirements. To the best of our knowledge the majority of previous works are not efficient for assumed scenario where documents are large files. Our scheme outperforms the most efficient proposals in literature in terms of time complexity by several orders of magnitude.

**Cengiz Orencik, Erkay Savas**, Efficient and secure ranked multi-keyword search on encrypted cloud data. EDBT/ICDT Workshops, pp. 186-195 ISBN: 978-1-4503-1143-4. ACM, 2012.

- **2012 Evaluating M-Government Applications: An Elaboration Likelihood Model Framework.**

Abstract – Evaluating and optimizing e-government services is imperative for governments especially due to the capacity of e-services to transform public administrations and assist the interactions of governments with citizens, businesses and other government agencies. Existing widely applied evaluation approaches neglect to incorporate citizens’ satisfaction measures. Several citizen satisfaction models and indicators have been suggested in academia; however a reference process model that can assist practitioners to apply these performance measures is missing. In this paper we draw upon the evaluation approach proposed by the EU funded project CEES and propose a reference process model that captures re-usable practices for e-government evaluation from a citizens’ perspective. The novelty of the proposed approach is that using DEA for evaluating the e-services the assessment results in suggestions for strategic improvement of the e-services.

**Aggeliki Tsohou, Karim Al-Yafi, Habin Lee**, Evaluating M-Government Applications: An Elaboration Likelihood Model Framework, ISBN: 978-1-908549-03-7,2012,"European, Mediterranean & Middle Eastern Conference on Information Systems (EMCIS 2012) ".

- **2012 UBIPOL Approach to Improve Policy Making Processes: Strengths and Weaknesses**

Abstract - Citizens are often de-motivated in engaging themselves in policy making. For this reason, UbiPOL project aims to develop a ubiquitous platform that allows citizens be involved in Policy Making Processes (PMPs) regardless of their current locations and time. Ubipol system was designed to engage citizens in the policy-making process, which requires more informed and active citizens. This paper analyses strengths and weaknesses of Ubipol product, compares it with main competitors, and defines the targeted market specificities. We investigate Ubipol solution from knowledge management view and provide an overview of evaluation approaches for eParticipation projects and tools.

**Andrea Kó, Tunc Medeni (2012)**. UBIPOL Approach to Improve Policy Making Processes: Strengths and Weaknesses, In CD-ROM/Online Proceedings of the 9th European,

Mediterranean & Middle Eastern Conference on Information Systems (EMCIS) 2012, Late Breaking Papers, 2012, 7-8 June, Hotel Vier Jahreszeiten Maximilianstraße, Munich, Germany Editors: Dr Ahmad Ghoneim, Prof. Ralf Klischewski, Holger Schrödl, Dr Muhammed Kamal, ISBN: 978-1-908549-03-7

- **2012 Based Opinion Mining for Public Agencies**

Abstract - Ontologies have a special role in the UBIPOL system, they help to structure the policy related context, provide conceptualization for policy domain and use in the opinion mining process. In this work we presented a system called Ontology Based Opinion Mining Engine (OBOME) for analyzing a domain-specific opinion corpus by first assisting the user with the creation of domain ontology from the corpus. Then we determined the polarity of opinion on the various domain aspects. In the former step, the policy domain aspect has are identified (namely which policy category is represented by the concept). This identification is supported by the policy modeling ontology, which describe the most important policy – related classes and structure. Then the most informative documents from the corpus are extracted and asked the user to create a set of aspects and related keywords using these documents. In the latter step, we used the corpus specific ontology to model the domain and extracted aspect-polarity associations using grammatical dependencies between words. Later, summarized results are shown to the user to analyze and store. Finally, in an offline process policy modeling ontology is updated.

