TEAM 3.0 - Managing LCA Information Within an Enterprise Setting

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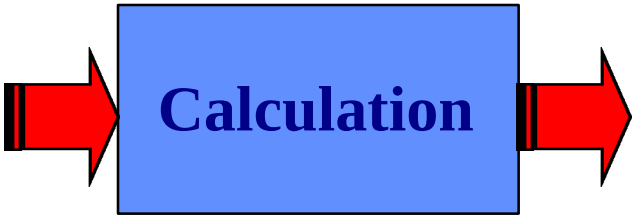
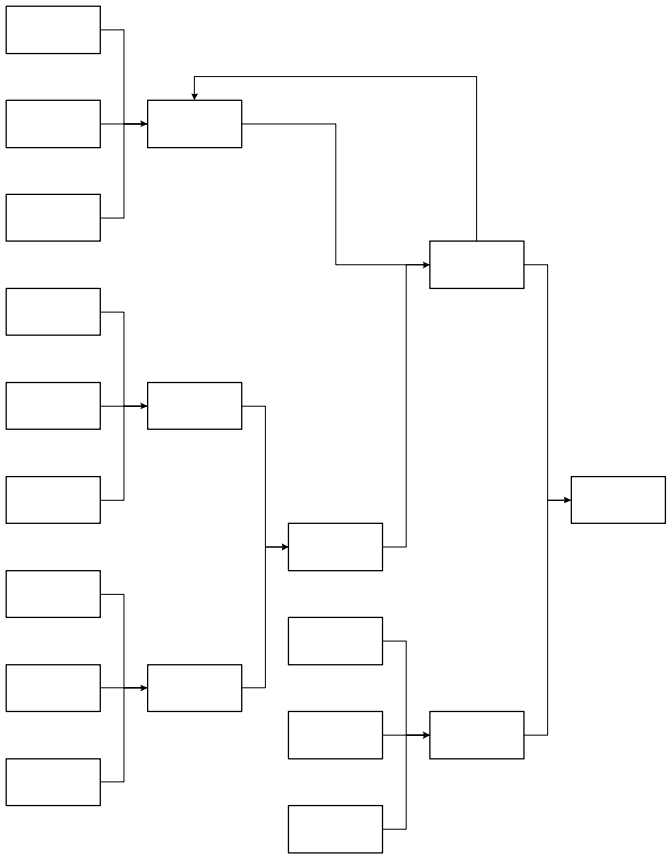
LCA Operational Framework

Data acquisition



Results analysis and interpretation.

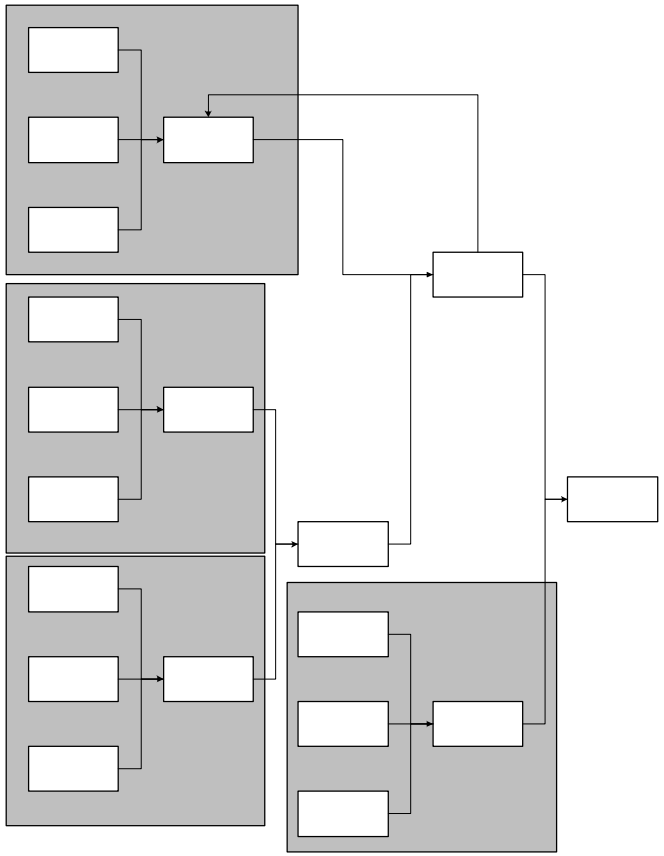
Data Acquisition - Historical Practice



- Academic practice
- Custom spreadsheet-based tools

⇨ little automation / re-use of data

Data Acquisition - Historical Practice



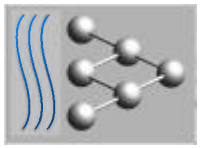
- **Emergence of LCI databases / building blocks**
- **Industry practice**

