

Datrix to SPOOL

An Experience Report on Converting Interchange Formats

Guy St-Denis (g.stdenis@computer.org)



GXL Workshop @ CASCON, Toronto, November 15 2000

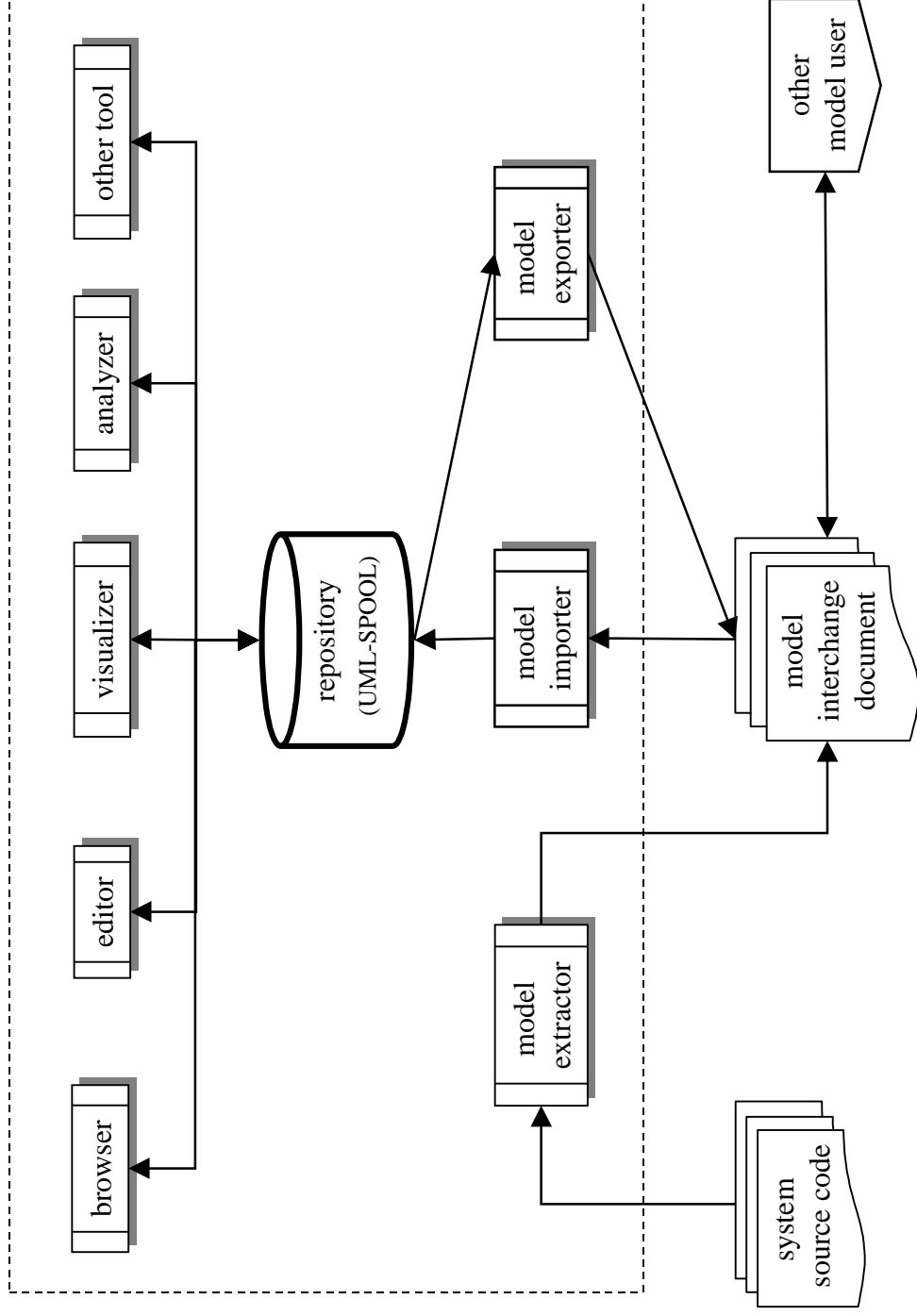


Outline

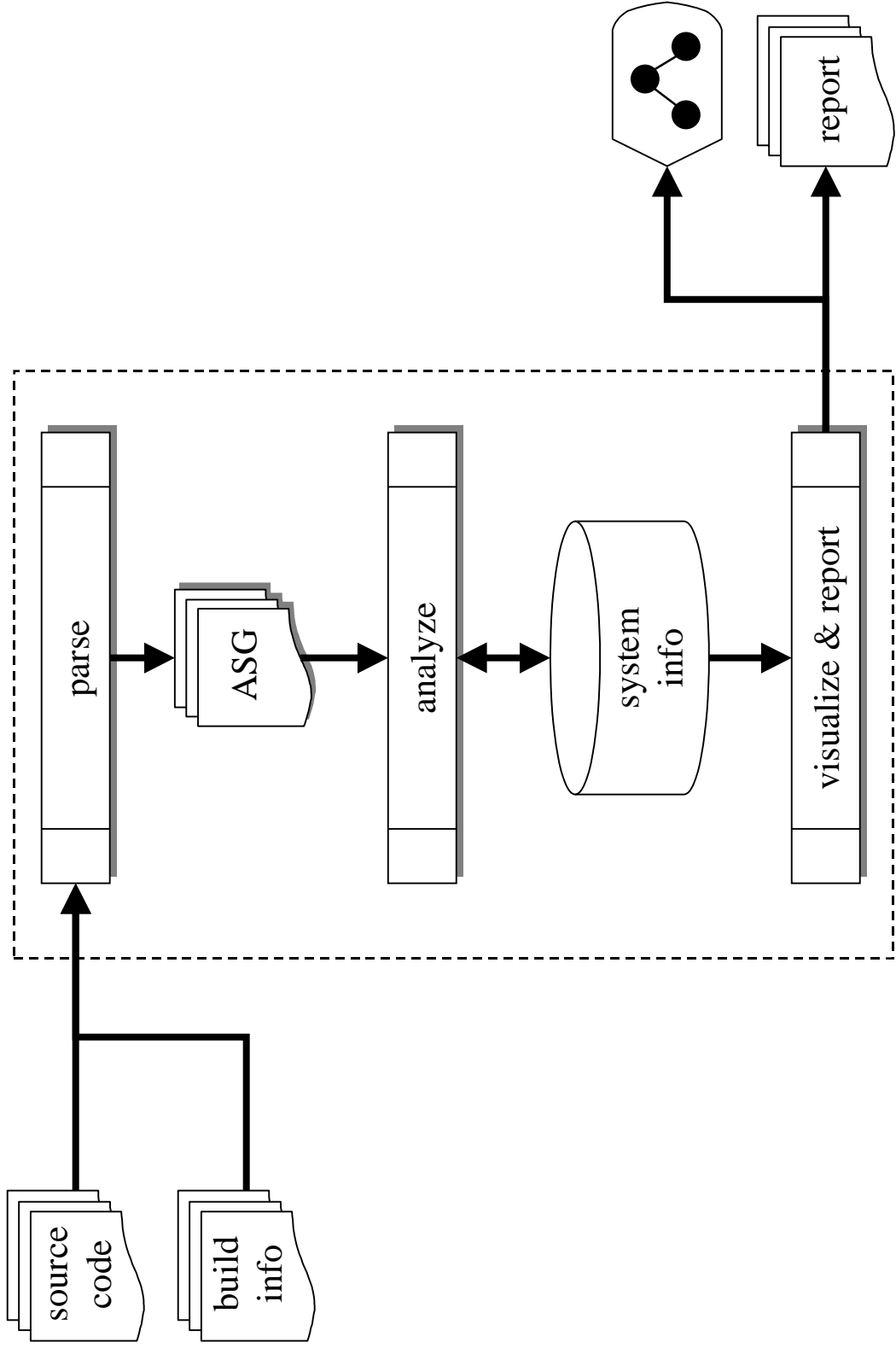
- Background
- Problem & solution
- Differences overview
 - schema, encoding, document structure
- Conversion details
- Conclusions
- Links



