Annual Report for Period: 11/2005 - 11/2006   **Submitted on:** 09/22/2006

Principal Investigator: Osterweil, Leon J.   **Award ID:** 0429297

Organization: U of Massachusetts Amherst

Title:
Process Technology for Achieving Government Online Dispute Resolution

Project Participants

Senior Personnel

Name: Osterweil, Leon
Worked for more than 160 Hours: Yes
Contribution to Project:

Name: Katsh, Ethan
Worked for more than 160 Hours: Yes
Contribution to Project:

Name: Sondheimer, Norman
Worked for more than 160 Hours: Yes
Contribution to Project:

Name: Miller, Jane
Worked for more than 160 Hours: No
Contribution to Project:

Name: Clarke, Lori
Worked for more than 160 Hours: No
Contribution to Project:

Name: Wing, A
Worked for more than 160 Hours: No
Contribution to Project:

Name: Gaitenby, Alan
Worked for more than 160 Hours: No
Contribution to Project:

Name: Peters, Linda
Worked for more than 160 Hours: No
Contribution to Project:

Post-doc

Graduate Student

Name: Farmer, Kevin
Worked for more than 160 Hours: Yes
Contribution to Project:

Name: Raunak, Muhammad

Worked for more than 160 Hours: Yes
Contribution to Project:

Name: Tan, Jianban
Worked for more than 160 Hours: Yes
Contribution to Project:

Name: Gylllstrom, Daniel
Worked for more than 160 Hours: Yes
Contribution to Project:

Name: Chen, Bin
Worked for more than 160 Hours: Yes
Contribution to Project:

Name: Cobleigh, Jamieson
Worked for more than 160 Hours: Yes
Contribution to Project:

Name: Hawkes, Bradley
Worked for more than 160 Hours: Yes
Contribution to Project:

Undergraduate Student
Name: Marzilli, Matthew
Worked for more than 160 Hours: Yes
Contribution to Project:

Technician, Programmer
Name: Wise, Alexander
Worked for more than 160 Hours: Yes
Contribution to Project:

Other Participant

Research Experience for Undergraduates

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. NMB also provided about $60K in 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. NMB has found the prototypes to be of considerable value. Their use of these

systems has added significantly to our understanding of the underlying research issues, and provided important new direction for the research.

Other Collaborators or Contacts

Harry Hoaglander, Member, National Mediation Board
Daniel Rainey, Director Alternative Dispute Resolution, NMB
Linda Puchala, Senior Mediator, NMB
Rachel Barbour, Conflict Resolution Specialist, NMB
Michael Wolf, Counsel, NMB
Dennis Hedges, Mediator, NMB
Fred Lief, Mediator, NMB

Activities and Findings

Research and Education Activities:
We have been working with our partners at the National Mediation Board (NMB) to define precisely the processes that they use to guide mediation efforts. The goal of this is to gain understandings of how best to realize Online Dispute Resolution (ODR) technologies. In our early work we have used our Little-JIL process definition language to define key parts of the NMB mediation process. We have also produced an early prototype system that presents a proposed user interface to ODR systems to prospective users of our eventual system. This prototype has, during the past year, been used to project to NMB and others a sense of how a process such as the ones we are defining in Little-JIL might look to participants whose mediation efforts are being guided by the processes we are defining. The prototype has been demonstrated by NMB at a number of public meetings, and has been 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 is building towards the development of an ODR system that will be driven directly by Little-JIL process definitions, and that will guide the efforts of mediators. During the past year we have elicited details of specific ODR processes currently used by NMB mediators, and are planning to capture these processes in rigorous definitions using our Little-JIL process definition language. We have also designed a middleware system that should be capable of taking such Little-JIL definitions and using them to automatically drive the mediator's and the participants' interface to the ODR systems that are the automations of the processes that we are defining. We expect to complete the implementation of this middleware system during the coming year. We have also started to design vehicles for measuring and evaluating the ODR systems that we will be defining and implementing. 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 to date are still quite preliminary. But we have so far observed:

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 defintion. 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.

One student is being trained in the development of flexible user interfaces. This training is currently taking the form of the development 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 are projecting to the labor-management mediation community a sense that the rigor of science can help in that particular domain. NMB has had very little contact with the scientific research community, and seems very pleased to be able to see ways in which the rigor of science and scientific thinking can help them with some of their most challenging and important problems.

As we continue to develop our ODR technologies, they will increasingly come into broader contact with organized labor, and representatives of the railroad and airline industries. Major presentations have already been made to the US Government Interagency Working Group on Alternative Dispute Resolution and the American Bar Association. Talks have been given at major International Meetings on Software Engineering, e-society and Online Dispute Resolution, as well as, United Nation Forums. Tutorials have been 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, has been 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 Emergency 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

Ethan Katsh and Leah Wing, "Ten Years of Online Dispute Resolution: Looking at the Past and Constructing the Future", University of Toledo Law Review, p. Online, vol. , (2006). Accepted

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

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 Strom 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 2006.

Contributions

Contributions within Discipline:

The project's work is contributing 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 are gaining a better understanding of what process language features are needed in order to support precise process definition. Our work is also helping 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 is now suggesting 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 is now emerging is a realization that there is in fact a family of such processes that are variants, adaptations, and modifications of each other. We are now seeking to 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. We believe that other application domains also consist of families of processes where it previously had seemed that there was only one process.

The project is also making important contributions to the field of Online Dispute Resolution (ODR). The processes that we are defining require precision and details that are providing elaboration to current, more general, understandings of these processes. As we are able 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 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 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 that this project will develop into precise specification of processes will have immediate and clear relevance to these other process-centered domains. Indeed, Little-JIL process language insights are being exploited in our other work on medical process improvement, election process improvement, and other such domains.

Contributions to Human Resource Development:

We are starting to train 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 are being 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 are developing will lead to expedited and more successful resolution of disputes. In the coming year we expect that our work will be incorporated into acutal 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 later years, 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.

Special Requirements

Special reporting requirements: None
Change in Objectives or Scope: None

Unobligated funds: $ 0.00

Animal, Human Subjects, Biohazards:

We have decided that early prototype capabilities should be evaluated through their use by UMass students in dispute resolution courses. Thus such students have used some of our early prototype capabilities. We will most likely continue to have UMass students try our technologies early in their development. This will supplement and augment the use of NMB personnel in our evaluations of our technologies.

We believe that all necessary approvals for these uses of humans in evaluation have been sought and obtained.

Categories for which nothing is reported: