i2 Solution Discussion for NEMI MCD Workshop

Aug. 30-31, 2004

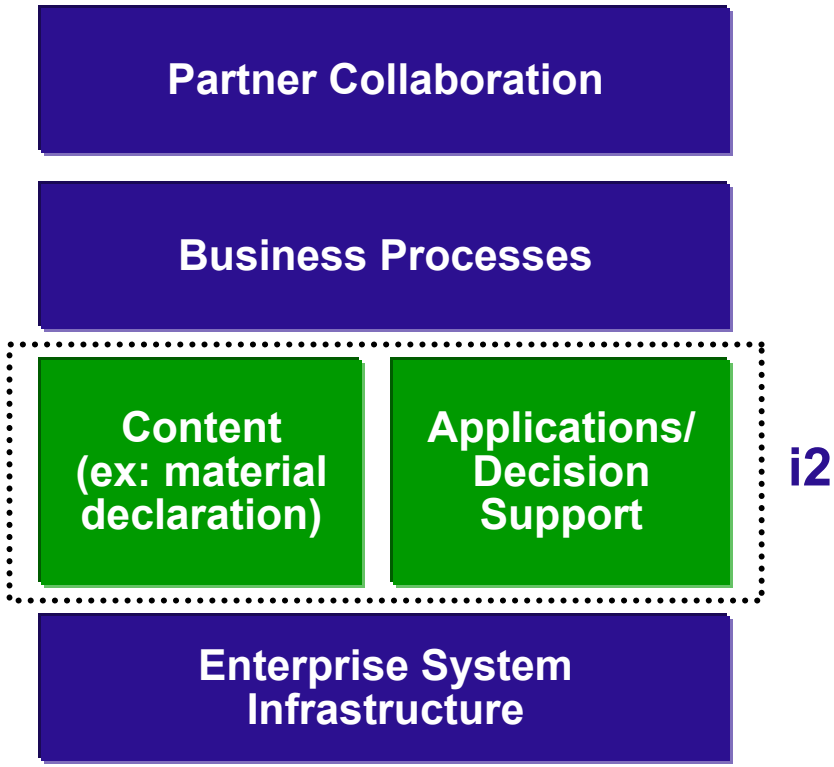
i2 Solution Focus

Lead-Free and Environmental Regulations (ex: RoHS)

Product Regulations

- **CSM and Content Management**
  - Manage item/supplier & related data
  - Data/system integration, input/output
- **Design**
  - Decision support
    - Search, DfE, DfM, change mgmt, etc.
  - Analyze product compliance vs. environmental requirements (e.g., RoHS)
  - Identify qualified, hazmat-compliant parts
- **Sourcing & Procurement**
  - Adapt sourcing processes & expand IT capabilities to address hazmat strategy
  - Supplier performance management for environmental factors
- **Reporting and Traceability**

Focus is Discrete Manufactured Product



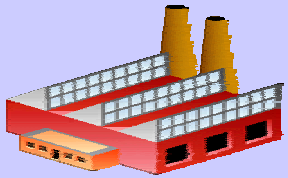
- **Analytical solution based on quantitative data**
- **Integrated with existing business processes and systems**
- **Decision support system**

i2 Content
Offering a Hazmat Content Database

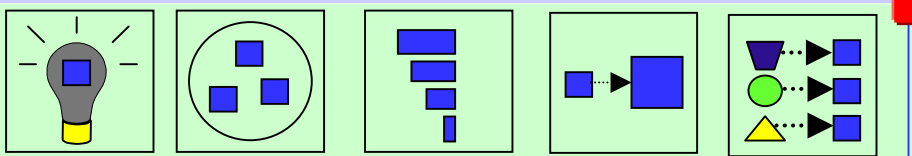
Phase 1: Initial Content Processing

Sourcing

- Product Change Notice
- Last Time Buy
- Life Cycle Information
- Hazmat



ISO 9001 Certified Process



i2 Electronics Database

Customer-Specific Parts

- Customer defines parts & priorities
- Work can be spread over time (phases)
- i2 responsible to source & produce
- i2 provides electronic data/updates