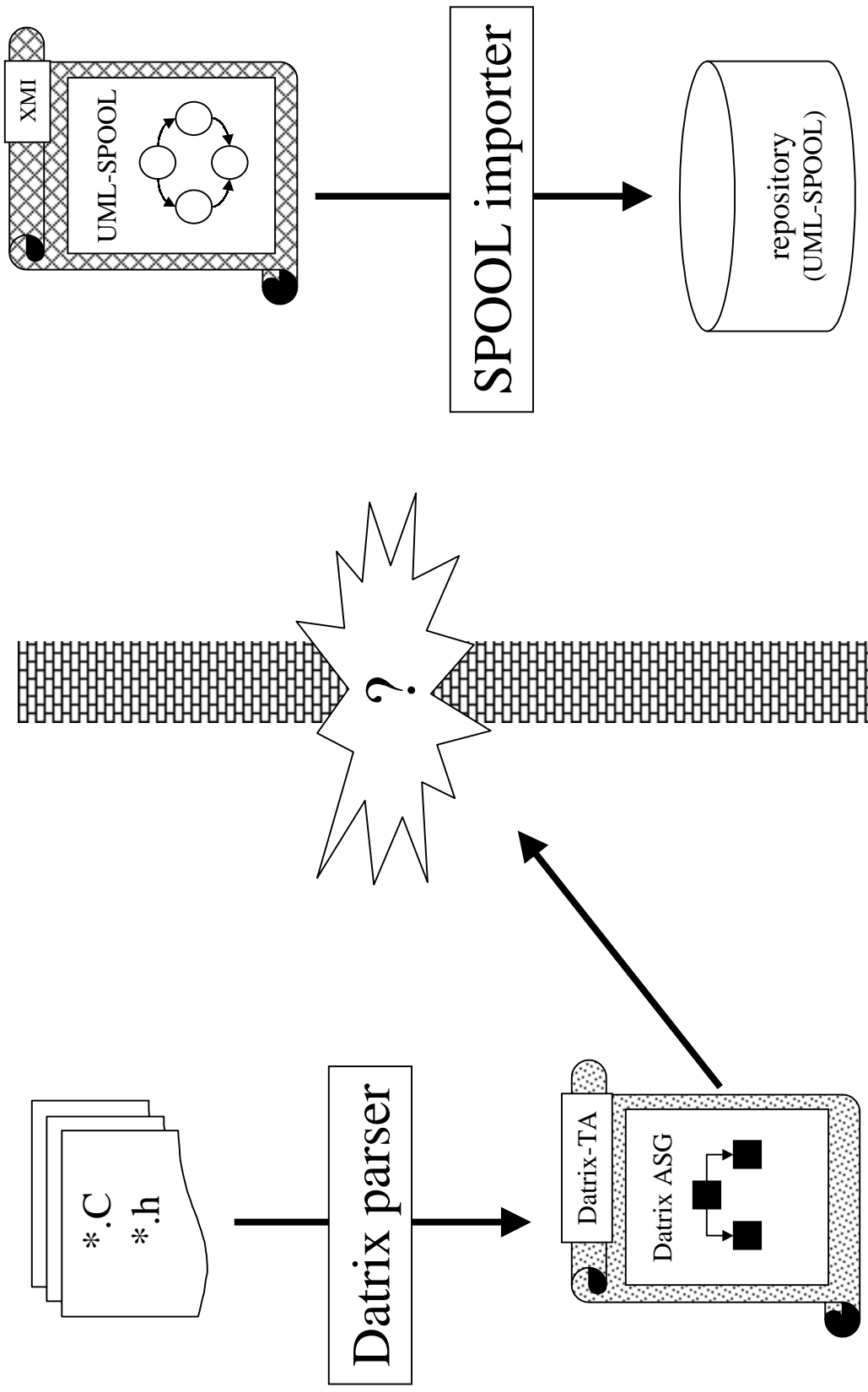
SPOOL overview



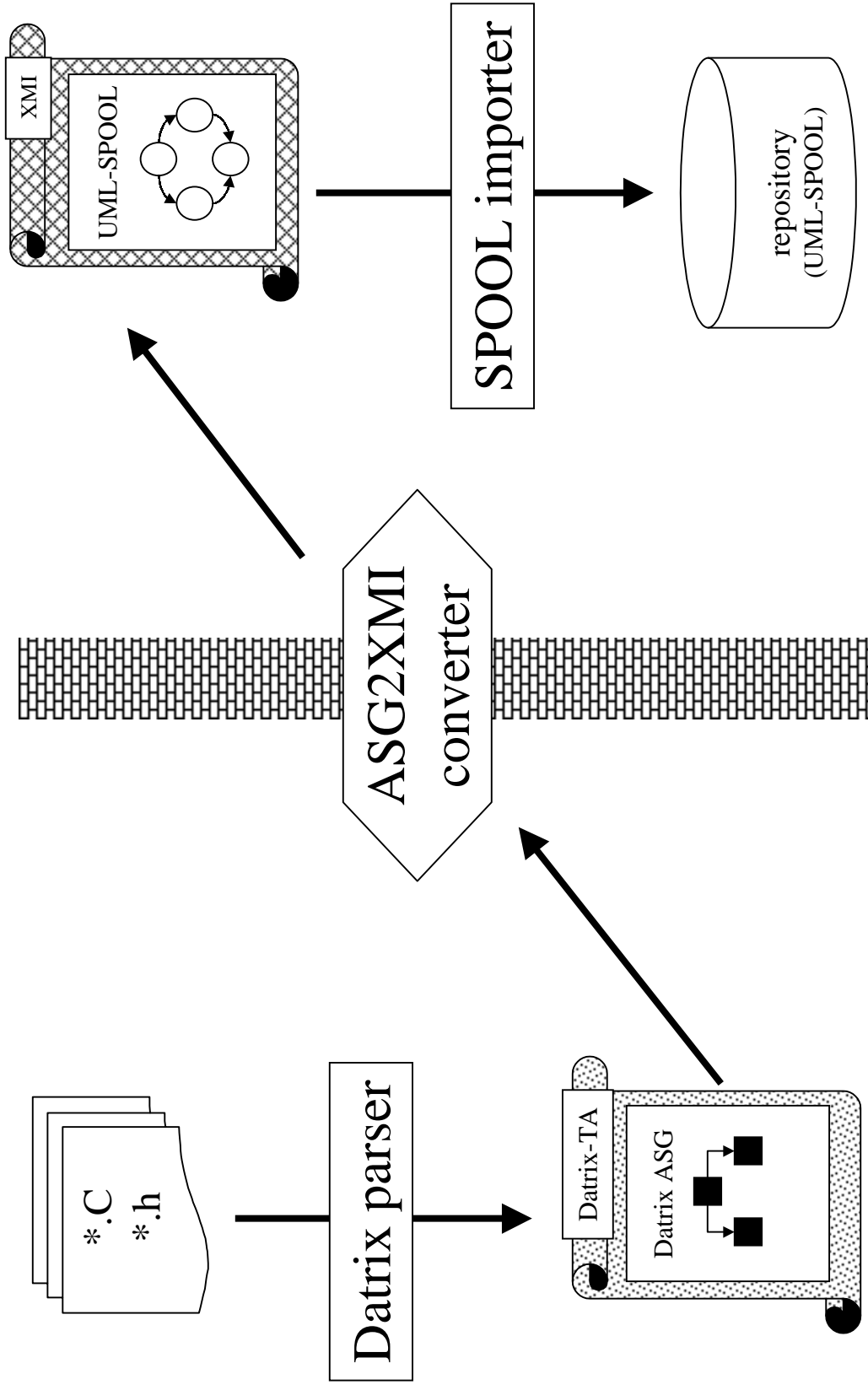
Datrix overview



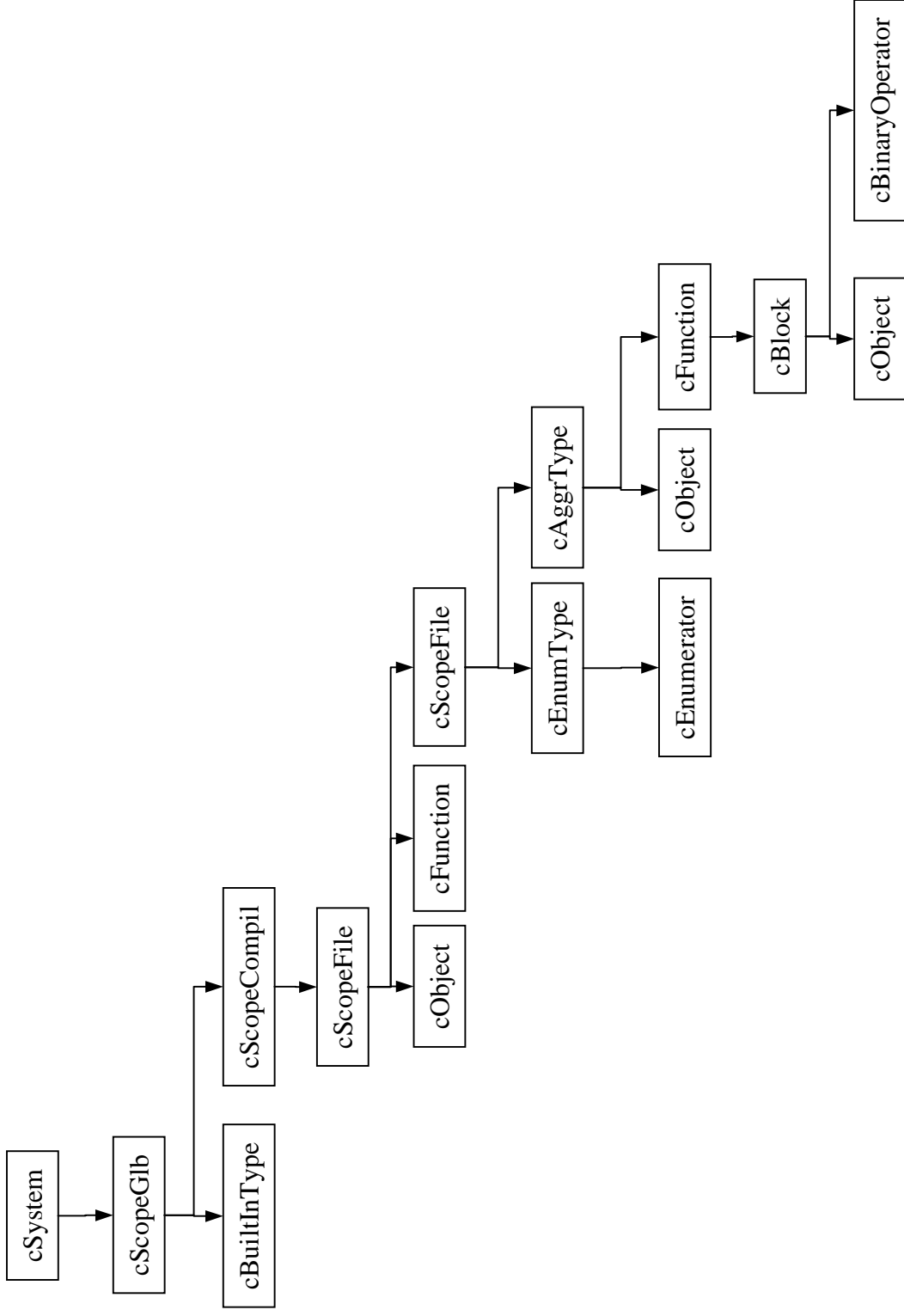
