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BAE SYSTEMS

The MUSTT of Metadata

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Message

- Meta data is Business Process Data
  - Used in decisions that control processes
  - So is defined by business processes

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BAE System on a Page

BAE Systems is a global defence and security company with approximately 100,000 employees worldwide.

The Company delivers a full range of products and services for air, land and naval forces, as well as advanced electronics, security, information technology solutions and support services.

Key Facts

- 2nd largest global defence company based on 2010 revenues*
- Global capability
- Customers in more than 100 countries
- 2010 sales of £22.4 billion

* Source: Defense News Annual Ranking, published July 2011

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Contents

- No such *thing* as meta data
- Meta Data is defined by process
- The MUSTT Principle
- MUSTT as Process Data
- Exception - Search terms

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No such thing as meta data

Claim: Meta Data is defined with respect to a process

- Meta data is:
  - Relative to some data **artefact**
  - Controls the routes from creation to consumption
- For Example: Dublin Core meta data {...*Author..}*
  - Used to find books or papers
  - Contributes to *Trust* of the book
  - Is **not** meta data to an author payments system
- Meta data changes according to viewpoint

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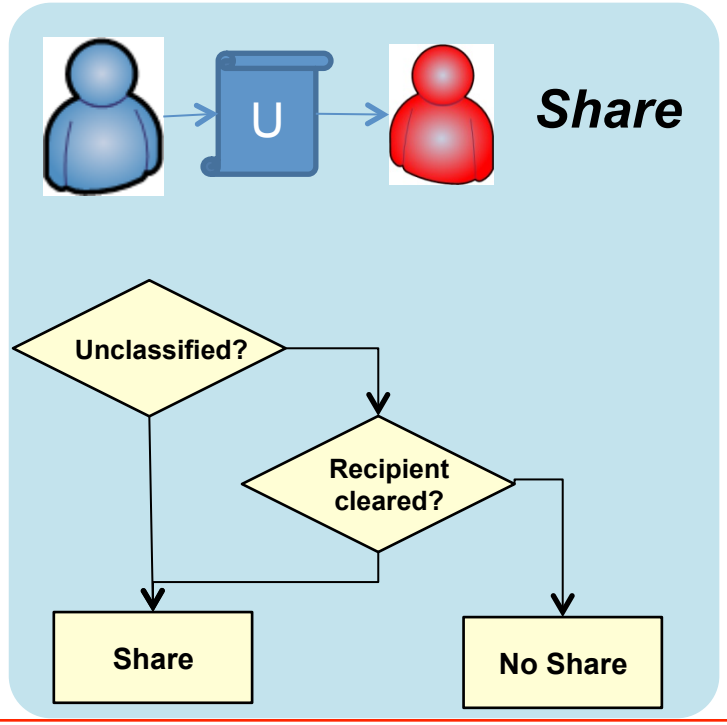
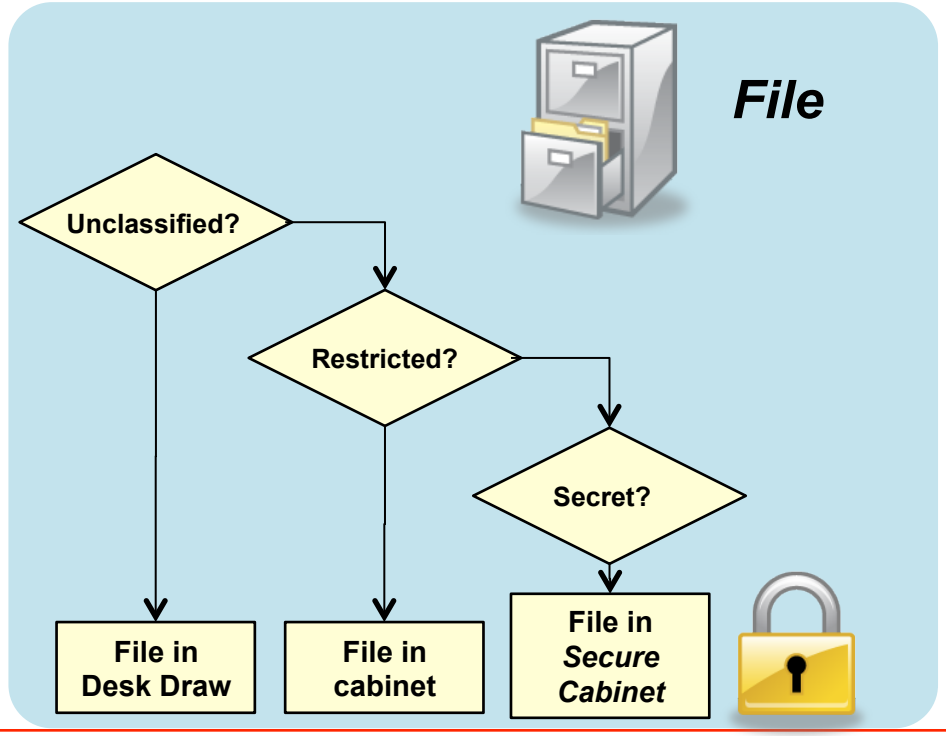
Meta data matches Business Process

