xj technologies

AnyLogic:
Multi-Method Simulation Modeling

System Dynamics Conference
July 2010
Seoul, Korea

AnyLogic® 6

What is AnyLogic?

- A unique simulation modeling tool
  - Combines all the major modeling disciplines in use today in a single high-level application
  - Massively scalable yet efficient and easy to use
  - Suitable for both simple proof-of-concept modeling as well as large-scale solution models

- AnyLogic is being selected by more and more top organizations as their tool of choice based on capabilities and value
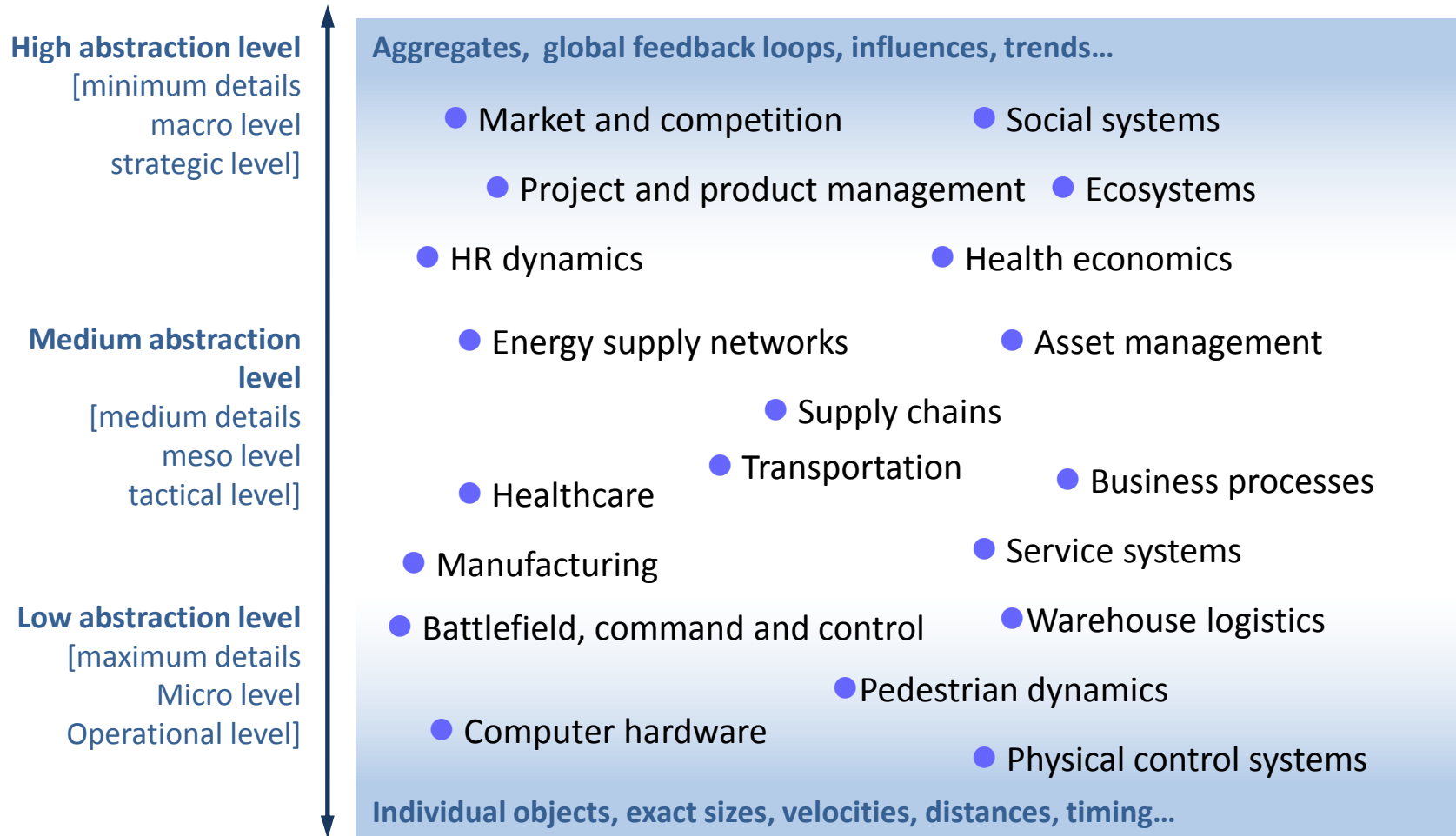
AnyLogic competitive advantages