The problem



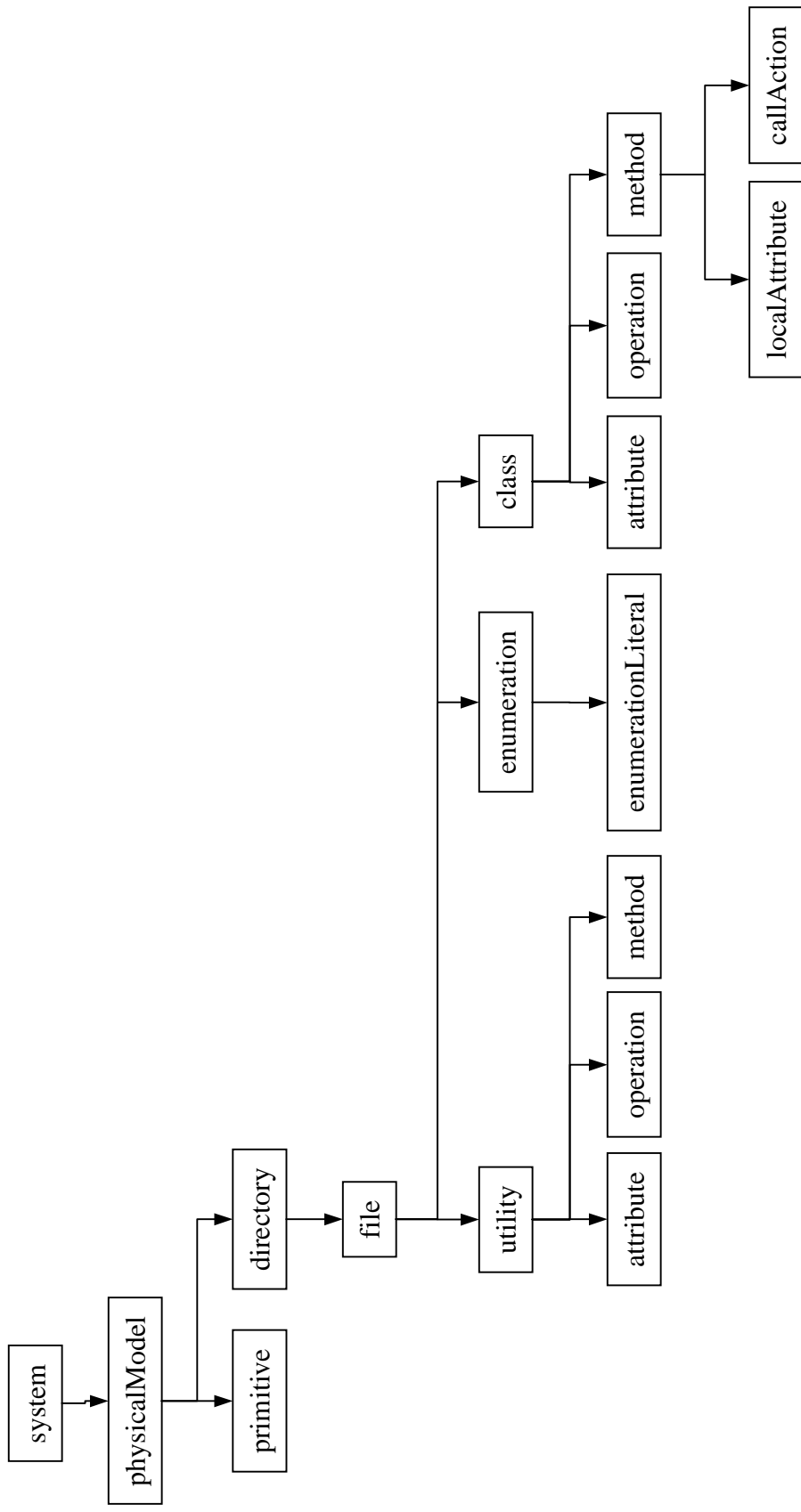
A solution



Schema overview : Datrix ASG



Schema overview : UML-SPOOL



Encoding overview : Datrix TA

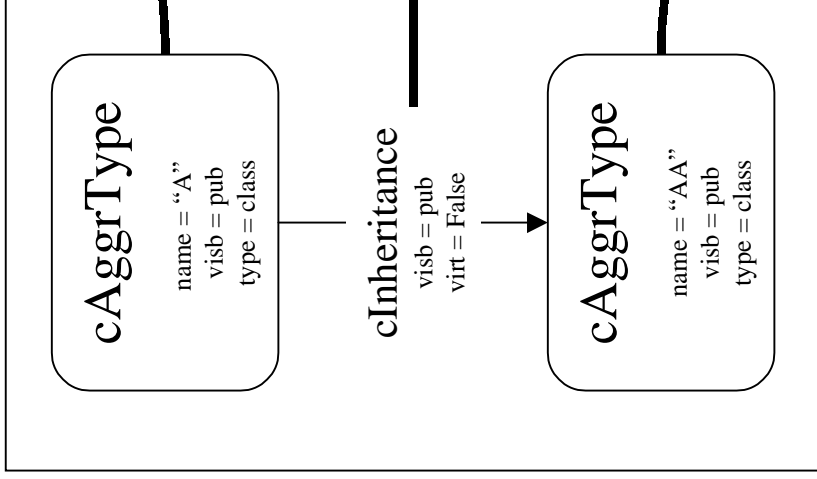
Source code

“C++”

```
class A {};  
class AA : public A {};
```

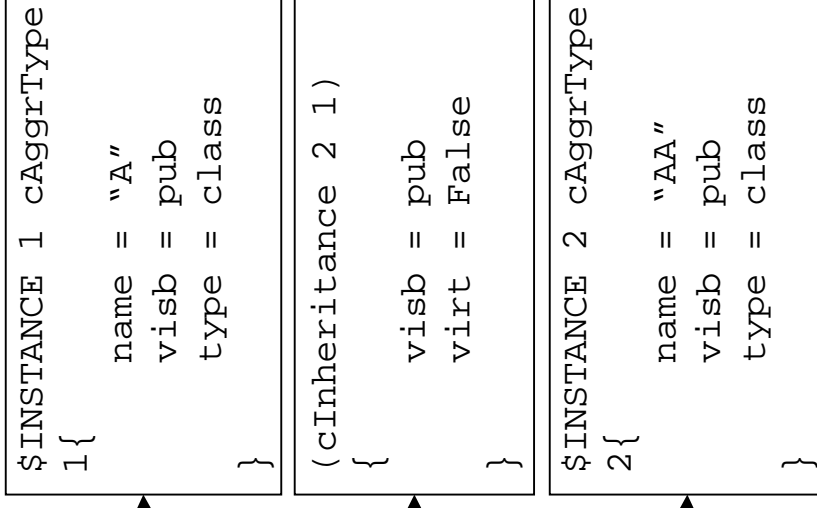
Schema

“Datrix ASG”