⇨ **Still highly manual**

Data Acquisition Challenges

- **External databases**
  - **Comparability/Transparency of different data sets**
    - Grade
    - Applicability
  - **No single format for exchange**
- **Internal databases**
  - **Information resides in multiple databases**
  - **Allocation issues**

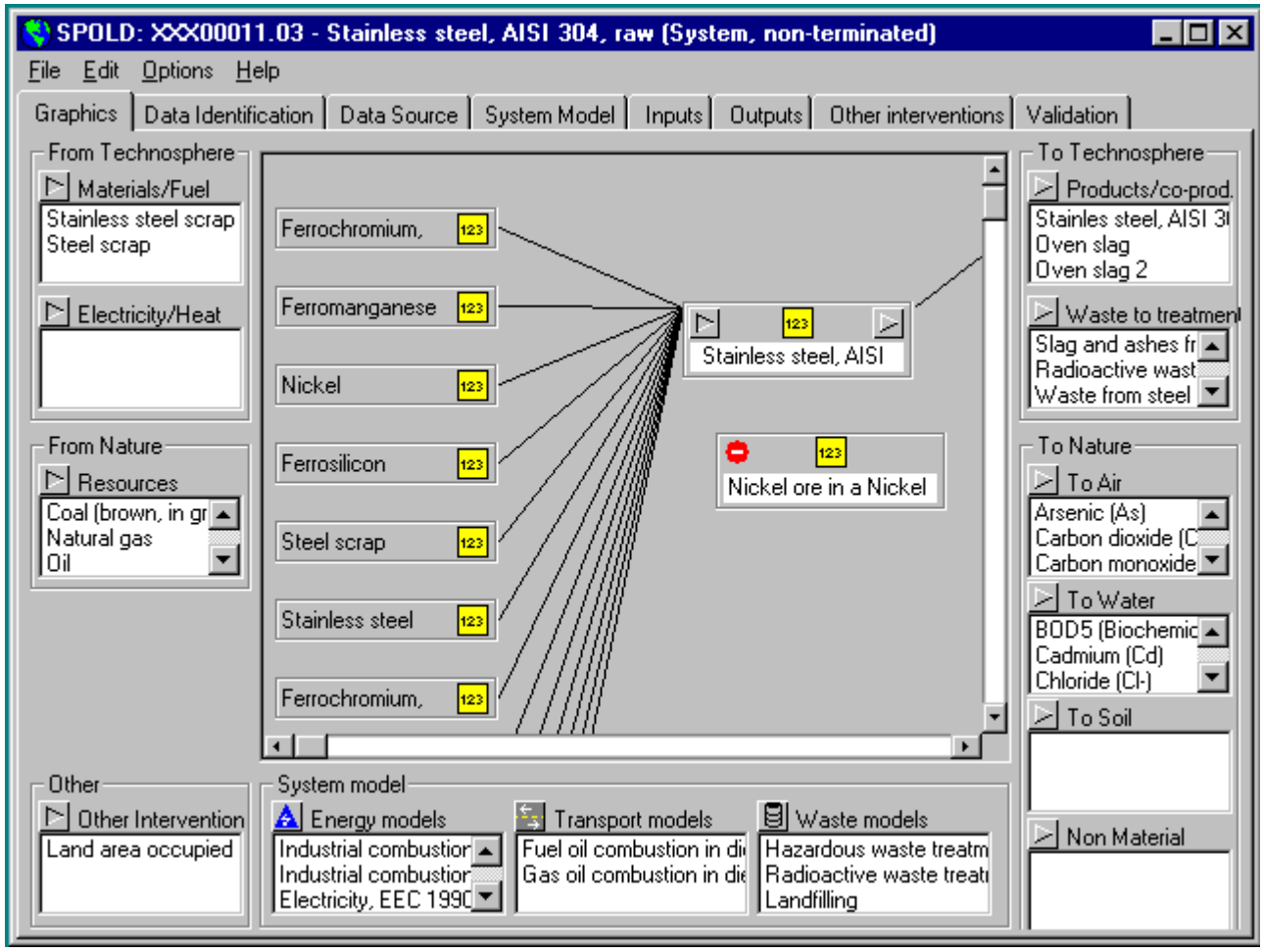
External Databases Initiatives



- **Exchange format:**
  - **SPOLD 97-99**
  - **SPINE**
  - **STEP**
  - **XML**
- **Data directory/exchange initiatives**
  - **SPOLD SIS**
  - **US EPA LCAccess**

