

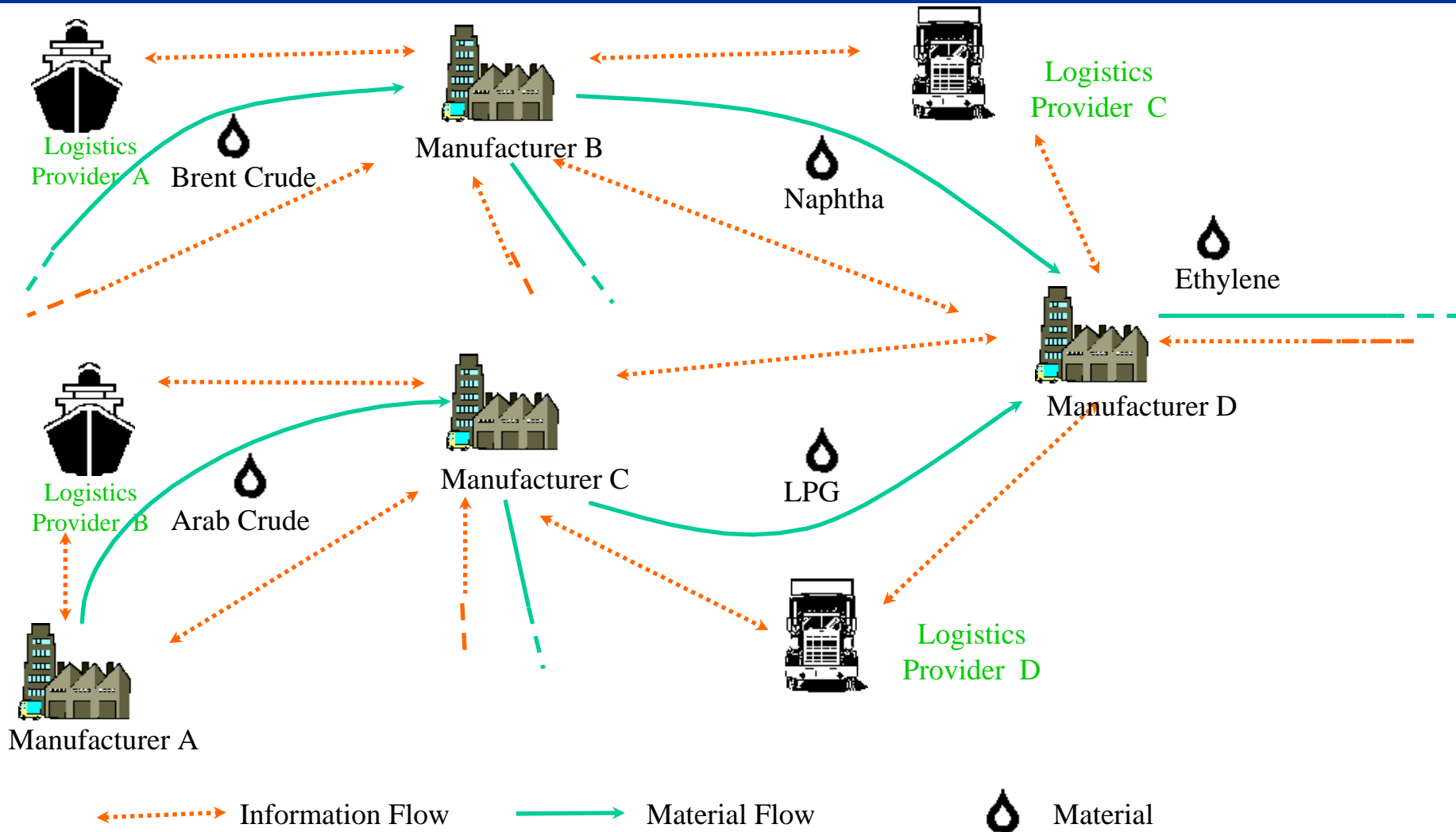
Multiscale Simulation of Supply Chains using Computational and Access Grids