Interchange format

“Datrix_TA”



Encoding overview : XMI.UML

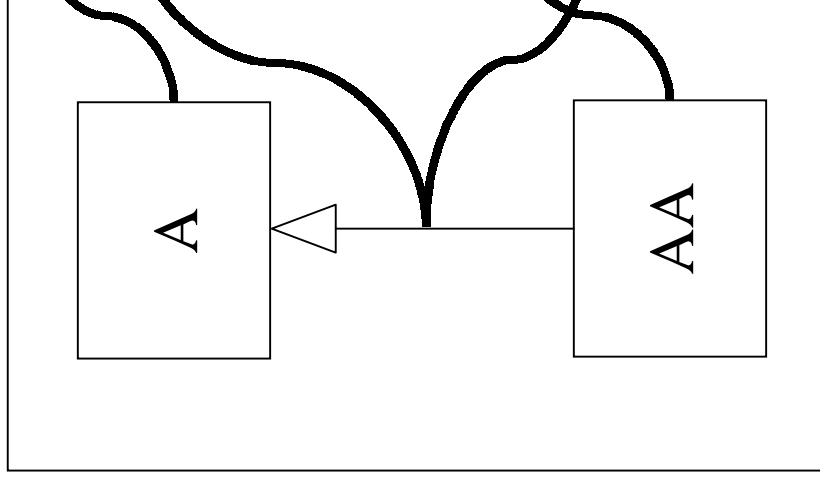
Source code

“C++”

```
class A {};  
class AA : public A {};
```

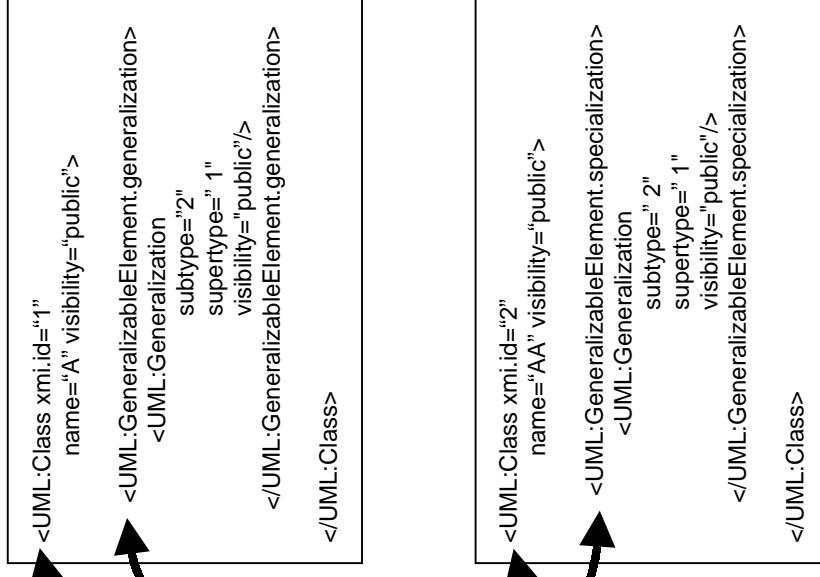
Schema

“UML metamodel”



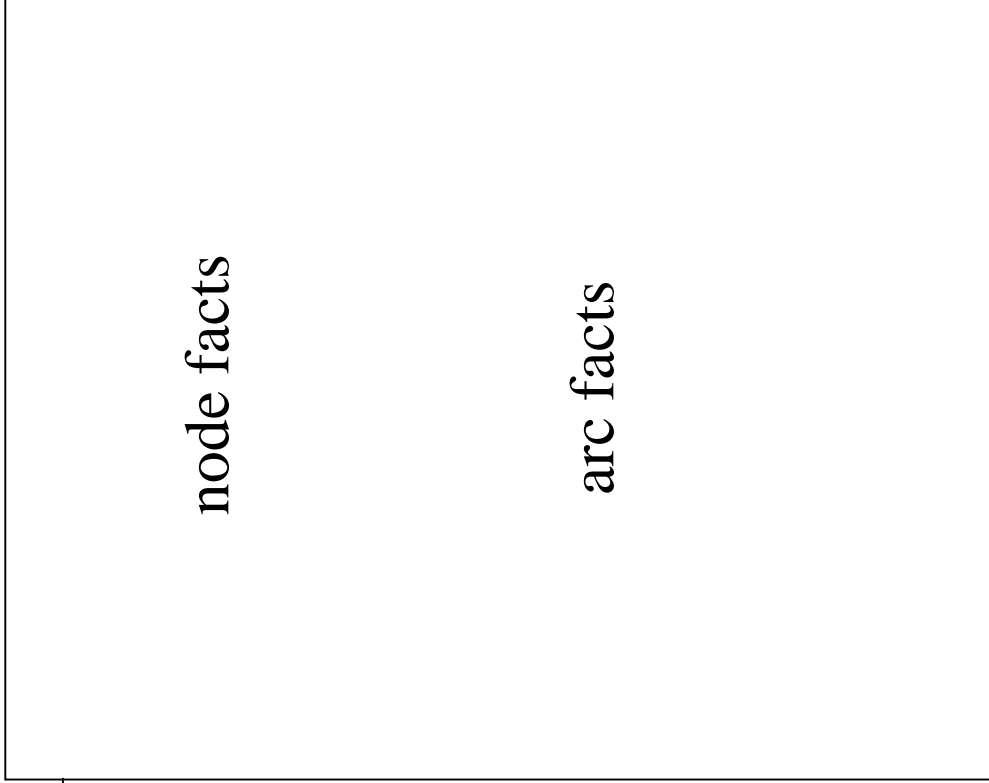
Interchange format

“XMI.UML”