- Develop all kinds of models with one tool
  - The only multi-method simulation tool. Develop agent-based, system dynamics, discrete-event models, or any combination, with one tool
  - Flexibility (no workarounds, choose the appropriate level of abstraction, connect to Excel, DB, ERP, CRM, use Java)
  - Develop and run on Windows, Mac, Linux: AnyLogic is cross-platform, based on industry-standard Eclipse

- Reduce model development cost and time
  - Fast high-level development without sacrificing scalability and extensibility
  - Reusability through fully object oriented structure and libraries

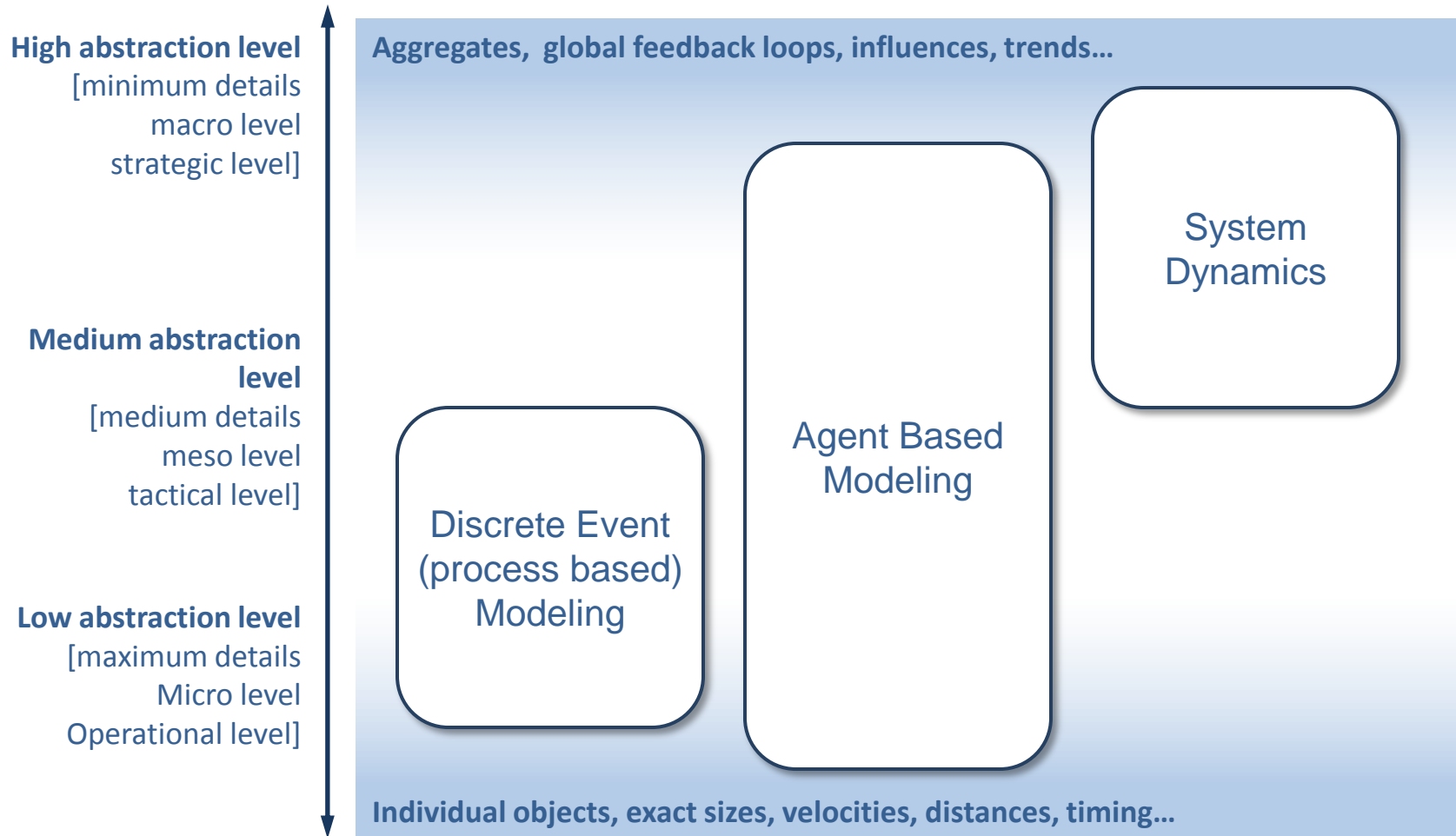- Also: visual impact of your models + superb support