- Example: Security Classification
  - Defines the measures needed to protect a document
  - Example business processes: Share, File





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MUSTT Principle

MUSTT principle -

match meta data to the process

What Business Processes? What Data?

MUSTT - five key groups of process:

- Management
  - for keeping track of artefact - e.g. document Id
- Usage
  - who can do what to artefact - e.g. you can read it if you pay
- Search
  - clues to letting someone find the artefact, e.g. keywords
- Trust
  - how reliable and accurate is the artefact e.g. draft or final?
- Technical
  - Used by software - e.g. image size

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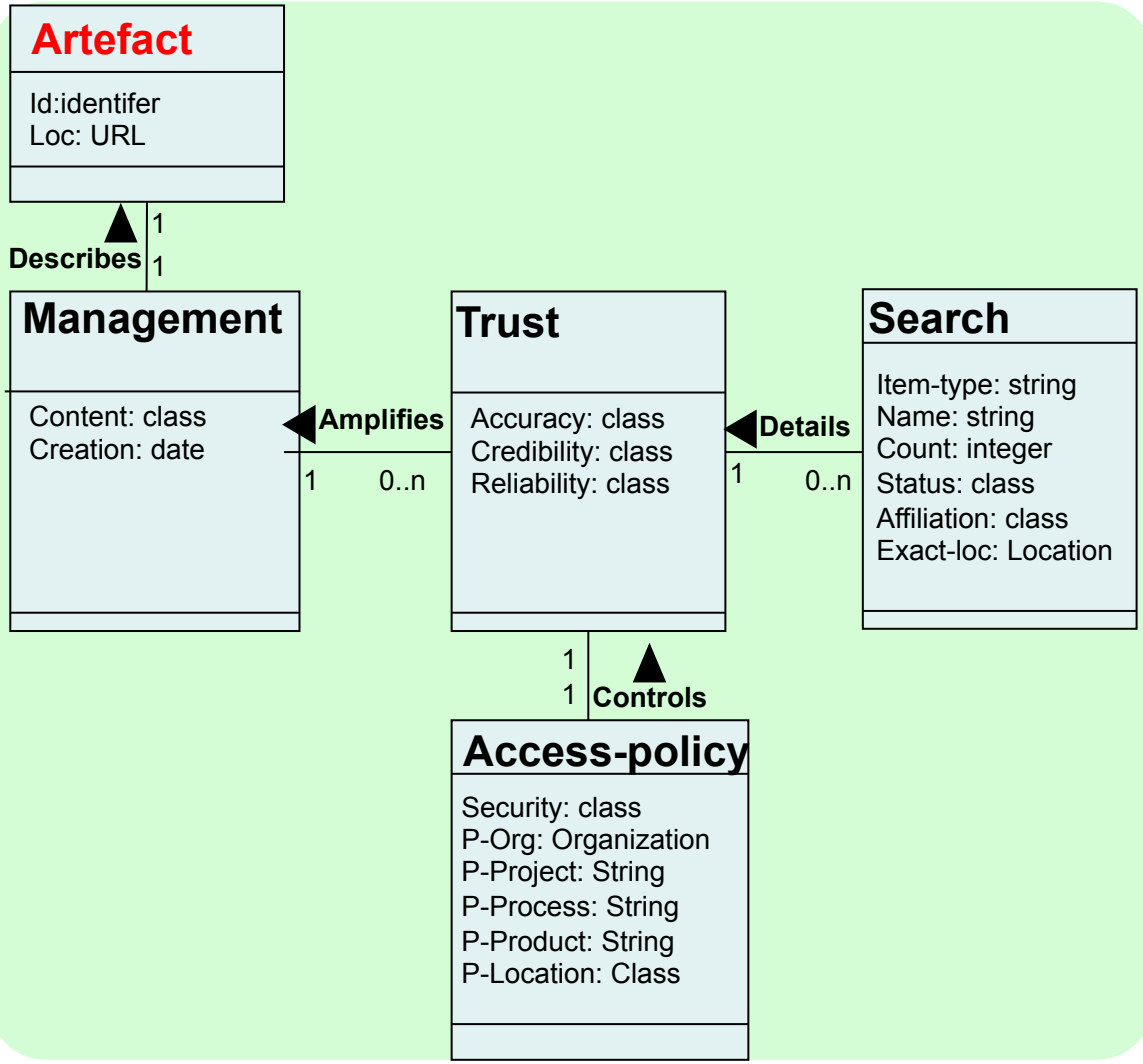
MUSTT in ISRMDUM

