

A Software Infrastructure for Government Regulation Analysis and Compliance Assistance

Gloria T. Lau¹, Shawn Kerrigan¹, Haoyi Wang¹, Kincho H. Law¹, Gio Wiederhold²
Department of Civil & Environmental Engineering¹, Computer Science Department²
Stanford University, Stanford, CA 94305

glau@stanford.edu, kerrigan@stanfordalumni.org, haoyiw@stanford.edu,
law@stanford.edu, gio@cs.stanford.edu
<http://eig.stanford.edu/regnet>

Government regulations are voluminous, heavily cross-referenced and often ambiguous. To cope with the complexity and diversity of regulations, we developed a formal information infrastructure for regulation management, analysis and compliance assistance. In this system demonstration, several aspects of the project are shown – a regulatory document repository, a regulation assistance system and an e-rulemaking analysis prototype. Together, our system aids in *understanding* and compliance of government regulations and related documents. In order to develop a prototype system, we focus on accessibility and environmental regulations. The compliance assistance system is illustrated in the domain of used oil management, while the e-rulemaking analysis is performed on accessible public rights-of-way rules.

An XML regulatory repository is developed, which includes Federal, State and European regulations as well as supplementary documents in the domains of accessibility and environmental standards. As shown in Fig. 1, this software demonstration illustrates a regulation assistance system (RAS) which built upon an XML framework that includes a regulatory repository. The RAS makes use of the extracted feature metadata, such as concepts, definitions and references, from the repository. A provision is rendered in a web browser in Fig. 1, with useful features highlighted. For instance, users can browse through referenced sections by following hyperlinks, search the repository with suggested concepts that are identified in the current provision, as well as look up definitions of specific terms. The repository also contains related information, such as letters of interpretation and guidance documents, that can be accessed directly from the RAS system (see Fig. 2).



Fig. 1: Usages of extracted features

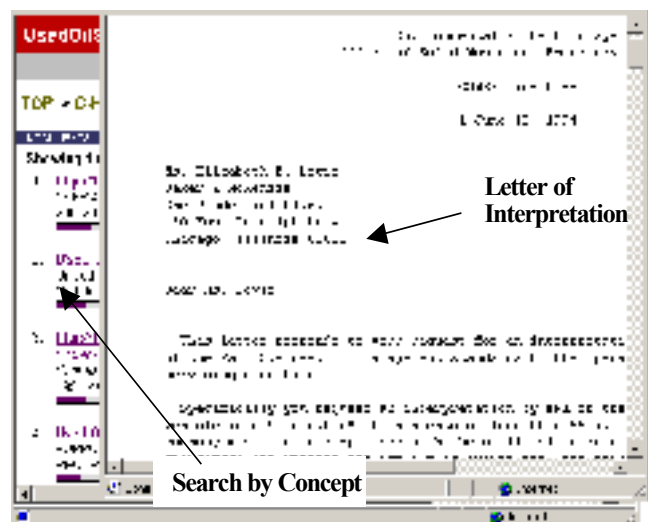


Fig. 2: Retrieval of supplementary documents

The regulation assistance system (RAS) also provides compliance guidance through a logic-based framework. A web interface, shown in Fig. 3, asks users questions based on logic metadata embedded in the provision. Users may select a response from a menu of possible answers, including “Yes”, “No” and

“I don’t know” options. The system then checks user answers against the regulation provisions, and alerts users of detected conflicts or otherwise compliance with the regulation. A summary of the question-and-answer history as well as the compliance results is shown at the end of a compliance-checking session. Referenced sections are checked for compliance as well for a complete analysis; in short, our system guides users through all relevant provisions based on a logic-enhanced XML framework.