# Selected commercial clients (total ~450)

Application areas

High abstraction level
[minimum details
macro level
strategic level]

Medium abstraction level
[medium details
meso level
tactical level]

Low abstraction level
[maximum details
Micro level
Operational level]

Aggregates, global feedback loops, influences, trends…

- Market and competition
- Social systems
- Project and product management
- Ecosystems
- HR dynamics
- Health economics
- Energy supply networks
- Asset management
- Supply chains
- Transportation
- Business processes
- Healthcare
- Manufacturing
- Service systems
- Battlefield, command and control
- Warehouse logistics
- Pedestrian dynamics
- Computer hardware
- Physical control systems

Individual objects, exact sizes, velocities, distances, timing…

Methods in simulation modeling

High abstraction level
[minimum details
macro level
strategic level]

Medium abstraction level
[medium details
meso level
tactical level]

Low abstraction level
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Aggregates, global feedback loops, influences, trends…

System Dynamics

Agent Based Modeling

Discrete Event (process based) Modeling

Individual objects, exact sizes, velocities, distances, timing…

Simulation modeling software

- Traditional tools are designed to support one particular modeling approach
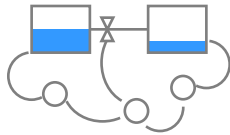
System dynamics	Discrete event modeling	Agent based modeling	Dynamic systems
VenSim PowerSim iThink	Arena ExtendSim SimProcess AutoMod PROMODEL Enterprise Dynamics FlexSim …	[Academic tools:] Swarm RePast NetLogo ASCAPE	MATLAB VisSim LabView Easy5 …
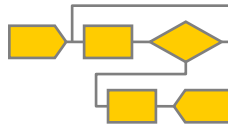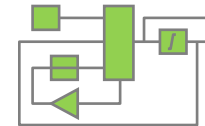
AnyLogic – multi-method simulation tool