Query across ISR sources:
- Document repositories
- Databases
- Website...

Complex Search Model
- based on JC3IEDM
- Search community:
  - Field HQ

Semantic technology
- Automatic query decomposition

Common meta data based on MUSTT



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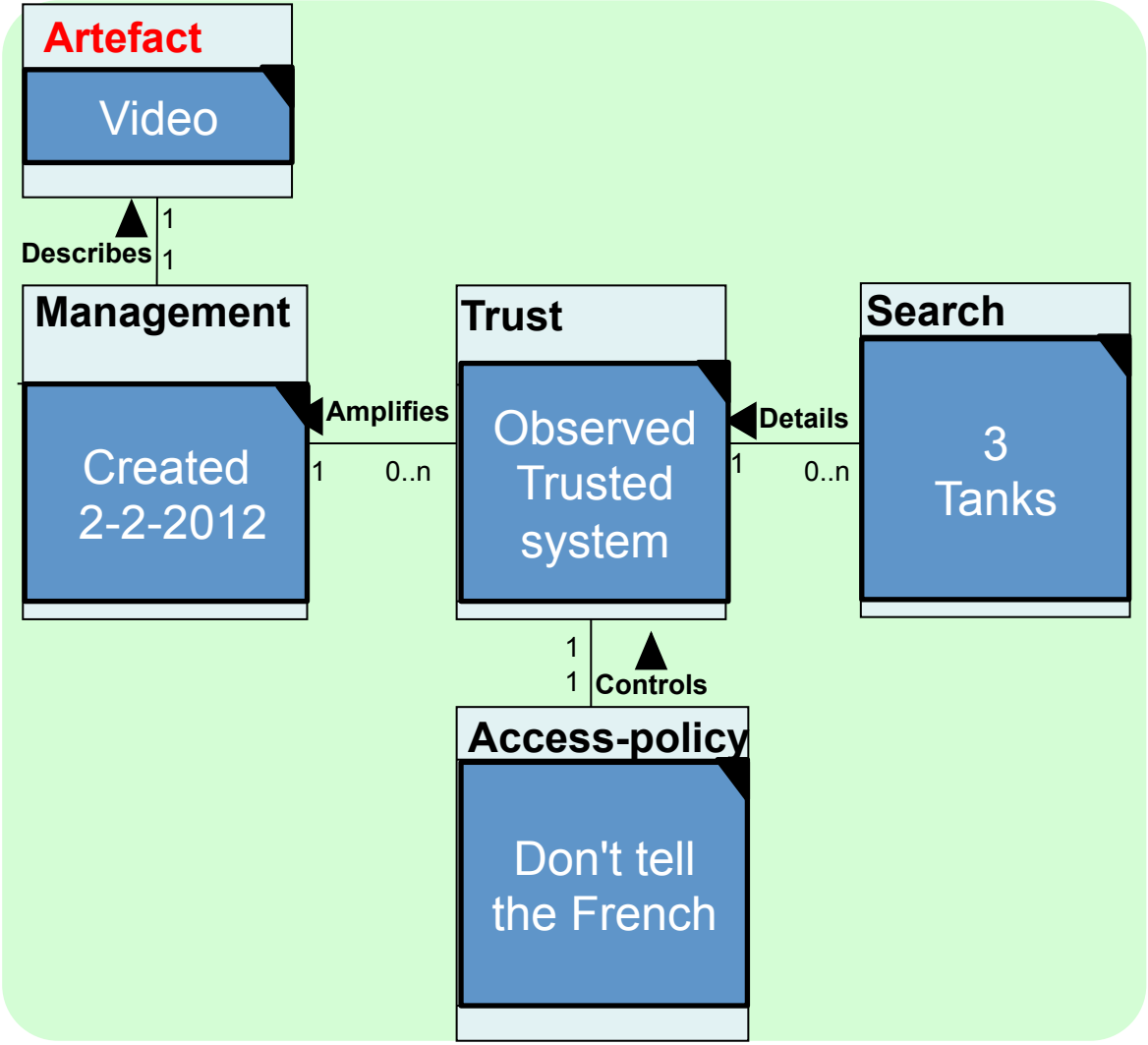
MUSTT in ISRMDUM