Phase 2: Sustaining Content Processing

Subscription Database
Based on i2 Experience with 12 million part Electronics Database

Hazmat Content – Core Attributes

Common subset requested by most OEMs

i2 Hazmat Core Substances		
Restricted Material / Substance	**Total Weight**	**Maximum Concentration**
Lead	mg	ppm
Cadmium	mg	ppm
Mercury	mg	ppm
Hexavalent Chromium	mg	ppm
Polybrominated Biphenyls (PBBs)	mg	ppm
Polybrominated Diphenyl Ethers (PBDEs)	mg	ppm

i2 Hazmat Core Attributes	
Related Attributes	**UOM (or valid values, examples)**
Disclosure Date	Date
RoHS-Compliant by virtue of thresholds	Yes/No
RoHS-Compliant by virtue of exemption? (specify)	No/<specific exemption>
Item Weight	mg
Manufacturing	
Terminal/Contact Finish	SnPb, NiPdAu, SnAgCu, Sn
Peak Reflow Temp.	° C
Time @ peak reflow temp.	seconds
MSL @ peak reflow temp.	1, 2, 2a, 3, 4, 5, 5a, 6
Replacement Part	
Recommended RoHS-compliant replacement part	<manufacturer part number>
Planned availability of replacement part	quarter and year
Actual availability of replacement part	Date
Method of distinguishing replacement part vs. original	Part Number/Date Code/Other
Date Code of Compliant Part (when MPN are same)	<Date Code>

Often extend to add additional attributes and materials per specific customer requirements

3rd party vendor offers impartial due diligence, proven level of high quality data processing

Application Use Models

IT support for Design Engineering

Hazardous Materials Management

Enterprise Integration → Content Mgmt → CSM → Design for Environ-ment → Other DfX & Decision Support → Reporting & Trace-ability → Supply Mgmt

- BOM import, setup (parts, AMLs)
- Material data input
  - Partial or full disclosure
- Manufacturability data input
- Supplier collaboration (data)

- Item/supplier master data mgmt
- Preference mgmt (PPLs, AVLs)
- Part cross-referencing
  - Ex: lead-free version of legacy lead-based part
- New part/supplier intro process
  - Request, qualify, approve
  - Check for hazmat and manufacturability constraints