**Dilek Tapucu, Andrea Kó, Yucel Saygun, Habin Lee (2012):** Ontology Based Opinion Mining for Public Agencies, In CD-ROM/Online Proceedings of the 9th European, Mediterranean & Middle Eastern Conference on Information Systems (EMCIS) 2012, Late Breaking Papers, 2012, 7-8 June, Hotel Vier Jahreszeiten Maximilianstraße, Munich, Germany Editors: Dr Ahmad Ghoneim, Prof. Ralf Klischewski, Holger Schrödl, Dr Muhammed Kamal, ISBN: 978-1-908549-03-7

- **2012 OBOME - Ontology Based Opinion Mining in UBIPOL.**

Abstract – Ontologies have a special role in the UBIPOL system, they help to structure the policy related context, provide conceptualization for policy domain and use in the opinion mining process. In this work we presented a system called Ontology Based Opinion Mining Engine (OBOME) for analyzing a domain-specific opinion corpus by first assisting the user with the creation of a domain ontology from the corpus. We determined the polarity of opinion on the various domain aspects. In the former step, the policy domain aspect has are identified

(namely which policy category is represented by the concept). This identification is supported by the policy modelling ontology, which describe the most important policy – related classes and structure. Then the most informative documents from the corpus are extracted and asked the user to create a set of aspects and related keywords using these documents. In the latter step, we used the corpus specific ontology to model the domain and extracted aspect-polarity associations using grammatical dependencies between words. Later, summarized results are shown to the user to analyze and store. Finally, in an offline process policy modeling ontology is updated.

**Dilek Tapucu, Andrea Ko, Musab Husani, Ahmet Kocyigit, Habin Lee**, OBOME - Ontology Based Opinion Mining in UBIPOL. ISBN: 978-1-908549-03-7,2012,"European, Mediterranean & Middle Eastern Conference on Information Systems (EMCIS 2012)".

- **2012 Policy Modeling in Risk-driven Environment.**

Abstract – In this paper, the main challenges of applying ICT in policy modeling are described and a solution is proposed, which emphasizes policy impact exploration, monitoring and risk management. State of the art of policy modeling is given, with the summary of those features of our solution, which goes beyond the available approaches. The paper will be structured as follows: First, the challenges of the ICT utilization for policy modeling are detailed. Next theoretical background of policy modeling is discussed, followed by research overview. The proposed solution -- policy modeling cycle and the corresponding system is presented in the following section. Finally, conclusion and future work are shown.

**Andrea Kő, András Gábor, Zoltán Szabó** Policy Modeling in Risk-driven Environment, 10.1145 / 2072069.2072101,2011,5th International Conference on Theory and Practice of Electronic Governance.

- **2012 Ontology Supported Policy Modeling in Opinion Mining Process**

Abstract - In e-Society the spreading services offered by Social Web has changed the way of communication and cooperation among citizens, policy-makers, governance bodies and civil society actors. One of the main goals of policymakers is to motivate citizens for participation in policy-making processes. UbiPOL ((Ubiquitous Participation Platform for Policy-making, ICT-2009.7.3(ICT for Governance and Policy Modelling), 2009-2011) aimed to develop a ubiquitous solution, which emphasizes citizens' participation in policy-making processes (PMPs) regardless of their current location and time. Ontology-based opinion mining component of Ubipol system has a crucial role in citizens' commitment, because it empowers

them to contribute in policy making. This paper presents the ontology-based semi-automatic approach and tool for sentiment analysis in UbiPOL system, which includes lexicon extraction from a large corpus of documents. Aspect-based opinion summarization of user reviews and its combination with domain ontology development are discussed as well.

**Musab Husaini, Andrea Kő, Dilek Tapucu, and Yücel Saygın (2012):** Ontology Supported Policy Modeling in Opinion Mining Process in. Herrero et al. (Eds.): OTM 2012 Workshops, LNCS 7567, pp. 252–261, 2012. @ Springer-Verlag Berlin Heidelberg 2012, ISBN 978-3-642-33617-1,978-3-642-33618-8; [http://link.springer.com/chapter/10.1007%2F978-3-642-33618-8\\_34](http://link.springer.com/chapter/10.1007%2F978-3-642-33618-8_34)

- **2012 Ubiquitous Participation Platform for POLicy Making (UbiPOL): Security and Identity Management Considerations.**

