Prototyping Fusion Center Information Sharing; Implementing Policy Reasoning Over Cross-Jurisdictional Data Transactions Occurring in a Decentralized Environment

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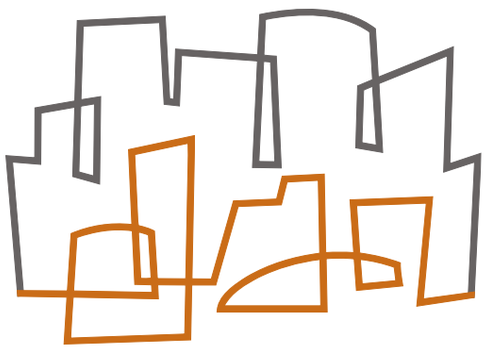


MIT COMPUTER SCIENCE AND ARTIFICIAL INTELLIGENCE LABORATORY

Decentralized Information Group

The Challenge of Accountable Systems

Organizations have obligations regarding the collection, use, and sharing of information.

How can we ensure these obligations are met?

Our Prototype Solution

Automatically produce a justification that explains compliance or non-compliance for each transaction

Implementation Outline

- Encode laws into a machine-usable format
- Ensure that necessary databases are accessible
- Annotate each data-sharing event with metadata
- Enable a reasoner to process each event
- Display the justification in a user-friendly format

Encoding Laws

A criminal justice agency may request this information from the Central Repository or another criminal justice agency only if it has a need for the information:

(1) In the performance of its function as a criminal justice agency; or

(2) For the purpose of hiring or retaining its own employees and agents.

```
:MD_12_15_01_11_Ad1 a air:Belief-
rule;
  air:if {
    :R mdccl:purpose
mdccl:Performance_of_function.
  };
  air:then [
    air:description ( :INFO " is
required in the performance of
" :R "'s function as a criminal
justice agency.");
    air:rule :MD_12_15_01_11_B1
  ];
  air:else
[ air:rule :MD_12_15_01_11_Ad2 ].
```

User Profiles

Subject to the provisions of Regulation .12B, the Central Repository and other criminal justice agencies shall disseminate CHRI, be it conviction or nonconviction criminal history record information, to **a criminal justice agency** upon a request made in accordance with applicable regulations adopted by the Secretary.

```
<> dc:title "Maury Copp's User Profile";
  a foaf:Person;
  foaf:organization_type "Criminal_Justice_Agency";
```

Auxiliary Records

The board shall certify those agencies and individuals requesting access to criminal offender record information that qualify for such access under clauses (a) or (b) of this section, and shall specify for each such agency or individual certified, the extent of its access.

```
# Board Certified Organizations

:MauryCopp a ma:Board_Certified_Individual.
```

Encoding Transactions

dice.csail.mit.edu/MD/

Please enter the sender's URL:

Maury Copp <expandmcopp@bpd.md.US.gov>

Please enter the data's URL, or select from the files below:

http://dig.csail.mit.edu/2010/DHS-fusion/MD/documents/

- Fusion
  - Copp
    - Responses
      - EFudd
      - ACapone
      - **ToMia**
      - ToMiaCore
  - Received

Please enter the recipient's URL:

Mia Analysa <mia@msp.mass.gov>

Please enter a policy's URL:

http://dig.csail.mit.edu/2010/DHS-fusion/MD/rules/MdCo

☑ Display results using the Tabulator Firefox browser extension.
This is the recommended way to display results, but can be disabled if you are not able to install Tabulator.

From: Maury Copp <expandmcopp@bpd.md.US.gov>
To: Mia Analysa <mia@msp.mass.gov>
File: ToMia
Policy: http://dig.csail.mit.edu/2010/DHS-fusion/MD/rules/MdCodeComLaw_12_15_01_11.n3

