

Final Report for Period: 11/2006 - 10/2007
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Organization: U of Massachusetts Amherst
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Organizational Partners

National Mediation Board

NMB is an enthusiastic partner in this project. NMB makes generous amounts of the time of key senior staff members available, and NMB provided significant financial support to the project during this past year. NMB proudly tells the members of its community that it is pleased to be a partner with NSF in supporting this project. Most significantly, NMB has been using the prototype systems that this project has been producing in its work with parties in the airline and railroad industries.

Activities and Findings

Research and Education Activities:

This project entailed working with our partners at the National Mediation Board (NMB) to define precisely the processes that NMB uses to guide mediation efforts. The goal of this was to gain understandings of how best to realize Online Dispute Resolution (ODR) technologies. In our work we used our Little-JIL process definition language to define key parts of the NMB mediation process. We also produced an early prototype system, called Storm-1, that presents a proposed user interface to ODR systems to prospective users of our eventual system. This prototype was, during the past years, used to project to NMB and others a sense of how a process such as the ones we defined in Little-JIL might look to participants whose mediation efforts are being guided by the processes we have defined, and will define in the future. The Storm-1 prototype was demonstrated by NMB at a number of public meetings, and was used very carefully in real negotiations in order to gain insights and provide feedback about the requirements for a more complete and more efficacious next version of this support technology. This work built towards the development of an ODR system to be driven directly by Little-JIL process definitions, and that will guide the efforts of mediators. During the course of the project we elicited details of specific ODR processes currently used by NMB mediators, and captured parts of these processes in rigorous definitions using our Little-JIL process definition language. We also designed a middleware system that will in subsequent work drive such Little-JIL definitions and use them to automatically drive the mediator's and the participants' interface to the ODR systems that are the automations of the processes that we have defined. A first prototype implementation of this middleware system has been completed. As the project ends we are poised to integrate this user interface management system with some actual Little-JIL definitions of NMB ODR processes. We also designed vehicles for measuring and evaluating the ODR systems that we will define and implement in subsequent work. These vehicles will support informal laboratory experiments at first, and will then be used to help evaluate our systems in prototype use by the NMB.

Findings:

Our findings include the following:

1. Little-JIL seems to be quite adept at defining the ODR processes we have studied

2. NMB personnel seem to be quite comfortable in using Little-JIL as a vehicle for understanding their processes, and participating in their precise definition
3. The prototype user interface tool seems to be suggesting an ODR user interaction mode that seems quite comfortable for prospective users. But it is also proving to be useful in helping prospective users to provide sharper feedback on desiderata.
4. The details of the user interface are quite important and deserve a considerable amount of attention.
5. A device for automating the creation and deployment of flexible user interfaces seems critically important. This device should be driven, to the extent possible, by the actual process definition.
6. Although it has been represented that there is one process that NMB uses, it is now clear that there are many variants of this process. In particular, the process used in face-to-face mediation is quite different from the ODR version.

Training and Development:

Students working on this project have developed important skills in precise process definition. The use of Little-JIL has helped students to understand the difficulties, and the value, in performing precise process definition. In addition the students have developed strong skills in dealing with the Little-JIL language itself. This, in turn, has helped them to be more effective as evaluators of programming languages in general. Two students were also trained in the development of flexible user interfaces. This training also took the form of the development and preliminary evaluation of a flexible user interface generation system, driven by process definitions. All of the workers on this project have also gained very useful teaching experience by working to communicate clearly to NMB personnel understandings of processes, process definitions, ODR concepts, and the specifics of various ODR approaches.

Outreach Activities:

In working with the National Mediation Board, we projected to the labor-management mediation community a sense that the rigor of science can help in that particular domain. NMB had very little previous contact with the scientific research community, and seems very pleased to have been shown ways in which the rigor of science and scientific thinking can help them with some of their most challenging and important problems. As we continued to develop our ODR technologies, the technologies increasingly came into broader contact with organized labor, and representatives of the railroad and airline industries. Major presentations were made to the US Government Interagency Working Group on Alternative Dispute Resolution and the American Bar Association. Talks were given at major International Meetings on Software Engineering, e-society and Online Dispute Resolution, as well as, United Nations Forums. Tutorials were given at the Association for Conflict Resolution Annual Meeting and at Cyberweek, the Online Conference of the Center for Information Technology and Dispute Resolution. Our partner, NMB, was approached by other Federal Agencies on uses of ODR including the Department of Agriculture, the Navy, The Department of Justice and National Institutes of Health, as well as, the United Kingdom's Queens Solicitor General.