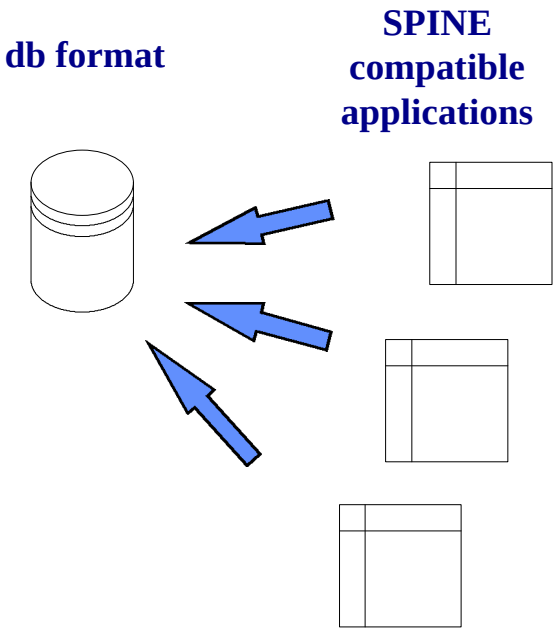
⇨ **Crucial need for consistency**

SPOLD Format Software : Example

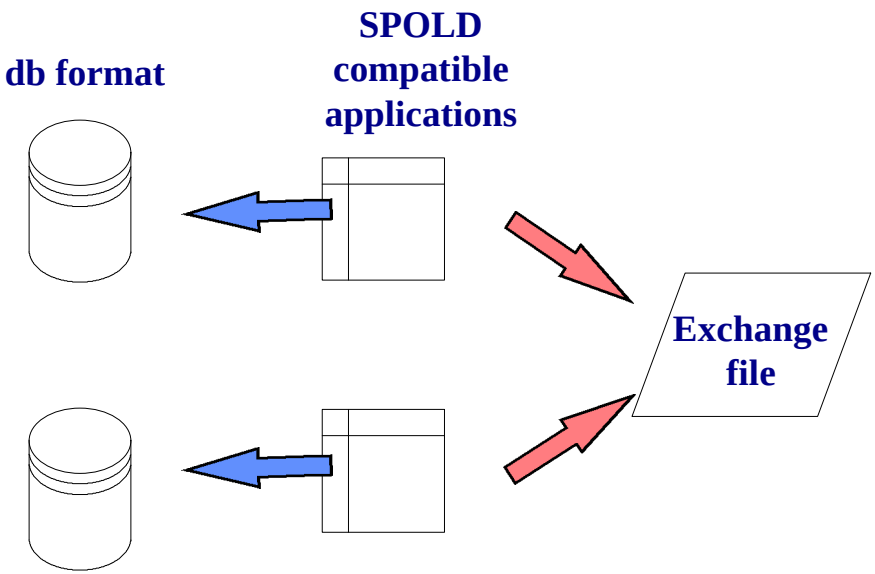


Comparison of approaches

SPINE



SPOLD



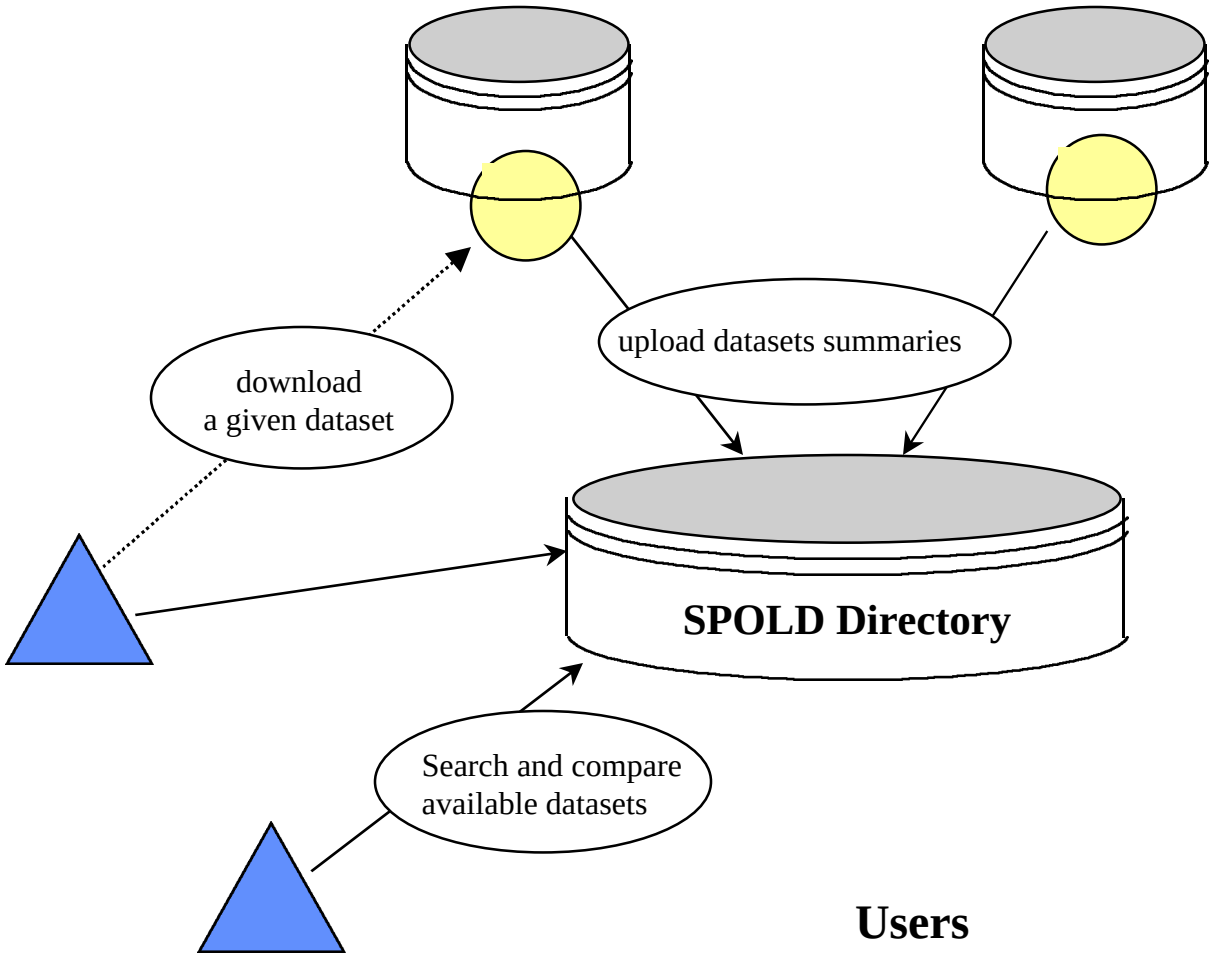
Advantages - Disadvantages

- **SPINE:**
  - Open database format
  - Constraints on the database storage
  - A few existing programs are using the database format (Northern European market)
- **SPOLD:**
  - Exchange format
  - No constraints on the software development (Object-Oriented Database vs RDMS, etc ...)
  - Vendors in Europe scheduled to offer within months a SPOLD exportation-importation
- **SPOLD and SPINE are not:**
  - A questionnaire for data collection
  - A calculation tool.

STEP

- ISO Standard 10303 on data description
- Should facilitate concurrent engineering
- Mature technology (CAD software)

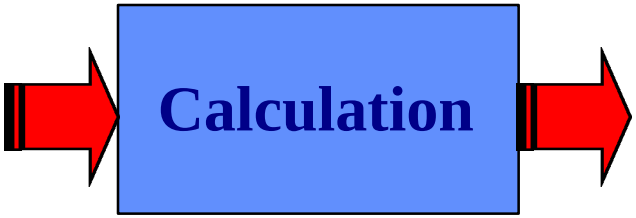
⇨ New player: XML (eXtensible Markup Language)



SPOLD Information System Architecture

LCA Operational Framework

Data acquisition



Results analysis and interpretation

Results interpretation

- **Increased sophistication of outputs**
  - **Availability of numerous LCIA methods**
  - **Uncertainty analysis**
- **Usefulness directly related to an increased effort in data collection:**
  - **Speciated flows**
  - **Range and distribution of inputs**

Integration

- Need to expand the spread of LCA information beyond LCA experts
- Ability to separate roles:
  - LCA experts: model building, data collection
  - Other users: ability to drive overall results through simple control panels
- Ultimate integration: LCA software as a software object component
  - Example: MIT's DOME project

DOME Project:

