

RDF Exercises around TAMI

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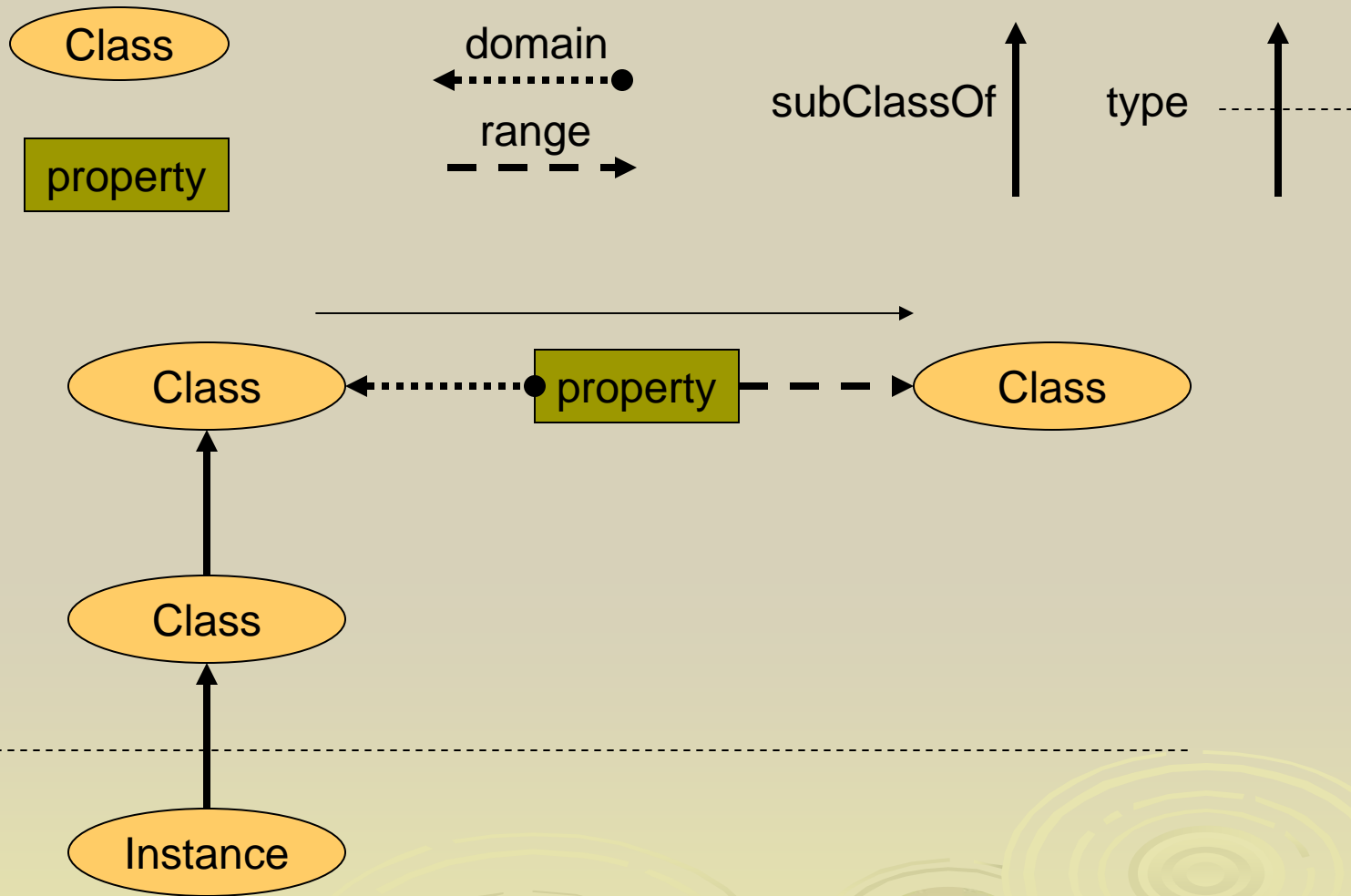
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Contents

- 0. Graphical notational conventions
- 1. A general RDF vocabulary (graphs and N3)
- 2. A particular scenario (“the” example)
- 3. Some general rules
- 4. Some particular inferences