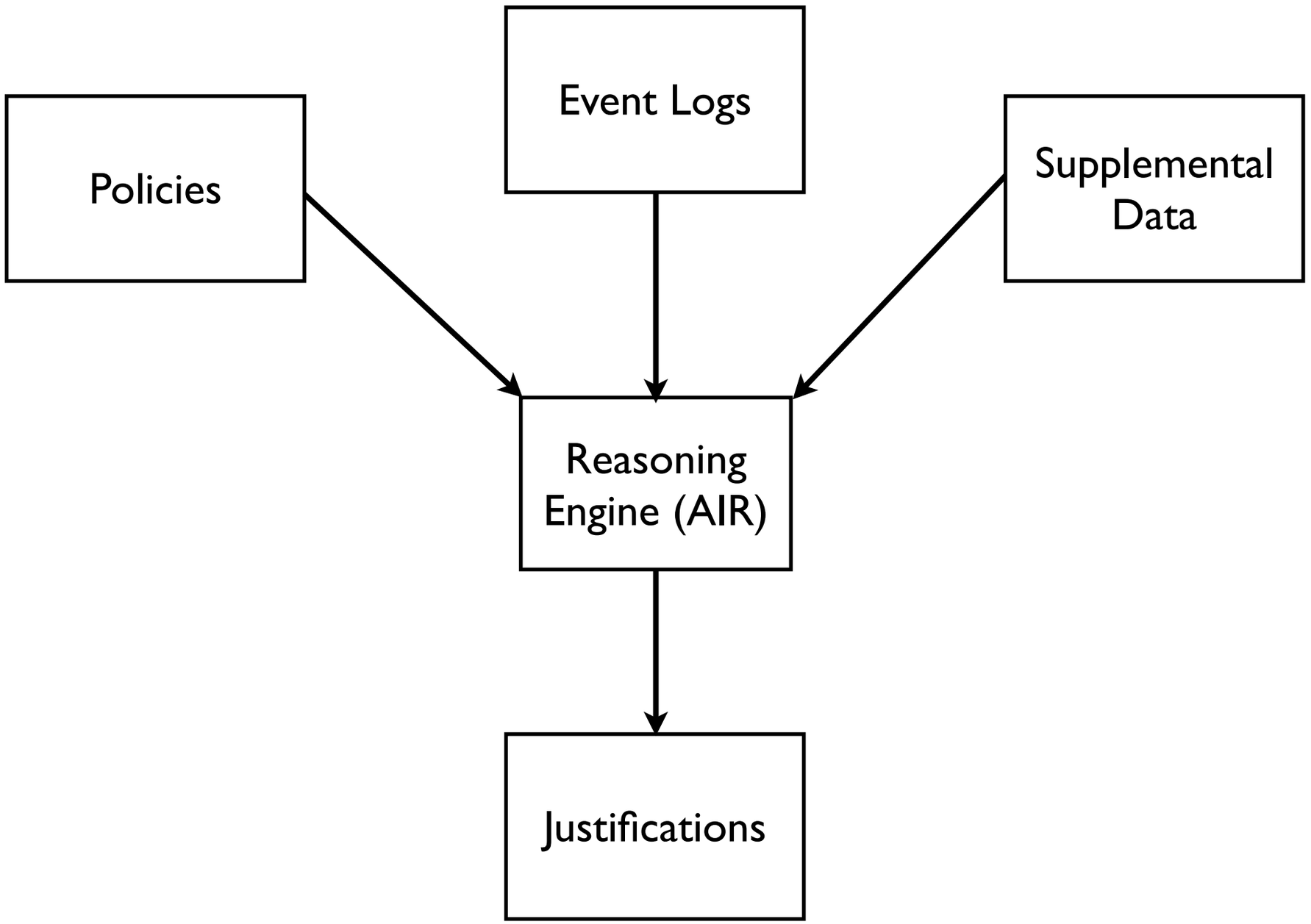
Submit

Transaction sender: Maury Copp
Transaction receiver: Mia Analysa
Transaction file: Fake_MD_Response.pdf

- [ ] Does Mia Analysa need Fake_MD_Response.pdf in the performance of its function as a criminal justice agency?
- [ ] Does Mia Analysa need Fake_MD_Response.pdf for the purpose of hiring or retaining its own employees and agents?
- [ ] Has Mia Analysa's identity been verified by Maury Copp?
- [ ] Has Mia Analysa demonstrated to Maury Copp that delay in receiving Fake_MD_Response.pdf will unduly impede necessary action by Mia Analysa?
- [ ] Has Mia Analysa demonstrated to Maury Copp that delay in receiving Fake_MD_Response.pdf will violate or materially impair a substantive right of the person about whom Fake_MD_Response.pdf is needed?

Submit

Reasoner


Policies
Event Logs
Supplemental Data
Reasoning Engine (AIR)
Justifications

Displaying Successful Justifications

Analysis:

- Fake_MD_Response.pdf has been verified by Central_Repository to be complete, accurate, and current.
- Fake_MD_Response.pdf is required for Mia Analysa to hire or retain employees and agents.
- Mia Analysa is a Maryland Criminal Justice Agency . Transaction is a dissemination request from Maury Copp to Mia Analysa .
- If Transaction is compliant, it is compliant only if Transaction is made in accordance with applicable regulations adopted by Secretary .
- Mia Analysa demonstrated to Maury Copp that a delay in the receipt of Fake_MD_Response.pdf will unduly impede necessary action by Mia Analysa .

Conclusion:

The transaction - Transaction is compliant with MGL_12_15_01_11

Displaying Failed Justifications

Analysis:

- If Transaction is compliant, it is compliant only if Transaction is made in accordance with applicable regulations adopted by Secretary .
- Mia Analysa is a Maryland Criminal Justice Agency . Transaction is a dissemination request from Maury Copp to Mia Analysa .
- Maury Copp cannot disseminate Fake_MD_Response.pdf to Mia Analysa because it is neither required for its function as a criminal justice agency or for the purpose of hiring or retraining employees and agents.

Conclusion:

The transaction - Transaction is non-compliant with MD_12_15_01_11_Ab2

Additional Benefits

- Experiment on old events with new policies
- Run hypothetical transactions against many policies
- Profile the usage of existing policies

Challenges

- Vocabularies between organizations may not match up
- Translations of laws may differ

Contact

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