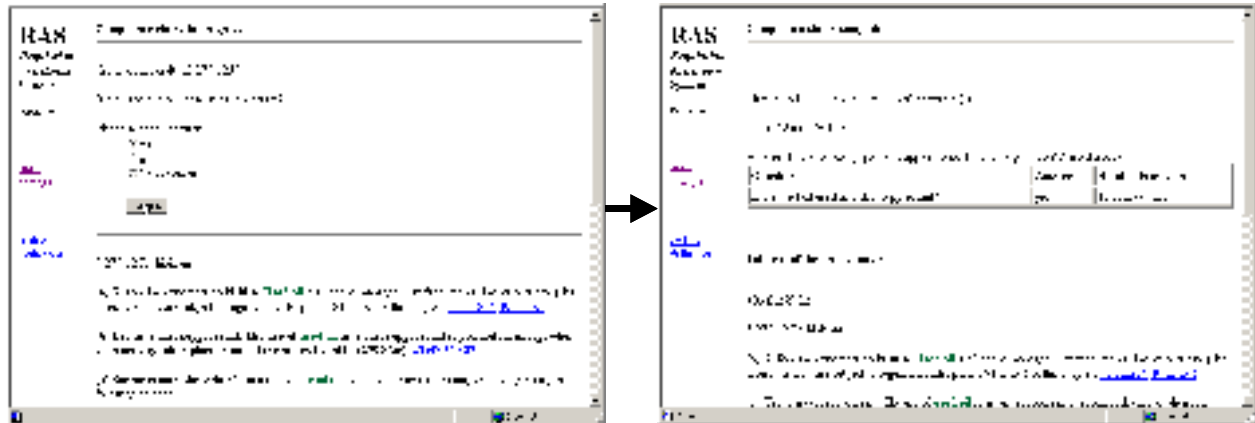


Fig. 3: Example compliance-checking session

Finally, this system demonstration includes an e-rulemaking analysis prototype, which is built upon the XML repository framework, to help understanding and comparisons of drafted rules and its associated public comments. As shown in Fig. 4, a newly drafted regulation released by the Access Board is shown in its natural tree structure, with nodes representing provisions in the draft. Our similarity analysis system compared the draft with its associated public comments, and identified the most related public comments with each provision in the draft. Users can click on nodes in the regulation tree for provision content as well as the retrieved public comments. With the large amount of public comments generated per draft in the e-rulemaking process, this system can potentially assist rulemakers to retrieve the most relevant public comments related to a drafted rule.

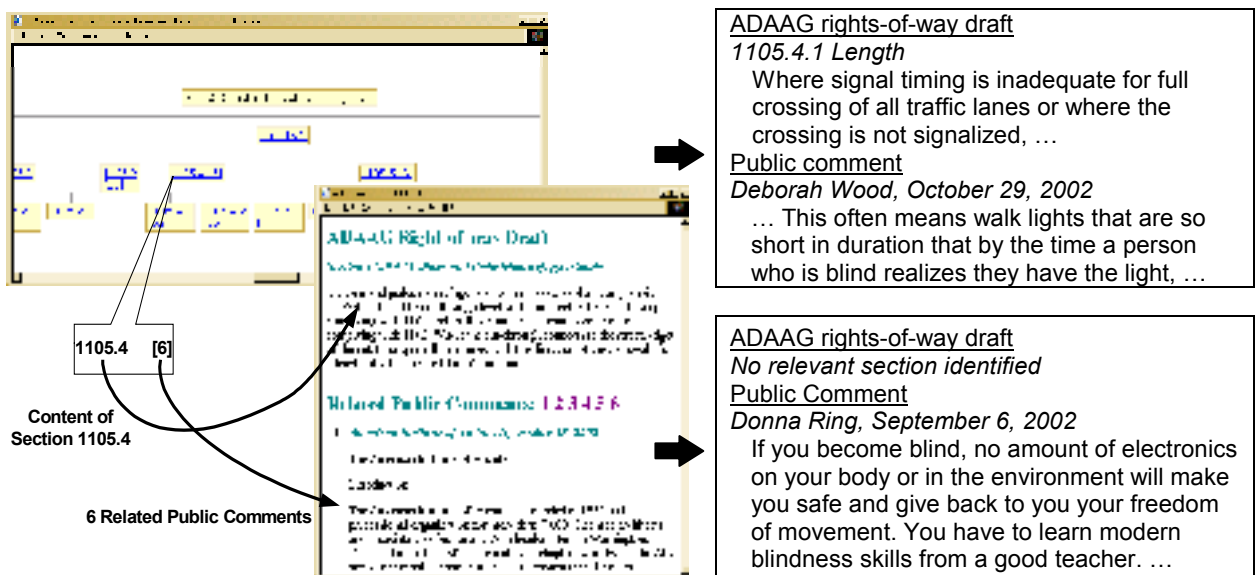


Fig. 4: Application of similarity analysis on e-rulemaking