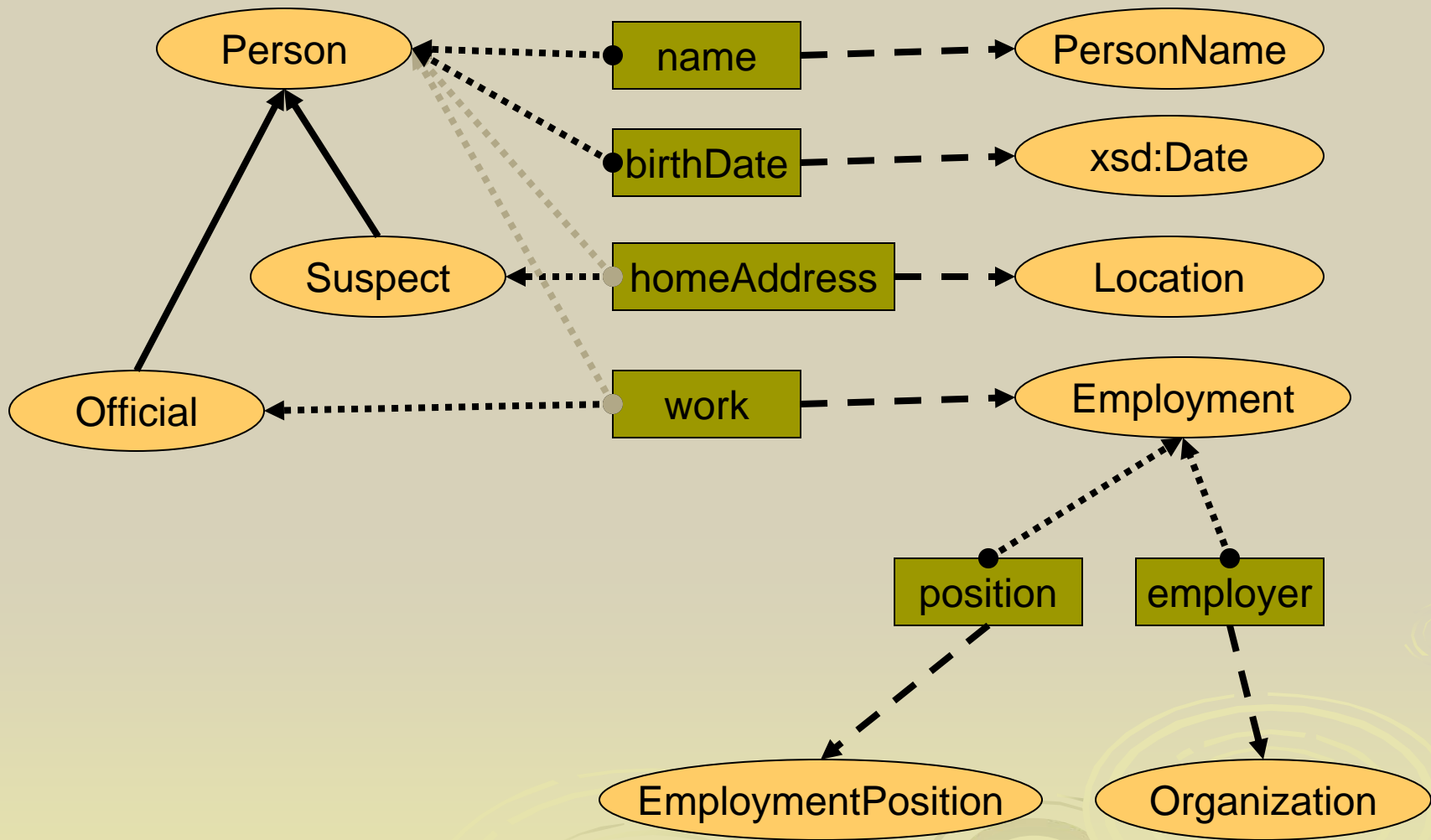
0. Notation



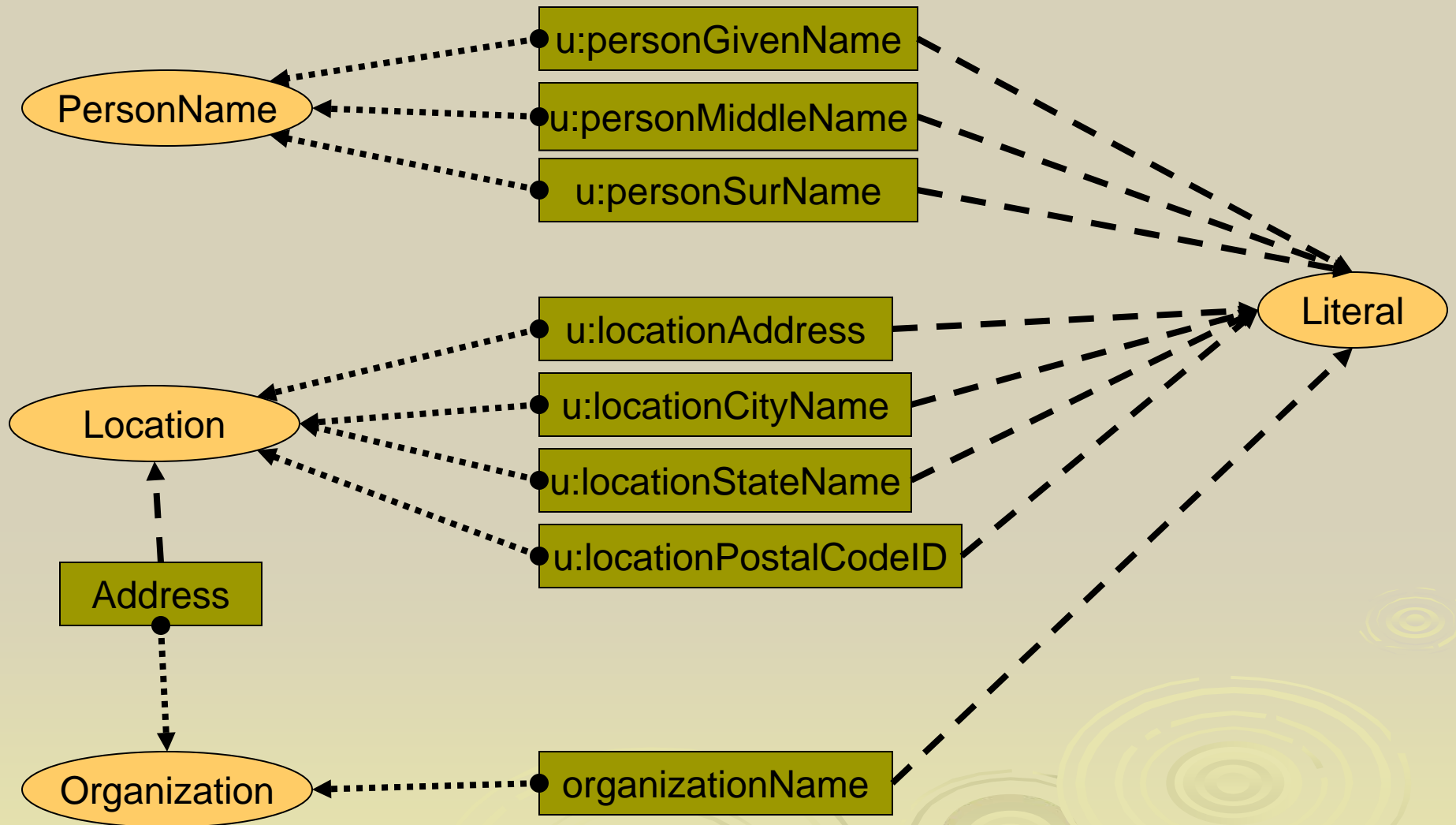
1. An RDF Vocabulary

- The translation to N3 is in the notes part.
- Main classes:
 - Person
 - PersonName, Location, Organization
 - DataRecord
 - Database, Flight, File
 - Event
 - Search
 - Transfer
 - Assignment
 - CaseOpening
 - WarrantIssue