Abstract –Facilitating citizen participation in policy making processes is vitally important for a sustainable policy implementation in the public sector. Governments have often expressed concern in the lack of engagement of citizens in the development of public policies. Motivating citizens to participate and engage in the policy making processes has been a challenging task and public authorities are yet to find satisfactory solutions [1]. Researchers have also highlighted the need for new governance models which will enable the wider and the deeper participation of citizens in policy making processes [2]. UbiPOL (Ubiquitous Participation Platform for Policy Making) is research project funded under the EU FP7 Programme that targets to address these issues. UbiPOL is an e-government platform that employs a new governance model in which citizens can participate in policy making processes in the middle of their everyday life overcoming spatial and time barriers. The core of the governance model is a ubiquitous participation platform that motivates its users to be involved in policy making processes. The system will utilise location-based notification services with the aim to alert citizens for consultation requirements about policies that are relevant to them when they are moving around physical places in their everyday life. Although location-based services have been used to influence citizen/consumer behaviors in many fields, such as tourism, marketing or education, they have not been used to engage citizens in the policy making processes. Moreover, UbiPOL retrieval services are designed to provide citizens only with the policies that are relevant to their personal preferences and necessities. Additionally, UbiPOL policy sharing services enable citizens to view other citizens' opinion on a specific policy issue without revealing their identity. Finally, the platform will provide policy tracking functionality via a workflow engine and opinion tag concept to improve the transparency of the policy making processes.

**Aggeliki Tsohou, Habin Lee, Yacine Rebahi, Mateusz Khalil, Simon Hohberg**  
Ubiquitous Participation Platform for POLicy Making (UbiPOL): Security and Identity Management Considerations, 10.1007/978-3-642-32287-7\_29,2012,"Trust, Privacy and Security in Digital Business (TrustBus 2012)".

- **2011 Information Society Strategy & E-government Gateway Development in Turkey: Moving Towards Integrated Processes and Personalized Services.**

Abstract – This case study mainly analyses information society strategy and e-government development in Turkey. Based on available and analysed numeric data on evaluation reports and citizen feedback, the resulting paper discusses that inter-institutional coordination is increasingly needed for integration and orchestration of different government services. The paper also suggests the further personalization of citizen-centric services for future development.

**Tunç D. Medeni, Alpay Erdem, Ibrahim H. Osman, Abdel Latef Anouze, Zahir Irani, Habin Lee, Asim Balci, Vishanth Weerakkody,** Information Society Strategy & E-government Gateway Development in Turkey: Moving Towards Integrated Processes and Personalized Services, ISBN 978-1-902316-84-0, 2011, Tgovernment workshop 2011.

- **2011 UbiPOL: A Platform for Context-aware Mobile Device Applications in Policy Making,**

[http://www.thinkmind.org/index.php?view=article&articleid=ubicomm\\_2011\\_11\\_20\\_10113,2011](http://www.thinkmind.org/index.php?view=article&articleid=ubicomm_2011_11_20_10113,2011),"UBICOMM 2011, The Fifth International Conference on Mobile Ubiquitous Computing, Systems, Services and Technologies".

Abstract – UbiPOL is a context-aware platform for policy making. At its core, the UbiPOL platform has an essential framework of web services and APIs. It is intended to aid and support the development of location-based and context-aware applications in the field of policy making. Software developers can make use of UbiPOL generic web services and APIs to develop new context-aware policy making applications for mobile devices, leveraging the built in support for Location-based Services of the platform. The paper gives a generic presentation of the UbiPOL platform focusing on the provisioning of location-based and context-aware mobile device applications in the field of policy making.