Document overview : Datrix TA

Datrix TA

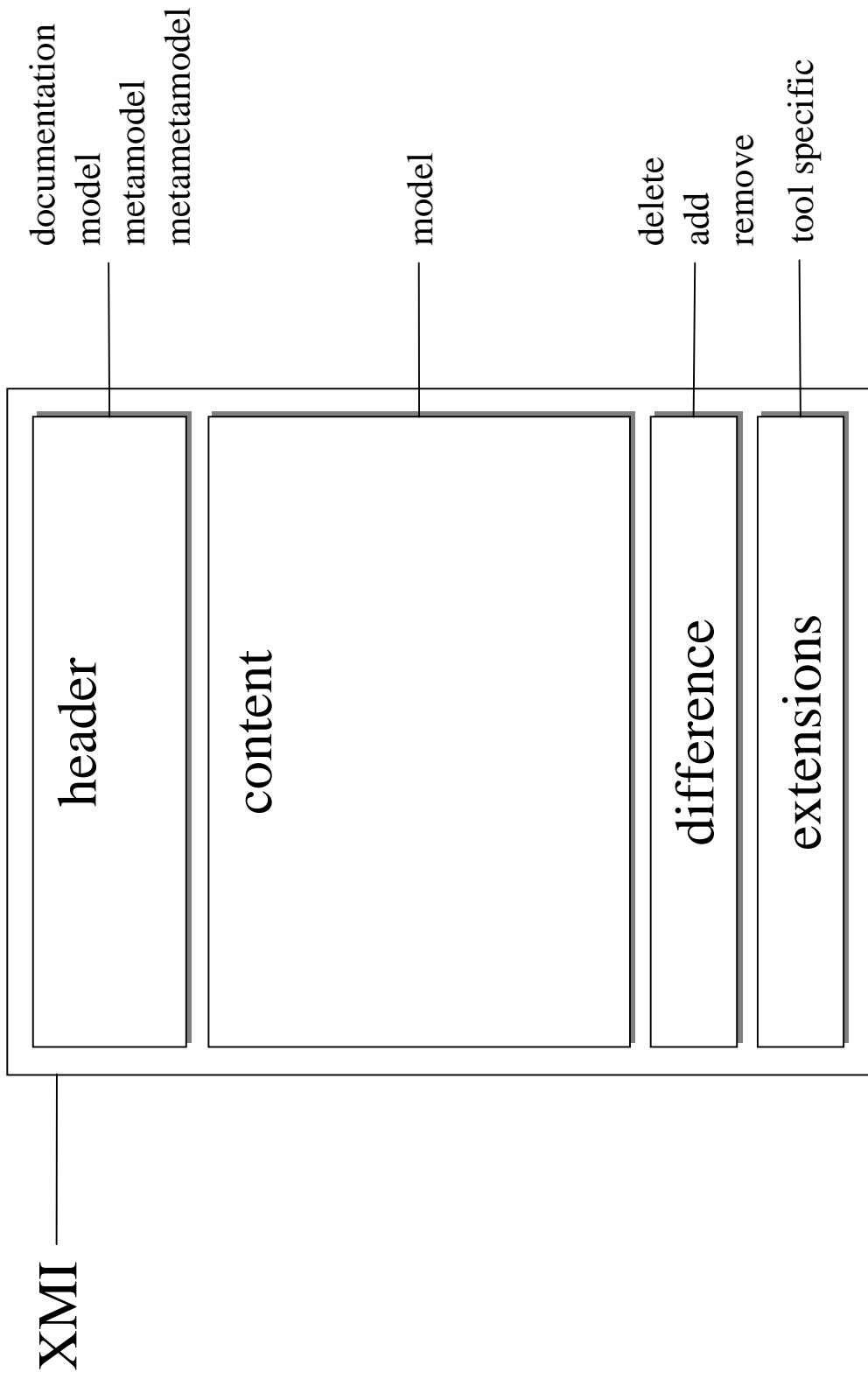


node facts

arc facts



Document overview : XMI



Conversion steps

- Instantiate the ASG
 - read ASG file
 - create ASG instance
- Transform the ASG instance
 - normalize directory and file structure
 - add extra primitive types
- Output XMI
 - preprocess ASG
 - emit XMI file



Instantiate ASG

- Read the ASG file
 - ANTLR
 - Datrix TA grammar description
- Instantiate the ASG
 - ASG instantiation classes



ASG instantiation classes

DatrixASG
nodes root
getRoot() getNode(id) addNode(node)

DatrixASGNode
attributes inArcs outArcs
getType() setType(type) getID() setID(id) getOutArcs() getOutArcs(arcType) addOutArc(arc) deleteOutArc(arc) getInArcs(arcType) addInArc(arc) deleteInArc(arc) getAttribute(attribCode) setAttribute(name, value)

DatrixASGArc
attributes
getType() setType(type) getSource() setSource(node) getTarget() setTarget(node) getOrder() getAttribute(attribCode) setAttribute(name, value) removeSelf()



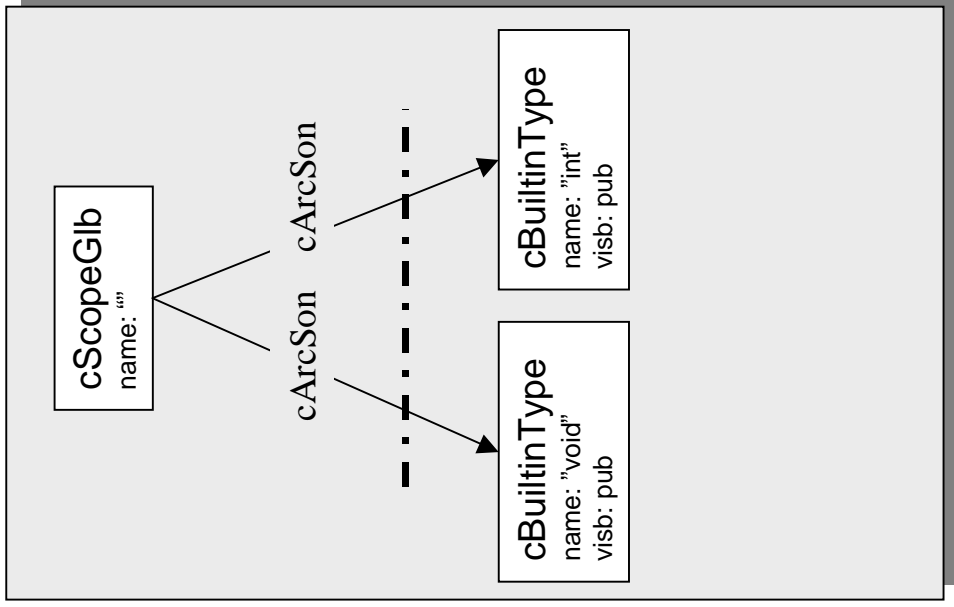
Transform ASG

- Normalize directory & file structure
 - model physical layout of directories and files
- Add new primitive type
 - VA_ARG_LIST