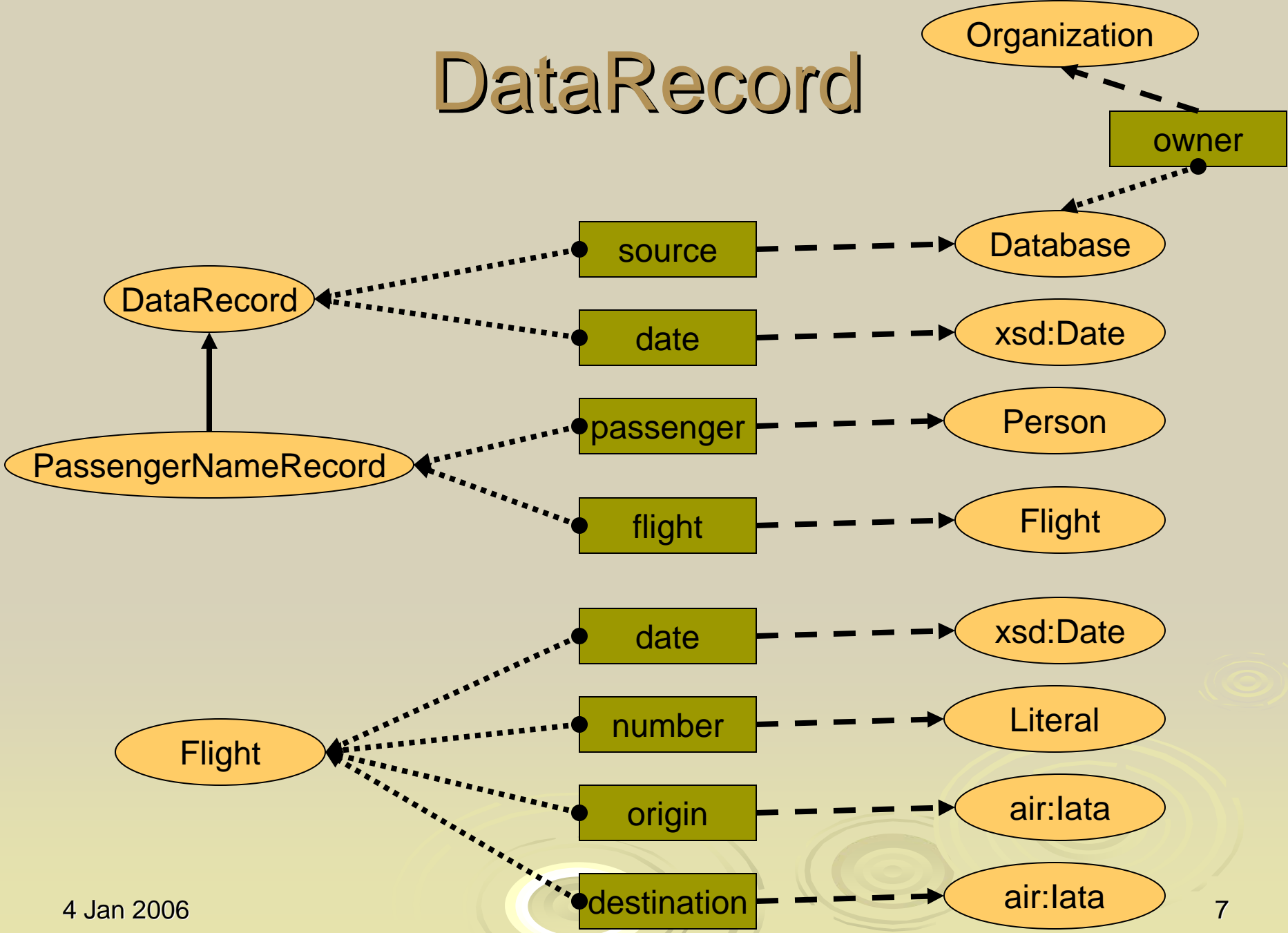
Person



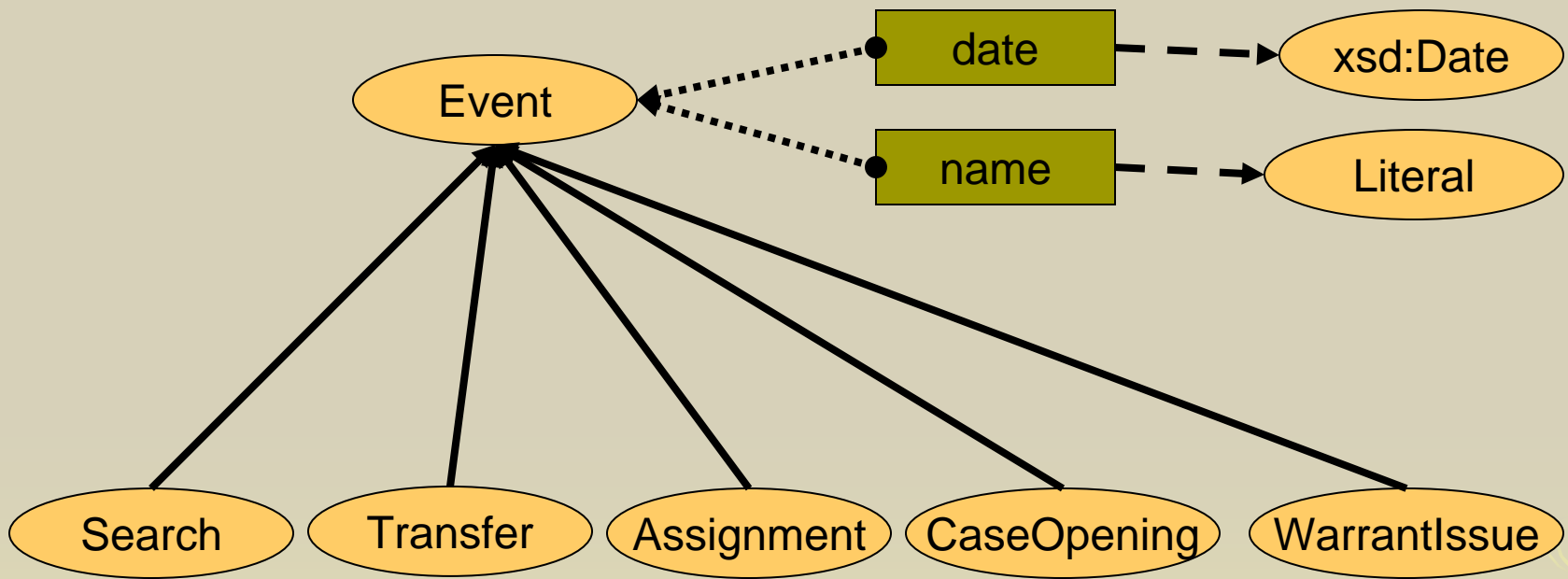
Person (cont.)