**Barbos, M., Pop E., Lee, H., Campos, L.M. (2011),** UbiPOL: A Platform for Context-aware Mobile Device Applications in Policy Making, ,In UBICOMM 2011 The Fifth International

Conference on Mobile Ubiquitous Computing, Systems, Services and Technologies.  
[http://www.thinkmind.org/index.php?view=article&articleid=ubicomm\\_2011\\_11\\_20\\_10113,2011](http://www.thinkmind.org/index.php?view=article&articleid=ubicomm_2011_11_20_10113,2011)

### 2.3. Book Chapters

- **2012 Text mining with Rapidminer.** (Accepted/In Press)

Abstract –The goal of this chapter is to introduce the text mining capabilities of RAPIDMINER through a use case. The use case involves mining reviews for hotels at TripAdvisor.com, a popular web portal. We will be demonstrating basic text mining in RAPIDMINER using the text mining extension. We will present two different RAPIDMINER processes, namely Process01 and Process02, which respectively describe how text mining can be combined with association mining and cluster modeling. While it is possible to construct each of these processes from scratch by inserting the appropriate operators into the process view, we will instead import these two processes readily from existing model files. Throughout the chapter, we will at times deliberately instruct the reader to take erroneous steps that result in undesired outcomes. We believe that this is a very realistic way of learning to use RAPIDMINER, since in practice, the modeling process frequently involves such steps that are later corrected.

**Gürdal Ertek, Dilek Tapucu, Inanç Arin** (2012), *Text mining with rapidminer*. In: Hofmann, Markus and Klinkenberg, Ralf, (eds.) *Use Cases with RapidMiner*. John Wiley & Sons, USA. (Accepted/In Press)

- **2012 E-Government Developments in Turkey for Supporting Public Sector Transformation.**

Abstract – This work presents the specific case of Turkey for public sector transformation by e-Government services development. The Turkish case will be presented with an aim to provide interesting and useful information for practitioners as well as academicians in the field of e-government and public transformation, and a focus on central government examples and policy orientations affecting daily lives of citizens. The rationale and perspective of the paper reflects practitioners' viewpoint, and assumes that the experiences of Turkey case will have echoes on other places, as the experienced and discussed issues have common characteristics with other cases. This practitioner analysis chapter is then based on the co-authors' personal involvement in and reflections on the various aspects of the Turkish case, while the chapter is written mostly as a result on secondary research. These reflective analyses are embedded within background information about e-government development in Turkey, presented together with academic perspective of transformational government. E-Government Gateway,

MERNIS, UYAP, e-tax projects in Turkey are specifically highlighted. A discussion of policy orientations that affect daily lives of citizens follows, and suggestions for future work and directions are also provided. The discussion especially underlines the shared service and citizen-oriented approach to e-government service development with implications for process integration and improvement, if not yet for thorough transformation. It is hoped that the reflections and directions with respect to Turkish case presented in this work provides useful guidelines for new e-government initiatives in Turkey and all around the world.

**Asim Balci, Tunc Medeni, E-Government Developments in Turkey for Supporting Public Sector Transformation**, 10.4018 / 978-1-60960-839-2.ch013,2011,Public Sector Reform Using Information Technologies: Transforming Policy into Practice,Book Chapter

- **2012 Improving Take-Up of e-Government Services in Turkey (and EU)**

**Purpose** — The e-Government take-up gap for citizen services is a crucial problem for Turkey. This paper discusses selected innovative initiatives aiming to address this take-up gap in Turkey mainly reflecting the contributions of Turksat, Turkey, as a partner of project consortiums of the related work.

**Methodology/approach** — The content comes from the co-authors' affiliated institutions' contributions to EU frameworks as leading-edge research work. Thus the paper documents the suggested innovative ideas as well as available practical and academic implications of these ongoing works as called CEES and UbiPOL, as well as future works in the form of leading-edge project plans.

**Findings** — A reflection of the original rational and/or (expected) outcomes of the EU projects discussed such as the importance of regularly measuring citizen satisfaction in order to provide input for service improvement and sophistication with respect to citizen needs and motivations (CEES), enabling citizens' finding connections between their as-usual life activities and relevant (local) government policies via the use of ubiquitous electronic devices (UbiPOL), establishing cloud computing solutions to comprehensively match the needs of disadvantaged (disabled) users and provision of local government services (new proposal), practical cross-border, interoperable services with eID use (even for noncitizens) (new proposal) for increasing take-up.

**Limitations/implications** — The discussed works are still work-in-progress with potential, however yet-to-be realized implications.