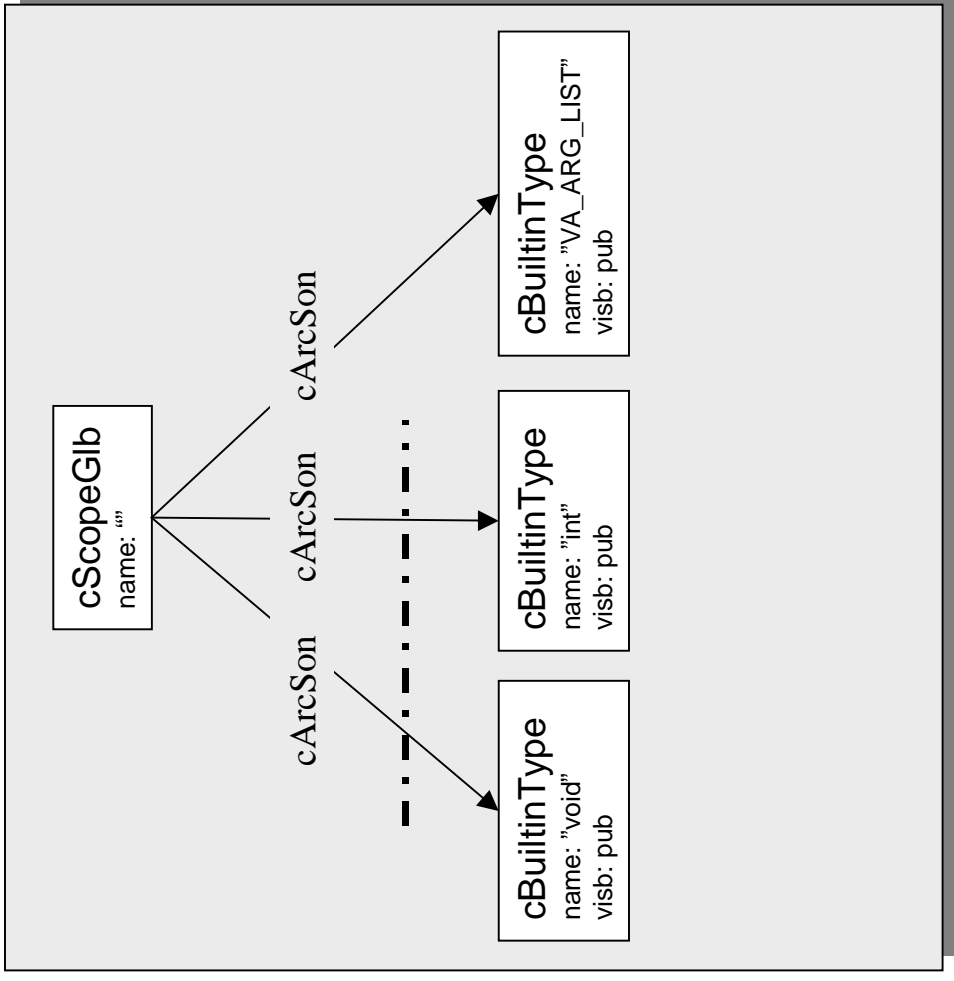


Transform ASG: primitive types

BEFORE

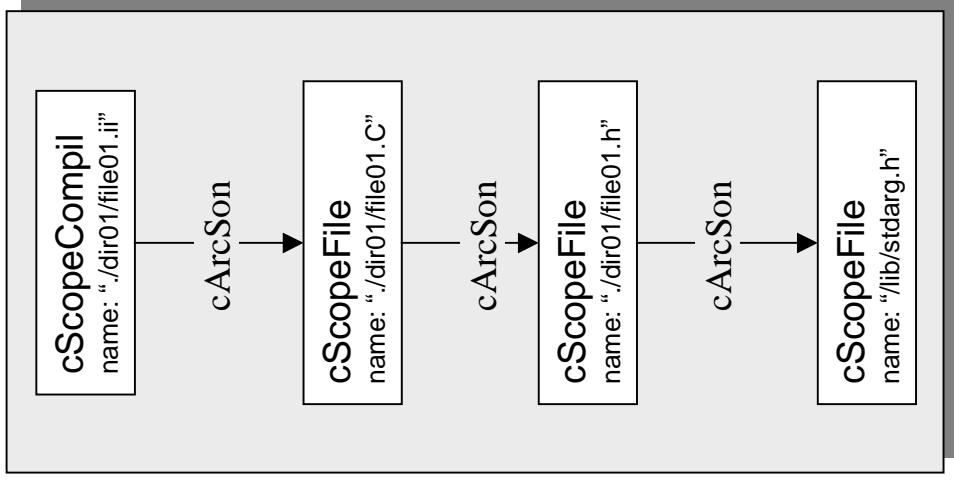


AFTER

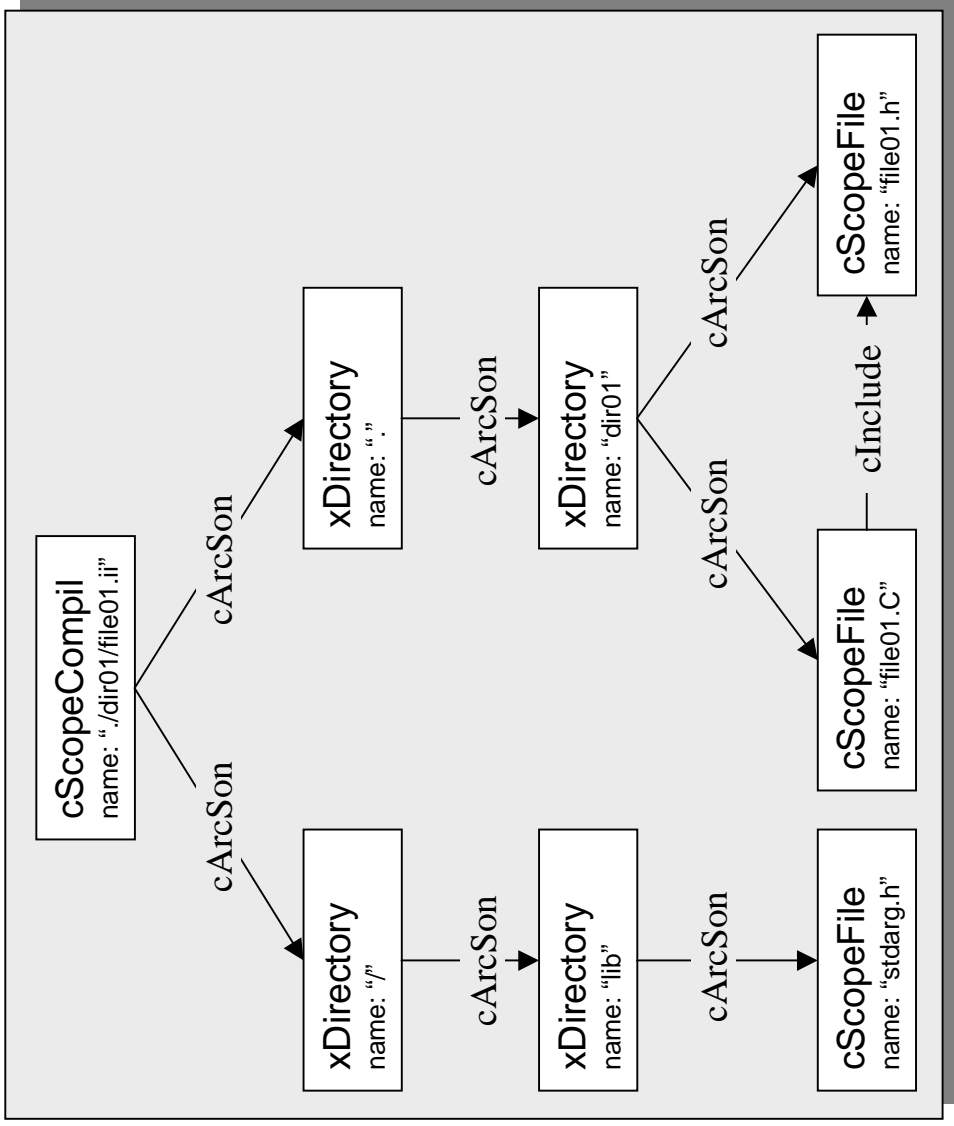


Transform ASG: directories & files

BEFORE



AFTER

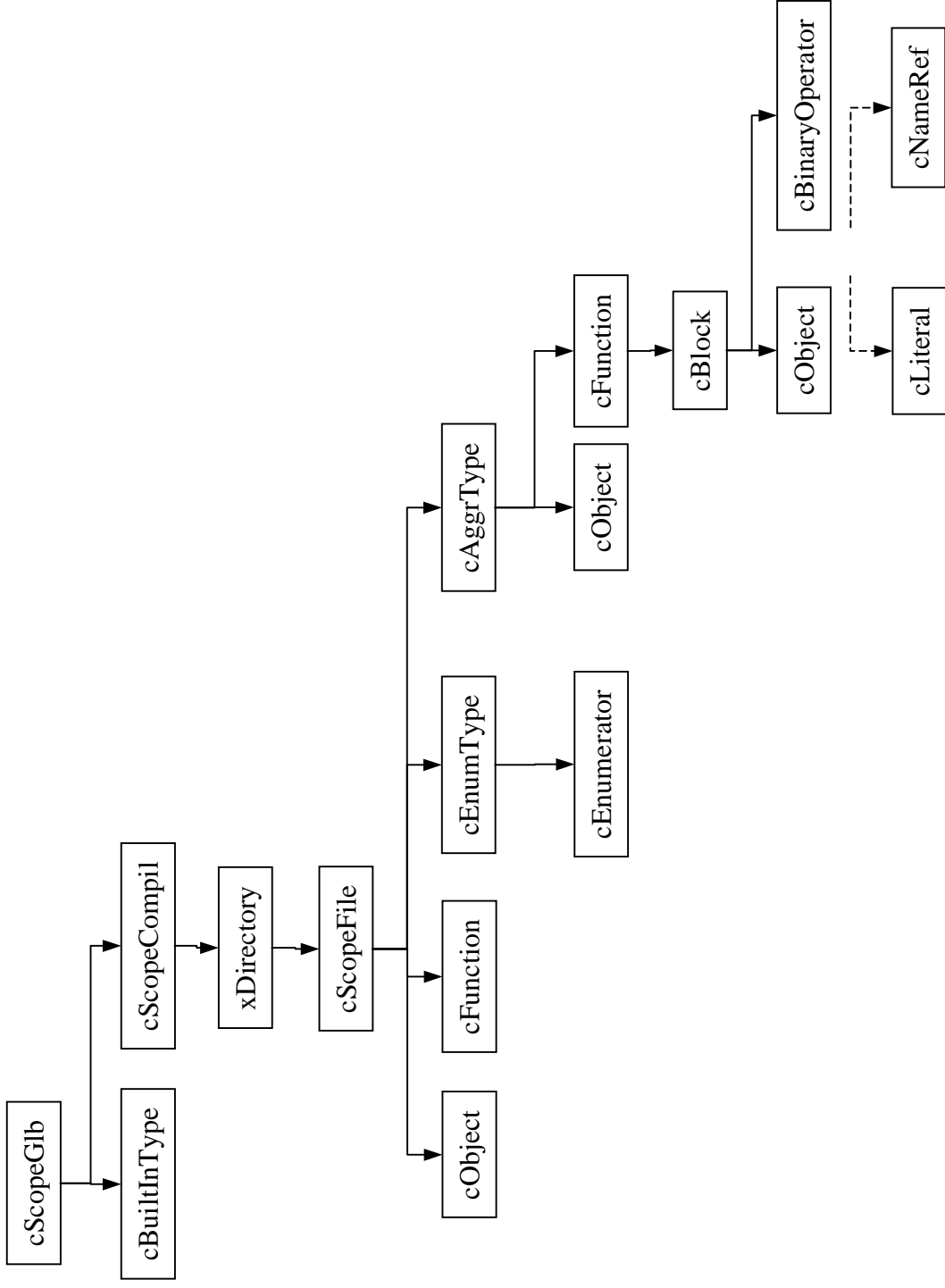


Output XMI

- Preprocess ASG
 - types
 - element IDs
 - symbol tables: scopes, identifiers
 - function definitions
- Emit XMI file
 - XML & XMI headers
 - XMI content
 - XMI footer



Emit XMI file: XMI content



Conclusions

- Most difficult
 - schema to schema mapping
- Key to success
 - complete and accurate specifications
- Wish list
 - converters, readers, schema API, grammars
 - “complete” schema (???)
 - “complete” test suites for sanity checks



Links

SPOOL	http://www.iro.umontreal.ca/labs/gelo/spool/
Datrix	http://www.iro.umontreal.ca/labs/gelo/datrix/
TA	http://plg.uwaterloo.ca/~holt/papers/ta.html
ANTLR	http://www.antlr.org/
Grammars	http://www.antlr.org/resources.html
UML	http://www.omg.org/technology/uml/ http://www.cetus-links.org/oo_uml.html
XMI	http://www-4.ibm.com/software/ad/standards/xmi.html
XML	http://www.w3.org/XML/ http://www.oasis-open.org/cover/sgml-xml.html
Java	http://java.sun.com/