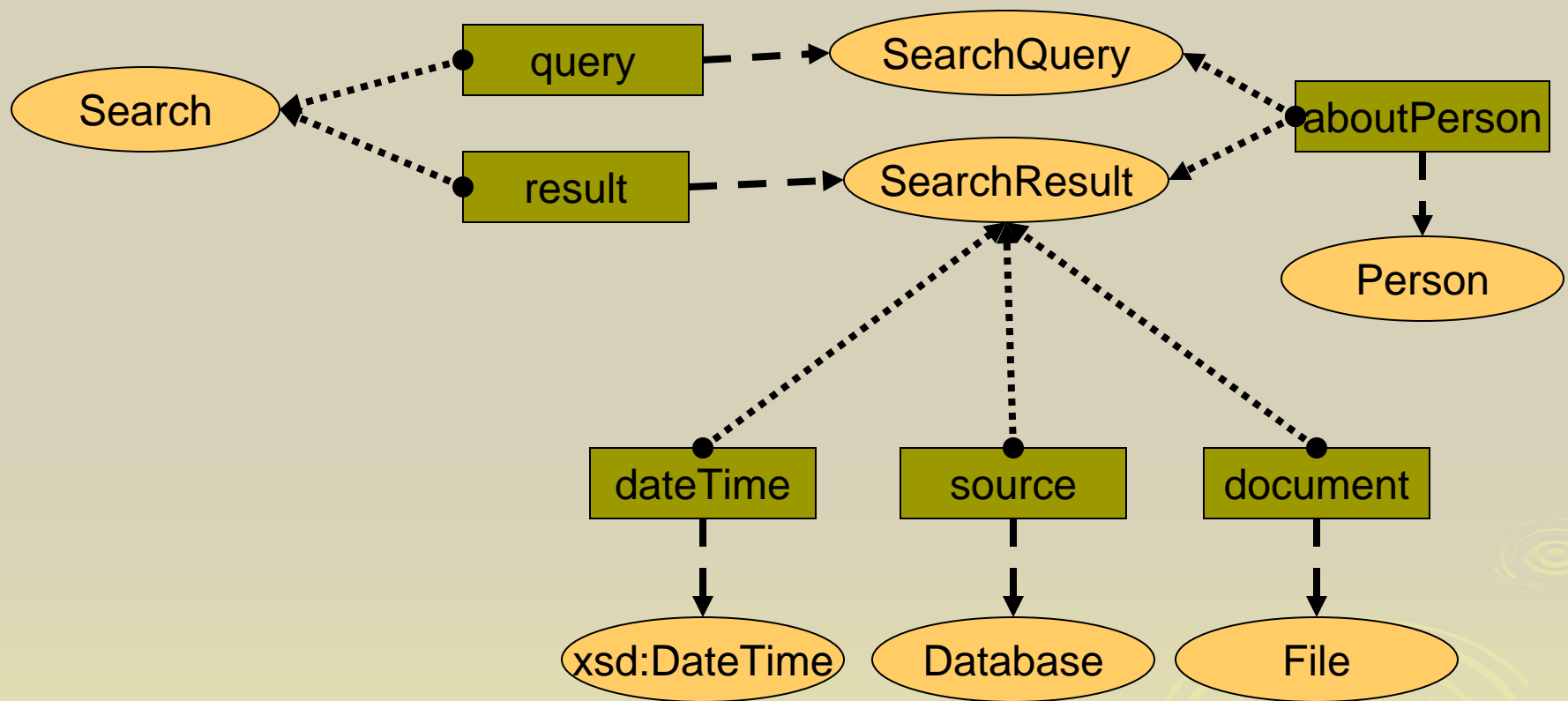
DataRecord



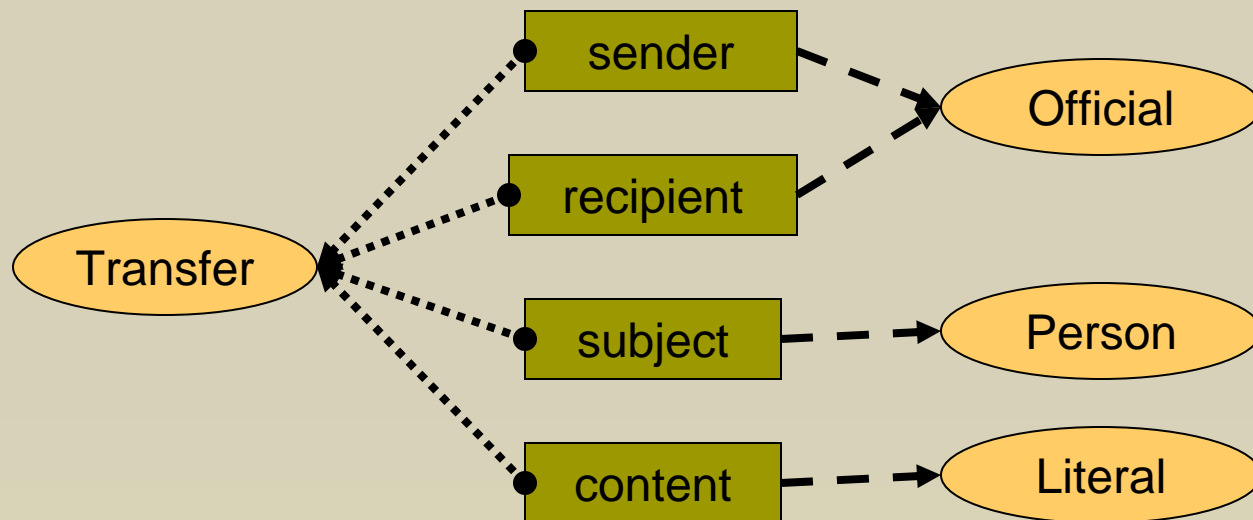
Event



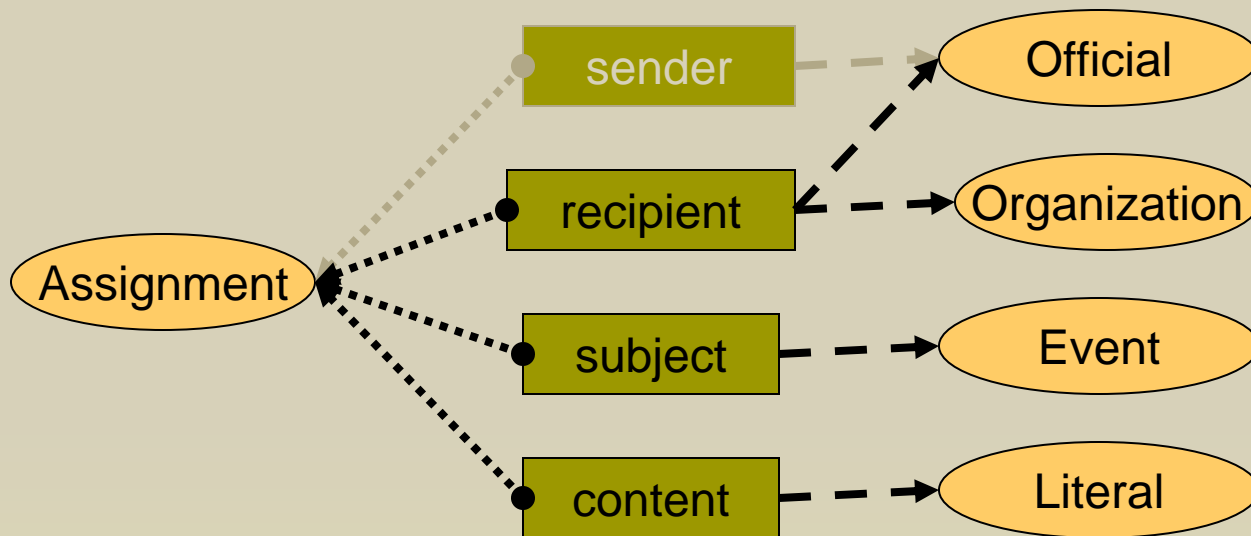
Event: Search



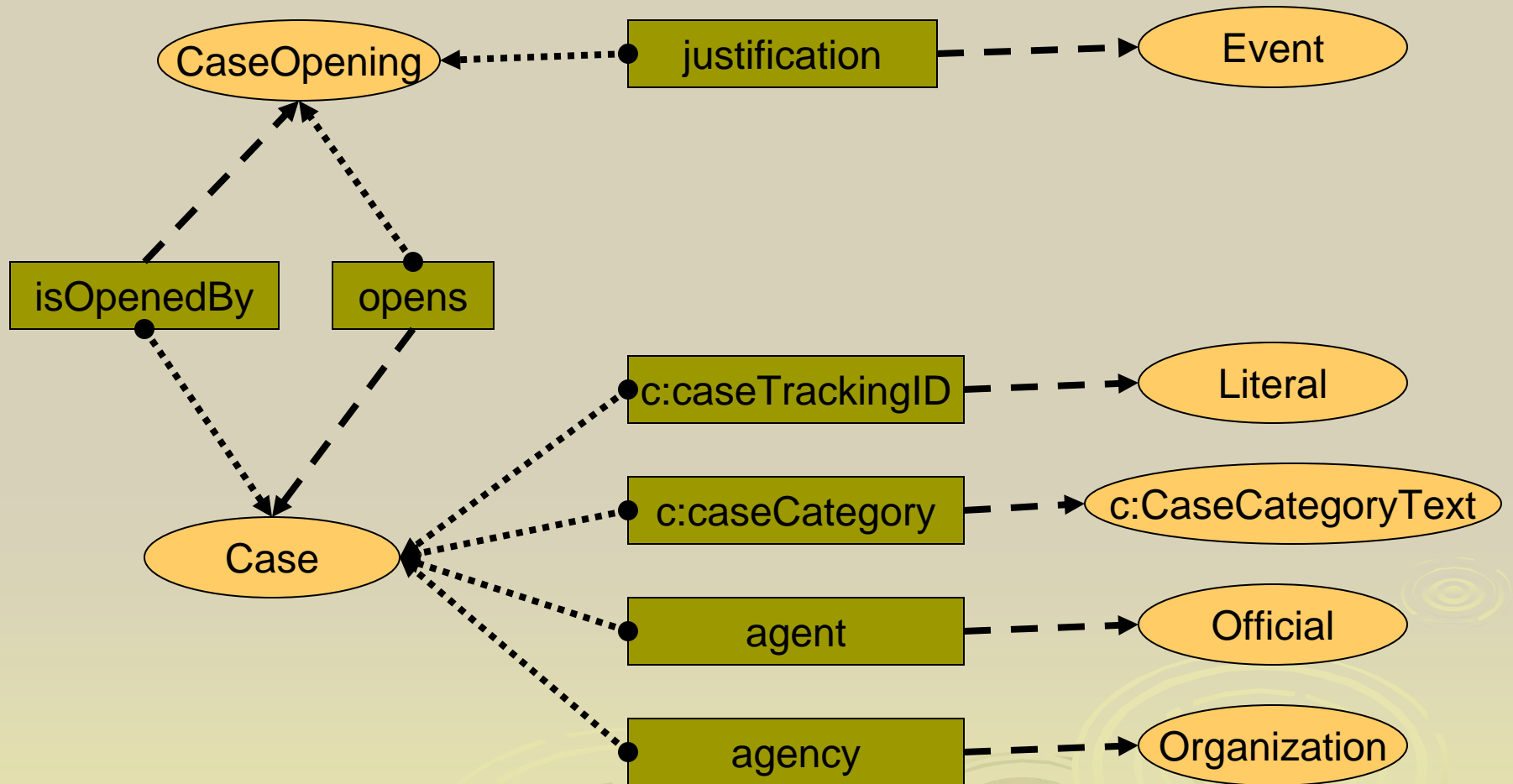
Event: Transfer



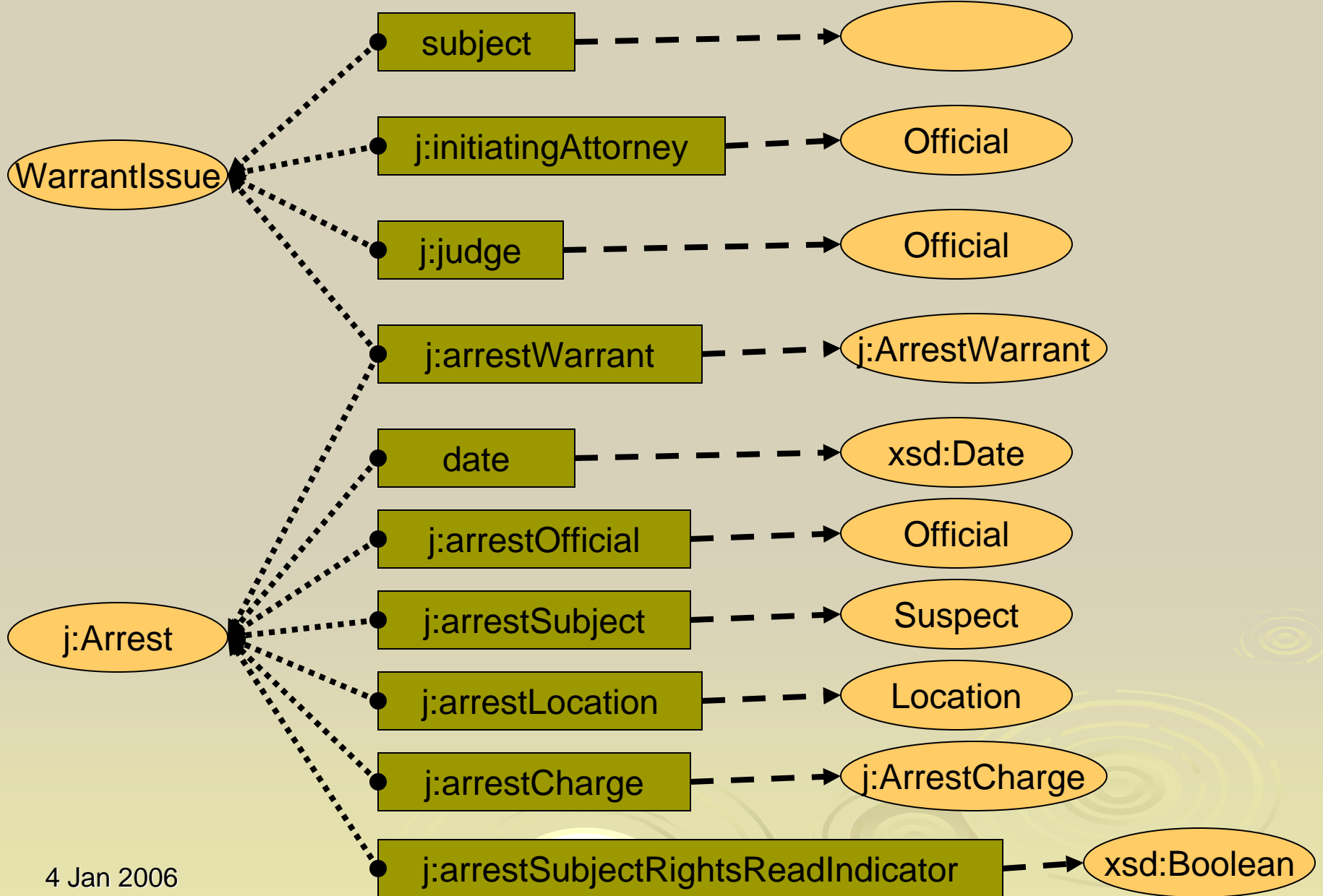
Event: Assignment



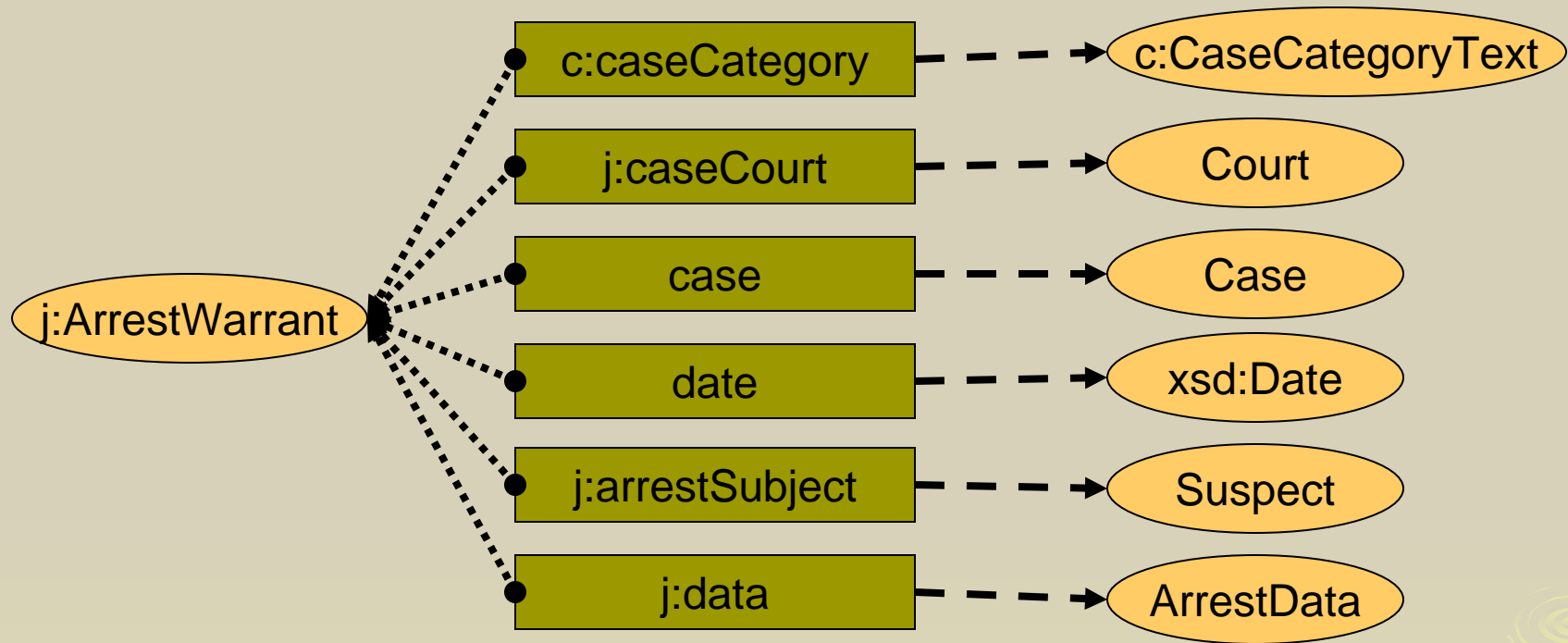
Event: CaseOpening



Event: WarrantIssue



ArrestWarrant



2. A Particular Scenario

- The example as defined by Chris and K, translated to N3
 - The original XML is in the notes part
- Static part
 - Persons
 - Organizations
 - Databases
- Dynamic part
 - Events

Persons

➤ Suspects

- John Doe
- Alice Doe

➤ Officials

- Robinson Duckworth (Criminal Investigator)
- Charles Dodgson
(Special Agent & Assistant US Attorney)
- Anna Liszt (Intelligence Analyst)
- Matt Dillon (Deputy Marshal)

John Doe

➤ :JohnDoe a :Suspect;
:name
 [u:personGivenName "John";
 u:personMiddleName "Henry";
 u:personSurName "Doe"];
:birthDate 1975-08-24;
:homeAddress
 [:locationAddress "123 Main Street";
 :locationCityName "New York";
 :locationStateName "NY";
 :locationPostalCodeID "10044"]

Alice Doe

➤ :AliceDoe a :Suspect;

:name

[u:personGivenName "Alice";

u:personMiddleName "Liddell";

u:personSurName "Doe"];

:homeAddress

[:locationAddress "325 Beacon Street";

:locationCityName "Boston";

:locationStateName "MA";

:locationPostalCodeID "02111"]

.

