Business Intelligence for the Real-Time Enterprise (BIRTE)
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Roundtable panel discussion
"How real can real-time business intelligence be?"

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Some **Intelligence Community** Challenges:
• “no inter-agency system exists to rapidly integrate broad data sets.”
• “… models … need to be integrated seamlessly.”

* “Intel” and “IC” not Intel Corp and Integrated Circuit

Problem:
• Feasible to solve (manually) when stable and only 3-4 data sources and 2-3 models
• But, if grow to many data sources and models – becomes major effort
  • Hard to scale to large number of sources and models
  • Hard to change (to incrementally add new sources and models)
  • Hard to evolve (changing specifications of existing sources and models)
  • Hard to automate the integration and maintenance

Many similarities to Business Community
Q: “Russia just suspended payment of its debts… How much do we have at risk?”
Data Transformation & Integration for BIRTE
– Hypothetical Example

Raw Data Sources ➔ Semi-Processed Data Sources ➔ Specific Data Needed for Each Model

- Web sites
- Newspapers
- Databases

Some Data Extraction can be Automated via COIN Technology

Civilian casualties (per day)
Military casualties (per day)
Civilian casualties (per week)
Military casualties (per week)
Individual Economic Sector Performance (in Euros)
Total Economic Sector Performance (in local currency)

Data Transformation & Integration Automated via COIN Technology

Interesting challenge, especially with time series data, is that semantics change over time – e.g., currency in France changed from Francs to Euros; Yugoslavia changed several times. COIN handles this easily as part of its temporal semantics capabilities.

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Model Input/Output Transformation & Integration – Hypothetical Example

The automation of model integration – especially to deal with many autonomous evolving models, with differing input/outputs, is an important technological advance needed.

1 Many more subtleties to data semantics, such as differing definitions of what is a “casualty” in different data sources and as used in different models - that must be reconciled.
Simplified Overview of COntext INterchange (COIN) Advanced Technology

Concept: Time
Modifiers: Days, Weeks

f()

Shared Ontologies

Conversion Creation

Source Context

Select civ_casualties / 7
From source1
Where region="12"

Receiver Context

Select civ_casualties
From source1
Where region="12"

Context Mediator

Declarative description of Source’s actual semantics

Declarative description of Receiver’s desired/expected semantics

Light-weight Ontologies with Context Modifiers

Specialized symbolic equation solving techniques used to dynamically create comprehensive conversion programs from small conversion components

Mediation & Transformation uses an integrated framework of abductive and constraint logic programming