Example Data



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Usage Control

Usage = What can this person do with the artefact?

- Security & Access Control
- IPR, Copyright
- Contractual rights

E.g. Access Control

- What credentials that are needed?
  - Is person in organization? Does person work on project?
  - Is person cleared to the right level? In the right building?
- What Actions are permitted?
  - e.g. read, read-5-times, read-unclassified-extract
- What Consequences follow?
  - Access is logged
  - Payment each time the artefact is accessed

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Trust

Trust data to assess the quality of the artefact

- Example: Intelligence Data (JC3IEDM)
  - Is the report a rumour or what was actually seen?
  - Is the informant a reliable witness?
  - Are there other correlating sources?
- Example: Document
  - Is it a draft or the final issue?
  - What organization prepared it?

- Special Consideration: Evidential Weight
  - Evidence that the artefact is what it purports to be. e.g.:
    - Digital Signature
    - Chain of custody

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Exception Search

Search is not precise

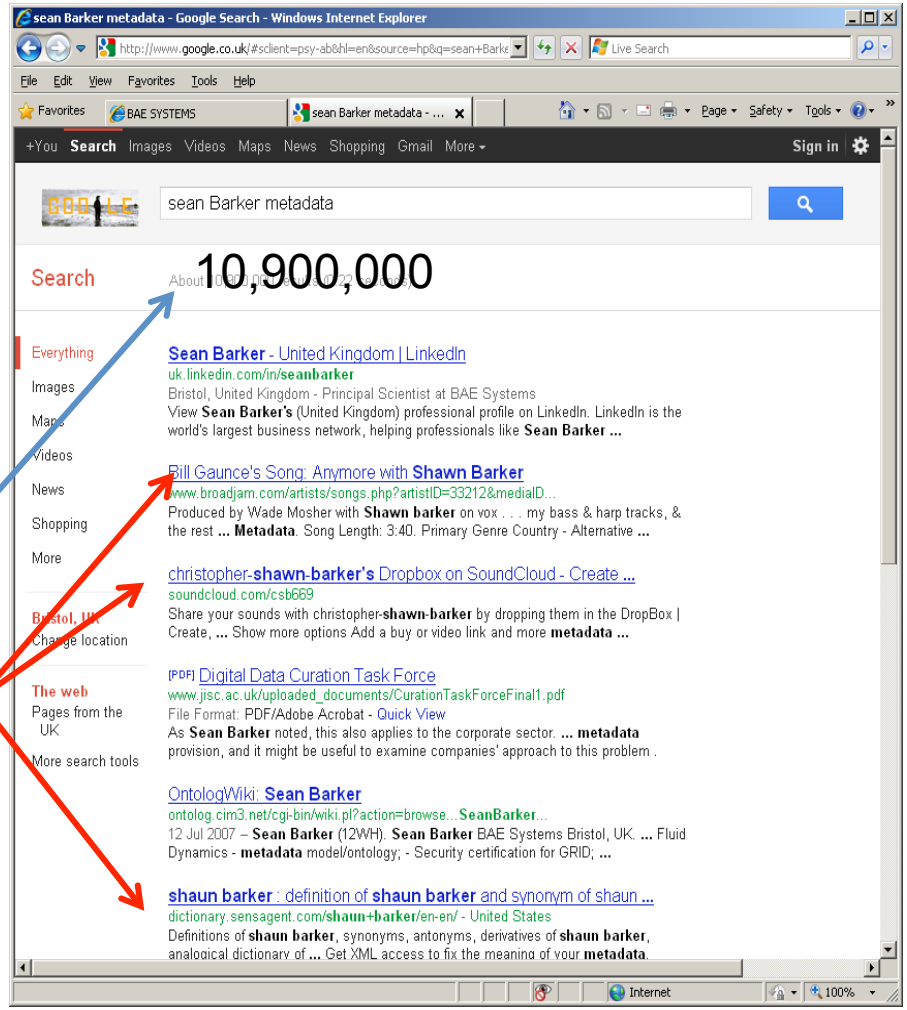
Search creates two Sets

ACCEPT - possible matches

REJECT - not matches

BUT

- ACCEPT Set is too large to check every answer
- ACCEPT Set contains many non-matches
- REJECT may contain valid answers