Product development service marketplace

- Develop technology so participants can define *Internet-based service interfaces* to their expertise and simulations, thereby making appropriate services available on demand while protecting proprietary knowledge.
- Develop technology so services from *heterogeneous sources* can be mathematically linked by participants to form a decentralized network of local relationships

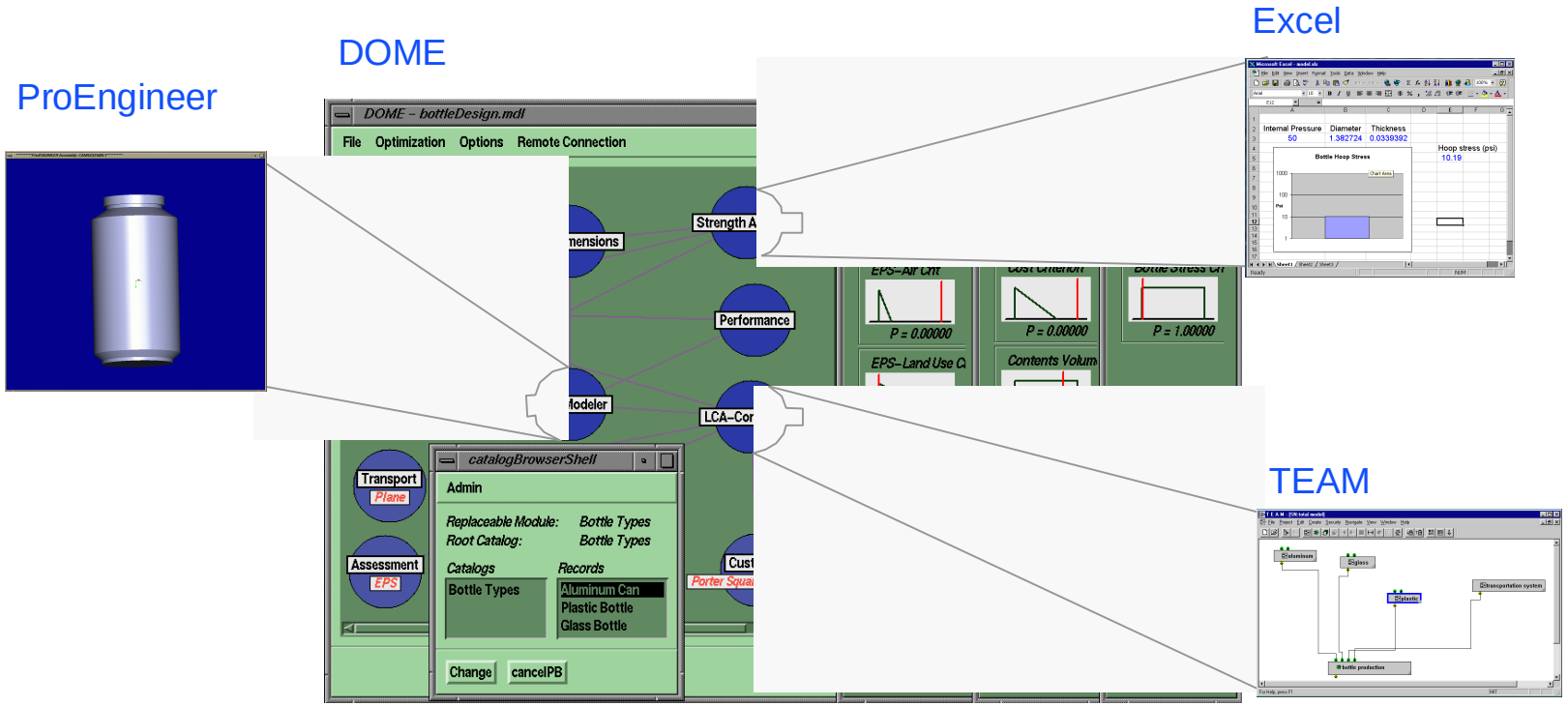
Environmental Assessment: Goals

- Integrate environmental expertise into product design
- Perform real-time life-cycle assessment (LCA)
- Explore environmental impacts of design changes
- Evaluate environmental impact and product performance tradeoffs
- Support informed decisions

Environmental Assessment

Integrated bottle design model

◆**Linking of engineering design models and life-cycle models using DOME allows real-time environmental assessment and integrated performance tradeoff analysis**



Conclusion

- **Major improvements in the LCA operational framework**
  - **Largely outside LCA software programs**
  - **Related to the data acquisition infrastructure:**
    - Internet directories
    - Exchange format
  - **Related to the full integration of LCA within the enterprise information system**