Robinson Duckworth

➤ :RobinsonDuckworth a :Official;
:name
 [u:personGivenName "Robinson";
 u:personMiddleName "";
 u:personSurName "Duckworth"];
:work
 [:position :CriminalInvestigator;
 :employer :TSA-DC]

Charles Dodgson

- :CharlesDodgson a :Official;
:name
[u:personGivenName "Charles";
u:personMiddleName "Lutwidge";
u:personSurName "Dodgson"];
:work
[:position :SpecialAgent;
:employer :FBI-NYC],
[:position :AssistantUSAttorney;
:employer :USAO-NY]

Anna Liszt

➤ : AnnaLiszt a :Official;
:name
 [u:personGivenName "Anna";
 u:personMiddleName "";
 u:personSurName "Liszt"];
:work
 [:position :IntelligenceAnalyst;
 :employer :FBI-NYC]

Matt Dillon

➤ : MattDillon a :Official;

:name

[u:personGivenName "Matthew";

u:personMiddleName "";

u:personSurName "Dillon"];

:work

[:position :DeputyMarshal;

:employer :marshalls-NY]

▪

Joseph Crater

➤ : JosephCrater a :Official;
:name
[u:personGivenName "Joseph";
u:personMiddleName "F.";
u:personSurName "Crater"];
:work
[:position :Judge;
:employer :NYCFC]

Organizations

- FBI-NYC
- TSA-DC
- JTTF-NY
- Marshals-NY
- USAO-NY
- NYCFC

FBI-NYC

- :FBI-NYC a :Organization;
:organizationName "FBI";
:address
[:locationCityName "New York";
:locationStateName "NY"]

▪

TSA-DC

➤ :TSA-DC a :Organization;
:organizationName "TSA";
:address
[:locationCityName "Washington";
:locationStateName "DC"]

▪

JTTF-NY

- :JTTF-NY a :Organization;
:organizationName
 “Joint Terrorism Task Force”;
:address
 [:locationCityName “New York”;
 :locationStateName “NY”]

Marshals-NY

➤ :Marshals-NY a :Organization;
:organizationName
 “US Marshals”;
:address
 [:locationCityName “New York”;
 :locationStateName “NY”]

USAO

- :USAO-NY a :Organization;
:organizationName
 “United States Attorney's Office”;
:address
 [:locationCityName “New York”;
 :locationStateName “NY”]

NYCFC

- :NYCFC a :Organization;
:organizationName
“New York City Family Court”

▪

MCC

- :MCC a :Organization;
:organizationName
“Metropolitan Correctional Center”

▪

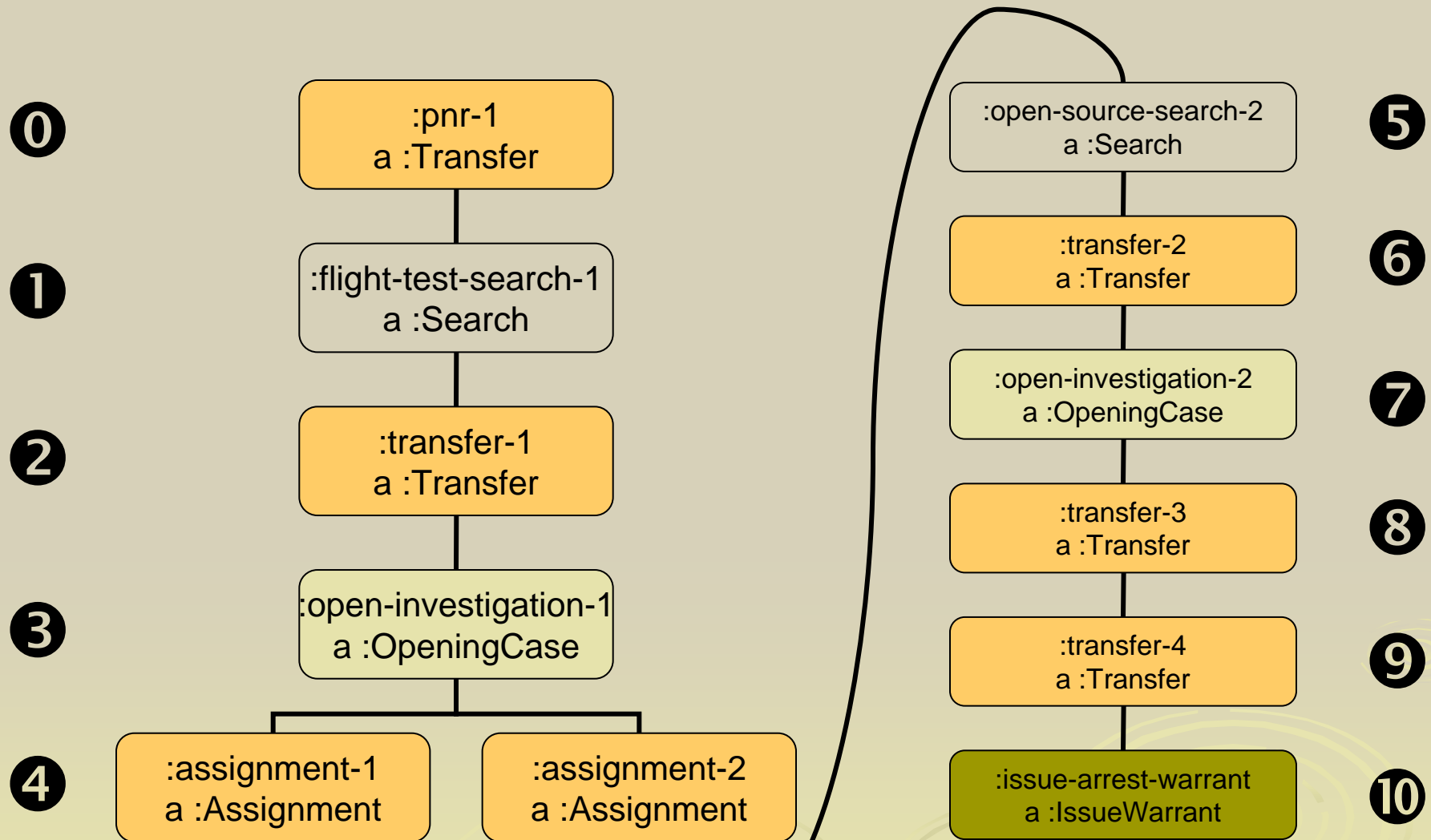
Databases

- :TSDDB a :Database.
- :lexis a :Database;
:owner
[:organizationName "LexisNexis"]
.
- :AA-PNR a :Database
:owner
[:organizationName "American Airlines"]
.