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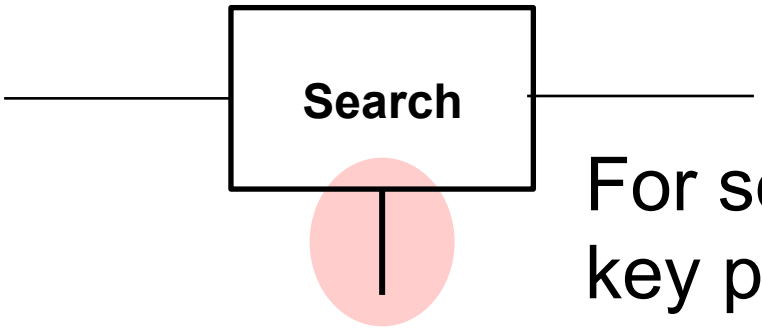
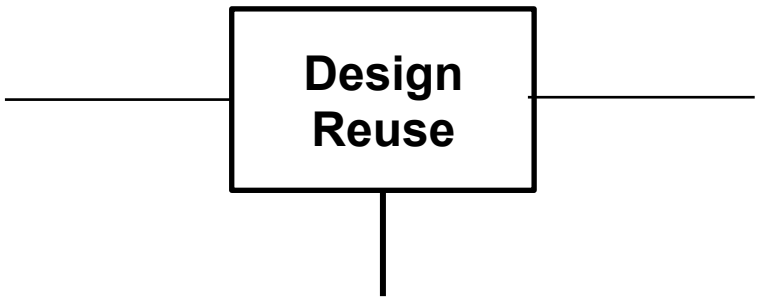
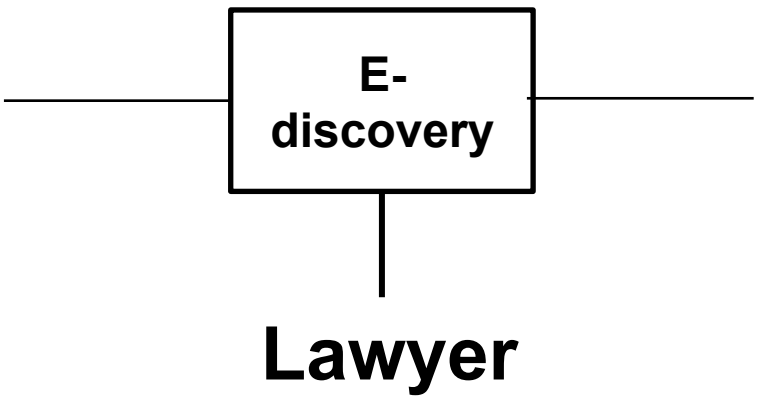
Search Process



For search meta data, the key parameter is the searcher





Search terms are defined by the designated communities of users

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Exception - Search

View Search through Game Theory

Match in ACCEPT **GAIN!**	non-match in ACCEPT **LOSE**
Match in REJECT **LOSE**	non-match in REJECT **gain**

Win overall if

P(gain)*gain > P(loss)*cost-of-loss

Probability Factors:

- \+ Terms are common between creator and user
- \- Some users use a different term for the same thing
- \- Some creators use term in a different way
- \- Many terms are inherently ambiguous

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Search Precision

Natural language is imprecise

Search involves both selection and ranking

Ranking - the probability an artefact fits into the ACCEPT set

- Semantic search is precise
  - Search as selection only
  - removes homonym ambiguity: e.g. Tank
  - removes role ambiguity
    - Which is the biographer?
  - Can use class hierarchies

A.N. Wilson Iris Murdoch

However - user (natural) language ≠ formal semantics

Users are vague, imprecise, inconsistent even when using "semantic" terms

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Conclusions and summary

- Meta data is about business processes
- The MUSTT principle helps identify relevant processes and matching data
- The key question:
  - Do the data elements help choose between one process step or another?
- MUSTT means meta data is more focussed and more precise
  - Avoids cost of redundant meta data
  - Avoids losses of inconsistent process decisions