Journal Publications

Leon J. Osterweil, Charles M. Schweik, Norman K. Sondheimer, Craig W. Thomas, "Analyzing processes for E-Government Application Development: The Emergence of Process Definition Languages", *Journal of E-Government*, p. 63, vol. 1, (2005). Published,

Ethan Katsh, "Online Dispute Resolution: Some Implications for the Emergence of Law in Cyberspace (<http://www.lex-electronica.org/articles/v10-3/katsh.pdf>)", *LexElectronica*, p. Online, vol. 10, (2006). Published,

Ethan Katsh, "Dispute Resolution Without Borders: Some Implications for the Emergence of Law in Cyberspace (http://www.firstmonday.org/issues/issue11_2/katsh/index.html)", *First Monday*, p. Online, vol. 11, (2006). Published,

Alan Gaitenby, "The Fourth Party Rises: Evolving Environments Of Online Dispute Resolution", The University Of Toledo Law Review, p. 371, vol. 38, (2006). Published,

Daniel Rainey, "Keynote: SYMPOSIUM ON ENHANCING WORLDWIDE UNDERSTANDING THROUGH ONLINE DISPUTE RESOLUTION", THE UNIVERSITY OF TOLEDO LAW REVIEW, p. 11, vol. 38, (2006). Published,

Ethan Katsh, Leah Wing, "Ten Years of Online Dispute Resolution (ODR): Looking at the Past and Constructing the Future", THE UNIVERSITY OF TOLEDO LAW REVIEW, p. 19, vol. 38, (2006). Published,

Ethan Katsh, "The Nuts and Bolts of ODR", GP SOLO, p. <http://ww>, vol. 23, (2006). Published,

Books or Other One-time Publications

Ethan Katsh, "Online Dispute Resolution", (2005). Book Chapter, Published Editor(s): Bordone and Moffitt Collection: Handbook of Dispute Resolution Bibliography: San Francisco: Jossey-Bass, 2005, pp. 425 - 437.

Ethan Katsh, Leon Osterweil, Norman Sondheimer, Daniel Rainey, "Early Lessons from the Application of Process Technology to Online Grievance Mediation", (2005). Conference series, Published Collection: Proceedings of dg.o 2005, The 2005 National Conference on Digital Government Research, Atlanta, Georgia, May 2005 Bibliography: Proceedings of dg.o 2005, The 2005 National Conference on Digital Government Research, Atlanta, Georgia, May 2005

Lori Clarke, Alan Gaitenby, Daniel Gyllstrom, Ethan Katsh, Matthew Marzilli, Leon J. Osterweil, Daniel Rainey, Norman K. Sondheimer, Leah Wing, Alexander Wise, "Realizing Online Dispute Resolution in a Federal Agency through Process-Based Methods", (2006). Conference Proceedings, Published Collection: DG.o2006: The National Conference on Digital Government Research Bibliography: DG.o2006: The National Conference on Digital Government Research, San Diego, CA, May 2006

Ethan Katsh, Leon J. Osterweil, Daniel Rainey, Norman K. Sondheimer, "Experimental Application of Process Technology to the Creation and Adoption of Online Dispute Resolution", (2006). Conference Proceedings, Published Collection: DG o2006: The National Conference on Digital Government Research Bibliography: DG o2006: The National Conference on Digital Government Research, San Diego, CA
Leon J. Osterweil, Norman K. Sondheimer, Lori A. Clarke, Ethan Katsh, Daniel Rainey, "Using Process Definitions to Facilitate the Specification of Requirements", (2006). Technical Report, Published Collection: Technical Report, Dept. of Computer Science, University of Massachusetts, Amherst, MA Bibliography: UM-CS-2006-11

Leon J. Osterweil, "Ubiquitous Process Engineering: Applying Software Process Technology to Other Domains", (2006). Conference Proceedings, Published
Editor(s): Qing Wang, Dietmar Pfahl, David Raffo, and Paul Wernick
Collection: International Software Workshop and International Workshop on Software Process Simulation and Modeling, 2006
Bibliography: Lecture Notes in Computer Science, LNCS 3966, Springer Verlag, Heidelberg, Germany 2006, pp. 38-46.