Data Record

- :pnr-1 a :PassengerNameRecord;
 - :source :AA-PNR;
 - :date 2004-06-14;
 - :passenger
 - :name
 - :personGivenName "John",
 - :personMiddleName "Henry",
 - :personSurName "Doe"];
 - :birthDate 1975-08-24];
 - :flight
 - :number "723", :date 2004-06-14,
 - :origin :LGA, :destination :ORD]

Events



① Transfer Event

➤ :receive-pnr-1 a :Transfer;

① Search Event (1)

➤ :flight-test-search-1 a :Search;
:date 2005-09-12;
:name "Secure Flight Test";
:query [:aboutPerson
[:name
[:personGivenName "John",
:personMiddleName "Henry",
:personSurName "Doe"];
:birthDate 1975-08-24]]];

① Search Event (2)

:result

[:datetime 2005-09-12T12:00:01;

:source :TSDB;

:aboutPerson

[:name

[:personGivenName "John",

:personMiddleName "Henry",

:personSurName "Doe"]]

],

① Search Event (3)

```
[ :datetime 2005-09-12T12:00:12;  
  :source :lexis;  
  :aboutPerson  
    [:name  
      [:personGivenName "John",  
       :personMiddleName "Henry",  
       :personSurName "Doe"];  
     :homeAddress  
       [:locationAddress "123 Main Street";  
        :locationCityName "New York";  
        :locationStateName "NY";  
        :locationPostalCodeID "10044"];  
     :birthDate 1975-08-24;  
  ],
```

① Search Event (4)

```
[ :datetime 2005-09-12T12:00:15;  
  :source :lexis;  
  :aboutPerson  
    [:name  
      [:personGivenName "John",  
       :personMiddleName "Henry",  
       :personSurName "Doe"];  
     :homeAddress  
       [:locationAddress "723 High Street";  
        :locationCityName "Seattle";  
        :locationStateName "WA";  
        :locationPostalCodeID "98104"];  
     :birthDate 1975-08-24;  
  ].
```

② Transfer Event

- :transfer-1 a :Transfer;
:date 2005-09-17;
:name "0876553";
:sender :RobinsonDuckworth;
:recipient :CharlesDodgson;
:subject :JohnDoe;
:content
"Secure flight match. Possible terror suspect"

③ OpeningCase Event

➤ :open-investigation-1 a :OpeningCase;
:justification :transfer-1;
:opens investigation-1

.

➤ :investigation-1 a :Case;
c:caseTrackingID "555NY5678";
c:caseCategory :intelligence;
xsd:date 2005-09-18;
:agent :CharlesDodgson;
:agency :FBI-NYC;
:isOpenedBy :open-investigation-1

.

④ Assignment Events

➤ :assignment-1 a :Assignment;
:subject :investigation-1;
:recipient :JTTF-NY

▪

➤ :assignment-2 a :Assignment;
:subject :investigation-1;
:recipient :AnnaLiszt;

▪

5 Search Event (1)

```
➤ :open-source-search-2 a :Search;  
  :query [:aboutPerson  
    [:name  
      [:personGivenName "John",  
       :personMiddleName "Henry",  
       :personSurName "Doe"];  
      :homeAddress  
        [:locationAddress "123 Main Street";  
         :locationCityName "New York";  
         :locationStateName "NY";  
         :locationPostalCodeID "10044"];  
      :birthDate 1975-08-24;  
    ]  
  ];
```

⑤ Search Event (2)

:result

[:datetime 2005-10-02T12:00:01;

:source

<[http://appsext4.dos.state.ny.us/
csewarrants_public/cse_search](http://appsext4.dos.state.ny.us/csewarrants_public/cse_search)>;

:document :ny-warrant

]

⑥ Transfer Event

➤ :transfer-2 a :Transfer;
:date 2005-10-04;
:name "456382";
:sender :CharlesDodgson;
:recipient :MattDillon;

▪

⑦ OpeningCase Event

➤ :open-investigation-2 a :OpeningCase;
:justification :transfer-2;
:opens investigation-2

▪

➤ :investigation-2 a :Case;
c:caseTrackingID "NY-05-2114";
c:caseCategory :criminal;
xsd:date 2005-10-05;
:agent :MattDillon;
:agency :Marshals-NY;
:isOpenedBy :open-investigation-2

▪

⑧ Transfer Event

➤ :transfer-3 a :Transfer;
:date 2005-10-04;
:name “???”;
:sender : MattDillon;
:recipient :???

▪

⑨ Transfer Event

➤ :transfer-4 a :Transfer;
:date 2005-10-04;
:name “???”;
:sender : MattDillon;
:recipient :CharlesDodgson

▪

⑩ WarrantIssue Event

- :issue-arrest-warrant a :WarrantIssue;
:subject "warrant-2";
j:caseInitiatingAttorney :CharlesDodgson;
j:caseJudge :JosephCrater;
j:arrestWarrant :05-NY-2343-CR-JFC

Arrest Warrant

➤ :05-NY-2343-CR-JFC a j:ArrestWarrant;
c:caseCategory :criminal;
:case :C970090587W001;
j:caseCourt :NYCFC;
xsd:date 1997-04-03;
j:arrestSubject :JohnDoe;
j:data :SomeData

Arrest

- :18USC228 a j:ArrestCharge.
- [:date 2005-11-01;
j:arrestOfficial :MattDillon;
j:arrestWarrant :05-NY-2343-CR-JFC;
j:arrestSubject :JohnDoe;
j:arrestLocation [:locationCityName "Seattle";
 :locationStateName "WA"];
j:arrestCharge :18USC228;
j:arrestSubjectRightsReadIndicator true]
a j:Arrest

3. Some General Rules

- One could define
 - Rules to check the correctness
 - Rules to infer new (non-Boolean) facts

A Correctness Checking Rule

- A search result must be consistent with the search query.
- *If there is a PersonSurName in the query of a search and in its result, then they must be the same.*
- ```
{?s a :Search.
?psn1 a :Literal. ?psn2 a :Literal.
?psn1 :personSurName [:name [:aboutPerson
[:query ?s]]]
log:and
?psn2 :personSurName [:name [:aboutPerson
[:result ?s]]]
=> ?psn1=?pns2}.
```

# A Correctness Checking Rule

- Arrests can only be done with an ArrestWarrant.
- *If there is an Arrest, then there must exist a corresponding ArrestWarrant.*
- `{?a a :Arrest}`  
`=>`  
`{_:aw a j:ArrestWarrant.`  
`_:aw j:arrestWarrant ?a}`.

# A Correctness Checking Rule

- A official cannot arrest himself.
- *Official and Subject in an Arrest must be different persons.*
- `{?a a :Arrest.  
?ao a :Person. ?s a:Person.  
?ao j:arrestOfficial ?a log.and  
?s j:arrestSubject ?a}  
=>  
{log:not (?ao = ?s)}.`

## 4. Some Particular Inferences

- They would be obtained from the application of the rules to the particular scenario.