Raj Srinivasan
National University of Singapore

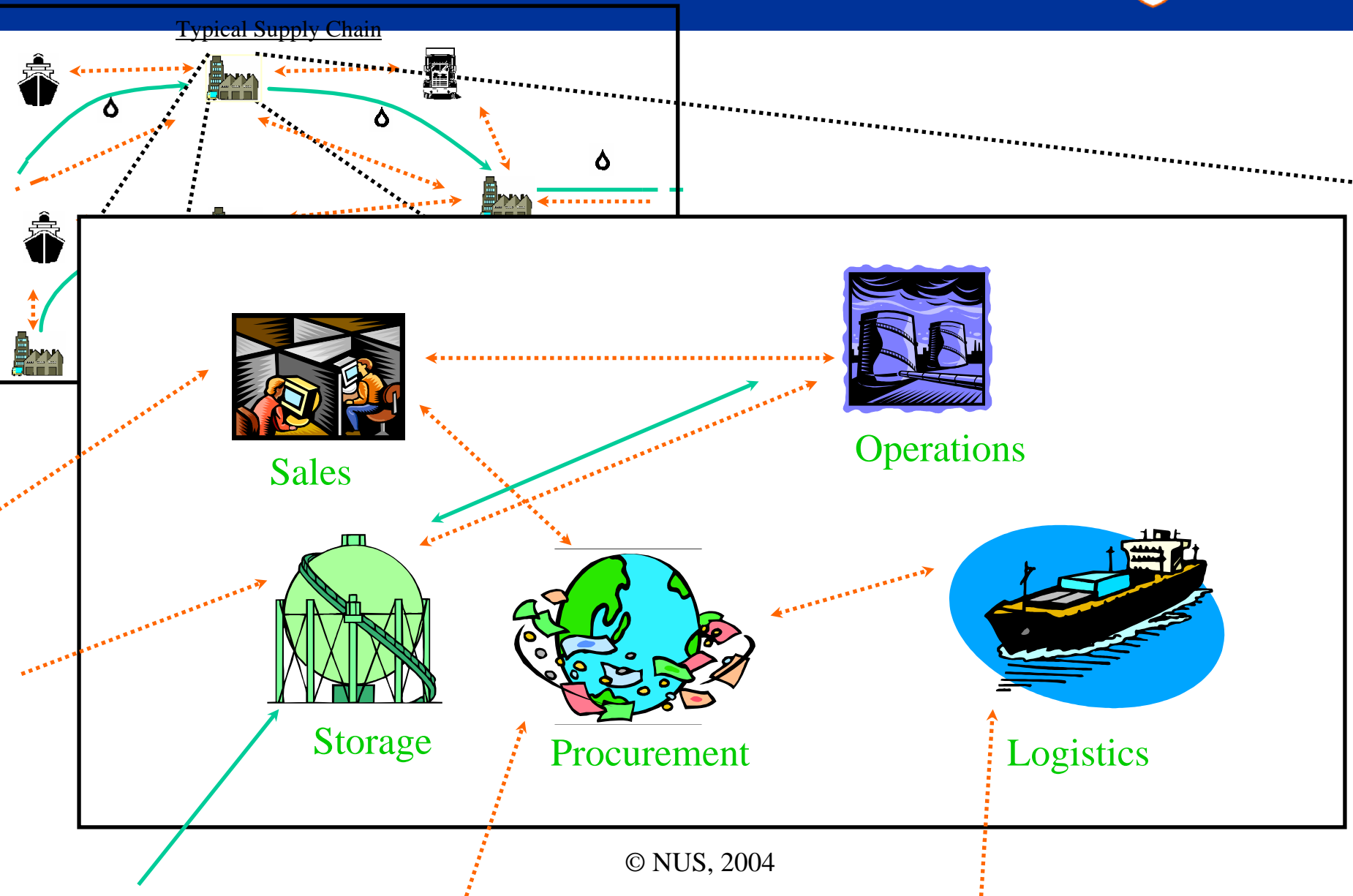
Dongil Shin
Myongji University

16 Jul, 2004

Refinery Supply Chain



Business Processes of a Refinery



- Model and emulate refinery supply chain using an agent-based approach
 - Players/entities & their dynamic relationships
 - Dynamic stochastic SCM scenarios
- Develop a Decision Support System (DSS) and illustrate application on a model refinery
 - Proof-of-concept prototype

Agent-based Approach

Intelligent software agents

- ✓ Emulate supply chain entities (oil suppliers, sales, procurement, electronic exchanges)
- ✓ Act as operators
- ✓ Capture business processes, rules and policies

+

Object-oriented methodology

- ✓ Model non-functional units (business data, communication, materials)
- ✓ Act as operands
- ✓ Capture business data and information

= **Knowledge Representation**

- Inscribe business processes in agents using grafccets
- Agents communicate with each other and simulate material and information flow by exchanging messages
- All actions and messages with details are stored in a database for post-run analysis

- Configure “what-if” scenarios
- Select & deploy agents
- SC simulation begins from some pre-defined steady state
- Simulate various scenarios
- Analyze via user-defined KPIs