Daniel Rainey, Norman Sondheimer, "E-Government and Online Dispute Resolution", (2006). Conference Keynote Presentation, Published Collection: e-Society 2006 Conference
Bibliography: e-Society 2006 Conference, Dublin, Ireland

Lori Clarke, Alan Gaitenby, Ethan Katsh, Matthew Marzilli, Leon Osterweil, Daniel Rainey, Borislava Simidchieva, Norman Sondheimer, Leah Wing, Alexander Wise, "Using Process Definitions to Drive User Interactions with Digital Government Systems", (2007). Proceedings, Published
Collection: Proceedings of the 8th annual international conference on Digital government research: bridging disciplines & domains
Bibliography: Philadelphia, PA, 310-311

Ethan Katsh, Alan Gaitenby, Norman Sondheimer, "Law and governance and virtual worlds", (2007). Proceedings, Published Collection: Proceedings of the 8th annual international conference on Digital government research: bridging disciplines & domains dg.o '07
Bibliography: Philadelphia, PA

Leon J. Osterweil, "Ubiquitous Process Engineering: Applying Software Process Technology to Other Domains", (2006). Proceedings, Published Collection: International Software Process Workshop and International Workshop on Software Process Simulation and Modeling, SPW/ProSim
2006, Shanghai, China, May 20-21, 2006. Proceedings
Bibliography: Springer Berlin / Heidelberg

Borislava I. Simidchieva, Lori A. Clarke, Leon J. Osterweil, "Representing Process Variation with a Process Family", (2007). Proceedings, Published Collection: Proceedings Software Process Dynamics and Agility International Conference on Software Process, ICSP 2007, Minneapolis, MN, USA, May 19-20, 2007.
Bibliography: Springer Berlin / Heidelberg

Lori A. Clarke, Alan Gaitenby, Daniel Gyllstrom, Ethan Katsh, Matthew Marzilli, Leon J. Osterweil, Norman K. Sondheimer, Leah Wing, Alexander E. Wise, Daniel Rainey, "A process-driven tool to support online dispute resolution", (2006). Proceedings, Published Collection: Proceedings of the 2006 international conference on Digital government research Bibliography: San Diego, CA, 356-357

Web/Internet Site

URL(s):

http://www.odr.info/nmb/NSF_NMB_Home.htm

Description:

The Web site contains information about research connected to the grant.

Other Specific Products

Product Type: Software (or netware) Product Description:

We are developing families of ODR process definitions. These definitions are intended to capture in precise detail the specifics of various processes (and variants on them) that are used as a part of NMB's ODR process. We are developing a prototype system whose purpose will be to indicate the sorts of user interfaces that are desired and needed in successful ODR systems.

Sharing Information:

We will make our ODR processes available to others by publishing papers on them, and by placing the most successful final versions on our web sites. We expect to make our user interface prototype generally available. During the next year we expect that we will have produced a prototype version of a process-driven ODR system. After evaluation of different versions of process-driven ODR systems, we will make at least one of the most successful versions available through online distribution or some other such channel.

Product Type: Software (or netware) Product Description:

Storm: This is a prototype system that is designed to present example user interfaces to potential participants of Online Dispute Resolution systems. Our project will support ODR with processes that define the specific approach to be taken in an ODR session. The Storm prototype presents participants with a view of how that process-driven ODR session will look and feel. The goal of this is to determine which user interfaces are most likely to be accepted by the participants, and how process definitions might have to be adapted to gain user acceptance and support.