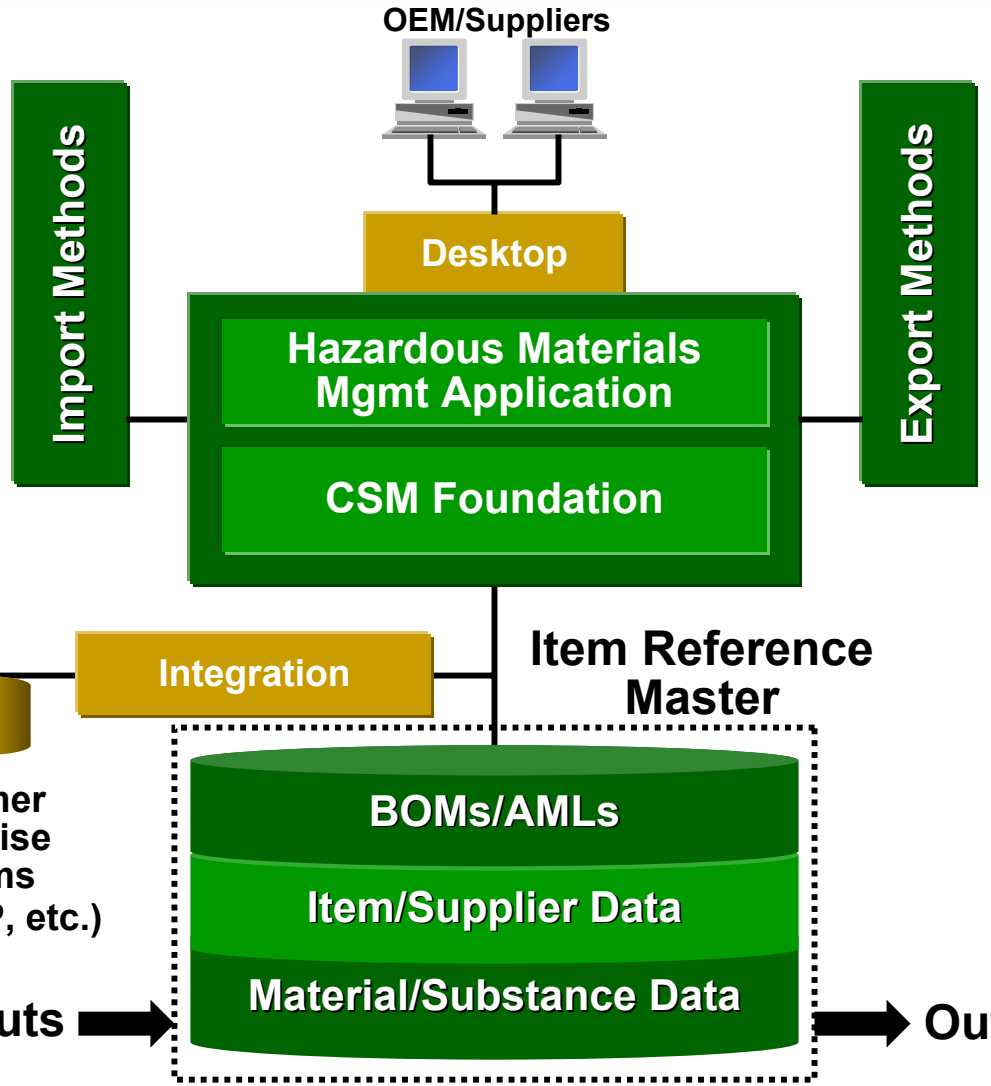
- Part search, compare
  - Evaluate hazmat characteristics
  - Evaluate manufacturing data
- BOM analysis
  - Environmental compliance
  - Constraints-based auto analysis
  - Part lifecycle status/prediction
  - Manufacturability
- Change/alert mgmt
  - Impact assessment
  - What-if analysis

- Data population statistics
- Material declaration
- Manufacturability

i2 Hazardous Materials Management (HMM)

Solution Footprint

- Forms-based data entry (browser)
- Structured flat file
- Excel template
- XML
- i2 Hazmat content



- Reports
- Structured flat file
- Excel
- XML
- Joint Industry Guide
- PDX 1.0

Near Future Support:

- JGPSSI spreadsheet
- PDX 2.0

i2 Solution Value-Add

- **Flexible, Extensible**
  - Supports any level of disclosure
    - Yes/No, RoHS, JIG, Full disclosure
  - Can be extended to support customer-specific data requirements
    - Ex: WEEE & Mfg attributes
- **Scalable**
  - Built on CSM foundation proven to support 10s of millions of item-related data records
    - Deep technical content
- **Robust**
  - Any dimension of item-related data
    - Technical, business, manufacturing, quality, environmental, lifecycle, etc.
  - Part, supplier and schema cross-referencing to support any need
- **Integrate-able**
  - To any enterprise system
  - All data elements linked together
- **Use model support (environmental)**
  - Engineering
    - Search, decision support, analytics, change mgmt
  - Sourcing & Procurement
    - Spend analysis, supplier mgmt, RFx, Contract Mgmt, etc.
  - Reporting, traceability
- **Complete**
  - Content + Software + Consulting/IT Services
- **Proven**
  - More than 100 Global 2000 CSM customers since 1991