**Originality/value**—The paper provides information on innovative, state-of-heart EU works with valuable findings, as well as a specific approach that reflects the case of one special developing country, Turkey.

Medeni TD, Balci A., Kaplan, A., Medeni, İT. (2012), Improving Take-Up of e-Government Services in Turkey (and EU): Suggestions from Practice In Turkey, M A Shareef, N Archer, Y K. Dwivedi, A Mishra, S K. Pandey (Eds) Transformational Government Through E-Gov Practice: Socioeconomic, Cultural and Technological Issues. Emerald

- **2011 The Demand Side for Development of E-Government Services and Gateway in Turkey:** Taking Citizen Perceptions and Suggestions into Account, 10.4018/978-1-60960-601-5.ch006, 2011, Stakeholder Adoption of E-Government Services: Driving and Resisting Factors.

Abstract – Representing the co-authors’ academic and practitioner background, this chapter provides the most-up-to-date information for an ongoing work on citizen-oriented e-government initiatives. The purpose of this work follows the importance, priority, and necessity of paying attention to citizen side, and aims to improve understanding and better address the citizen demands and expectations towards e-government public transformation. The research aims to question and understand better what citizens think regarding the currently available e-government services in Turkey. In response to this purpose and question, this work-in-progress chapter presents secondary information from literature review and context of the ongoing practical and academic works, and primary findings from both a preliminary and a recent study. These presented information and findings mostly represent practitioners’ viewpoint that is mostly based on the authors’ professional, academic, and personal involvement in the various aspects of the Turkey case, and in return are expected to provide certain input for the on-going practical affairs. As the research is a work-in-progress that traces long-lasting development and ongoing operations of e-government in practice, at this point, providing some suggestions and directions rather than concrete practical and theoretical implications is considered to have the most value. As a result, security, trust, ease of use, service, and information quality are determined to be significant for citizens’ perceptions and suggestions as factors that affect their usage of e-government services in Turkey. The resulting chapter first provides a relevant literature review then information about the history and latest developments in e-government from the perspective of citizen side. Following this background information, the preliminary descriptive study on citizen perceptions of demands and expectations conducted last year is reminded. Build upon these ongoing researches on the academic and practical side, latest research findings as a result of analysing citizens suggestions for E-Government Gateway (EGG) in Turkey are also shared. Finally, suggestions for future based on latest work are given.

**D. Tunç Medeni, Yasemin Çetin , Asim Balci , Sevgi Özkan .** The Demand Side for Development of E-Government Services and Gateway in Turkey: Taking Citizen Perceptions and Suggestions into Account,10.4018/978-1-60960-601-5.ch006,2011,Stakeholder Adoption of E-Government Services: Driving and Resisting Factors, Book Chapter

- **2011 eParticipation and Policy-making Support in Ubipol Approach**

Abstract- The spreading services offered by Social Web, and a variety of participatory tools such as web and opinion-mining systems, online social networking, blogs, wikis, and forums, present policy-makers, governance bodies and civil society actors with an opportunity to bring about notable changes in the way future societies function. We currently do not have appropriate decision-making models, process flows, or analytical and forecasting tools to properly understand, interpret, visualise, act upon, and harness the forces that may be unleashed. Policy-makers need feedback about their initiatives in order to align public policies with emerging civil society needs, requirements and expectations, while civil society is in need of transparency in the policy-making process. One of the main challenges in this respect is that public policies have to operate in complex, shifting environments structured by several intervening factors related to the forces of change at global, EU, national, and regional levels. This chapter will detail policy modelling and governance-related problems and challenges and provide an overview of the Ubipol project approach and its IT environment as an example of compliance with needs as summarised. UbiPOL ((Ubiquitous Participation Platform for Policy-making, ICT-2009.7.3 (ICT for Governance and Policy Modelling), 2009-2011) aims to develop a ubiquitous platform that allows citizens to become involved in policy-making processes (PMPs) regardless of their current location and time.

**Kó, A., (2011),** ‘eParticipation and Policy-making Support in Ubipol Approach’, Communication with the Public from the Local Government Perspective, ed. by: Ágnes Jenei, ISBN 978-963-503-485-7, Ad Librum Ltd, Budapest, 195-205.