Sharing Information:

Storm has been transitioned to the National Mediation Board, where it has been used in a number of training sessions and a small number of actual mediation sessions. NMB has presented Storm to a number of meetings in the form of demonstrations. Wider distribution of Storm is not contemplated at present, as a successor technology is expected in Fall of 2007.

Contributions within Discipline:

The project has contributed to a number of important disciplinary fields. The contributions to computer science and software engineering are quite important. From our work in precisely defining ODR processes we gained a better understanding of what process language features are needed in order to support precise process definition. Our work also helped us to understand how to tightly link process definitions to the user interfaces needed in order to effectively involve humans in these processes. This is important research in the area of software process. Our work suggested that it is important to study process families. Our initial expectation was that there was a single process for ODR that we should be seeking to define and study. What emerged from the work on this project is a realization that there is in fact a family of such processes that are variants, adaptations, and modifications of each other. We now must understand whether it is more accurate and effective to consider that there is indeed one process, with defined modifications, or if it is more productive to consider that there is a family of such processes, in which case defining clearly the relations among the family members becomes important. This new focus on understanding

process families seems to be an important contribution to process research, especially because it strongly suggests that other application domains also consist of families of processes where it previously had seemed that there was only one process. The project also made important contributions to the field of Online Dispute Resolution (ODR). The processes that we defined require precision and details that elaborate upon the current, more general, understandings of these processes. As we were able in the future to use our precise definitions to directly drive these ODR processes we will be able to observe the reactions and experiences of users, and that will provide the field of ODR with specific insights into the efficacy of various variants on basic ODR approaches. In addition, it is not yet widely understood how computers connected to a network might supplement the expertise of a human third party or add quality and value to the dispute resolution process in ways that are not possible in traditional face to face processes. Our work is providing a strong basis for exploring that space.

Contributions to Other Disciplines:

Our process definition and analysis technologies have clear applicability to many diverse domains of research and practice, including health care, internet commerce, government, and scientific data processing--just name a few. Thus the insights into precise specification of processes that this project has developed will have immediate and clear relevance to these other process-centered domains. Indeed, Little-JIL process language insights are already being exploited in our other work on medical process improvement, election process improvement, and other such domains.

Contributions to Human Resource Development:

We trained a number of students in process technology, and also in ODR. These students will become an increasingly important and useful human resource. We expect that, in time, they will mature to the point where they will be able to train others in these skills.

Contributions to Resources for Research and Education:

We believe that the ODR processes and systems that we developed will become resources for courses in dispute resolution and ODR, both here at UMass, and at other universities, and indeed in institutions beyond higher education that are charged with the resolution of disputes.

Contributions Beyond Science and Engineering:

We expect that the ODR tools we developed will lead to expedited and more successful resolution of disputes. In the coming years we expect that our work will be incorporated into the resolution of actual disputes mediated by the NMB. We expect that our technology will result in speedier and more satisfactory resolution of labor-management disputes in the airline and railroad industries. In the future, we anticipate that our work will find increasing use and application in other areas where disputes arise and need resolution. One of our project members has recently participated in dispute resolution in Northern Ireland. We expect to seek ways in which our research might find some application in the resolution of the sorts of disputes that exist in Northern Ireland. Our project has also help create a new online course on Online Dispute regularly available from the University of Massachusetts Division of Continuing Education. The course provides a comprehensive overview of the modern practice of ODR. Participants learn about the history and development of ODR, the current state of the field, and advantages and disadvantages of using online techniques to resolve disputes. It explores several types of ODR platforms in use around the world, including automated negotiation, solution databases, and virtual meeting rooms. Participants also get a chance to try out the tools used to practice ODR, giving them a chance to confront common practice challenges and overcome frequently-encountered difficulties. The course includes several role-plays, and each participant will have a chance to participate in these simulations as both a third-party neutral and a disputant. Students are also afforded a unique opportunity to 'meet' with a variety of guest lecturers who come from all over the globe, virtually of course, to deliver content and experiences to our students through online technology. Guests have historically been leading entrepreneurs, scholars, and practitioners of ODR and related activities.