### 3. Other Dissemination Activities

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#### *3.1. Special Tracks in International Workshops and Conferences*

- **Special track on UbiPOL project in EMCIS 2012 (European, Mediterranean, and Middle East Conference on Information Systems).**

In the special track, all UbiPOL partners presented their work to the audiences invited from Europe, US, and Far East. The conferences had around 120 attendees consisting of academics in eGovernment and policy makers in local and central authorities.

**Campos L. M., Mihai Barbos**, Ubiquitous Participation Platform for Policy Making Processes, EMCIS 2012, Munich, Germany, June 2012 (Presentation).

**Rebahi Y., Khalil M., Hohberg S.**, EID Based Authentication for E-Government Services, EMCIS 2012, Munich, Germany, June 2012 (Presentation).

**Campos L. M. and Al-Yafi, K.**, UBIPOL DEMO, EMCIS 2012, Munich, Germany, June 2012 (Presentation of Demo).

**Al-Yafi, K., Dabali, A. and Gurcan, I. (Turkey)**, A Location Based Policy Making Workflow Engine, EMCIS 2012, Munich, Germany, June 2012 (Presentation).

**Al-Yafi K.**, PMWF DEMO, EMCIS 2012, Munich, Germany, June 2012 (Presentation of Demo).

#### *3.2. Presentations to International Workshops and Conferences*

- **Presentations to the International Workshop on Transforming Government (2012, 2013)**

The current stage and results of UbiPOL were presented in the workshop organized by Brunel in April 2012 and March 2013. Academics that work in eGovernment area gather yearly in the project to present their research outcomes. Furthermore practitioners and policy makers from the government also participate in the effort to bring together the academic results and the public administration practice.

**Lee, H. (2012)** Persuasive Computing for mParticipation – ICT application to eGovernance, International Workshop on Transforming Government, London, UK, May 2012.

**Lee, H. (2013)** Opinion collection and analysis through ubiquitous participation platform (UbiPOL). International Workshop on Transforming Government, London, UK, March 2013.

- **Presentation to the ePass and eID cards conference (2011)**

**2011 How the UbiPOL security solution is built and how the eID solution could be used,** <http://www.eid-epass.org/>,2011,"ePass and eID cards conference in Istanbul, Turkey , 24-25".

- **Presentation to International Symposium on Business Information Science Conference (2011)**

**Kó, A., (2011)** ‘Ubiquitous Participation Platform for Policy Making’, ISBIS’2011 International Symposium on Business Information Science Conference, Hungary, November 2011, Győr, Hungary.

### **3.3. Keynote Speeches**

- **Keynote Speech on UbiPOL in ICEBEG2011**

**Lee, H. (2011),** UbiPOL: Ubiquitous participation platform for policy making processes, ICEBEG2011, Antalya, Turkey, April 2011.

## 4. CONCLUSION

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UbiPOL project incorporated significant research activities whose results were published in international conferences and journals as well as book chapters. UbiPOL brought together an interdisciplinary consortium working on various aspects of policy making process enriched with workflow technologies, mobile technologies, semantic technologies, privacy preserving data management and sentiment analysis. As the list of publications shows UBIPOL dissemination activities can make a significant impact in research in the fields of policy making process, workflow technologies for Policy Making, e-Government through ubiquitous participation, privacy preserving reported issue retrieval, privacy preserving publication of opinion polls, sentiment analysis and opinion mining. We also developed a freely available software tool directly targeting researchers as well. A Demo of this tool was presented in the European Conference on Machine Learning and can be used for developing opinion mining lexicon and ontologies.

UbiPOL also achieved local impact in Turkey, since some of the publications are related to e-Government in Turkey. Through some of our publications we tried to disseminate the general UbiPOL idea and infrastructure, while others are related to specific aspects of UbiPOL, such as sentiment analysis or workflow management.

The research activities of UbiPOL will continue beyond the project completion. We are extending some of the conference publications to be sent to international journals and continuing our research efforts into new directions.