Dynamic systems

System dynamics

Agent based modeling

Discrete event (process based) modeling
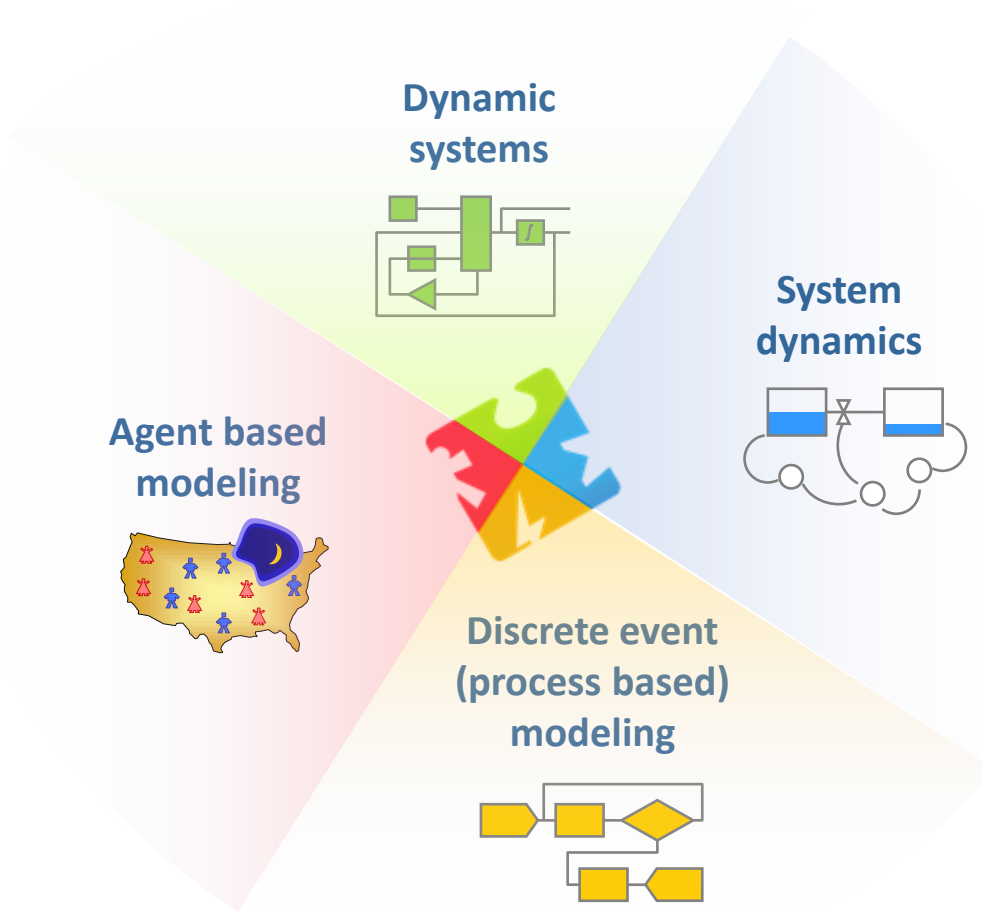
- Easy to choose and adjust the abstraction level

- Can switch between different methods

- Can mix methods in one model

- Modern and flexible OO platform

Example: Restaurant Business Model

- Two restaurant groups compete in a local area.

- Every day at 7PM people decide where to go for dinner.
  - If there are no restaurants within a certain range, they eat at home
  - Otherwise they choose a restaurant based on both distance and "image" created by advertizing.
  - The restaurants have limited capacity and people check if they can make a reservation

- The finances are centrally managed at a restaurant group level
  - Each restaurant has fixed running cost
  - On average, a person spends $40 at a restaurant
  - A certain percent of accumulated capital is spent on advertizing

- The model architecture is multi-method:
  - People, restaurants, and restaurant groups are modeled as agents
  - The money flows within a restaurant group are modeled as a system dynamics diagram

- Each group exposes a management dashboard where you can open or close a restaurant, and decide how much money should be invested into "image"

Restaurant Business screenshots – design time
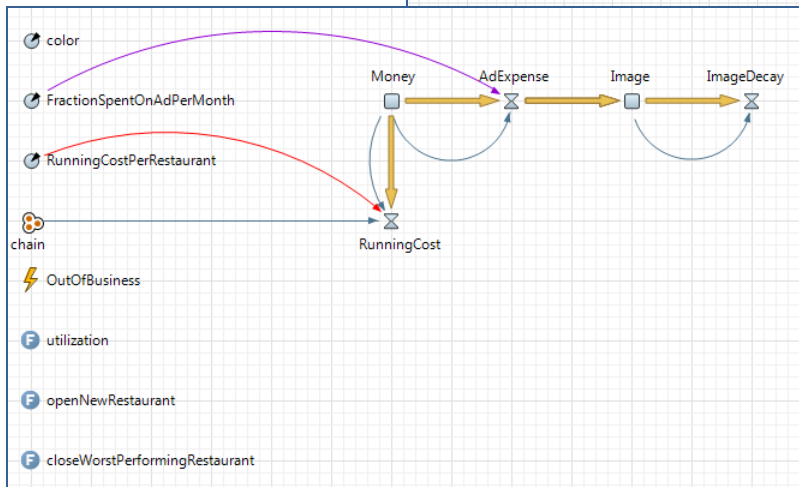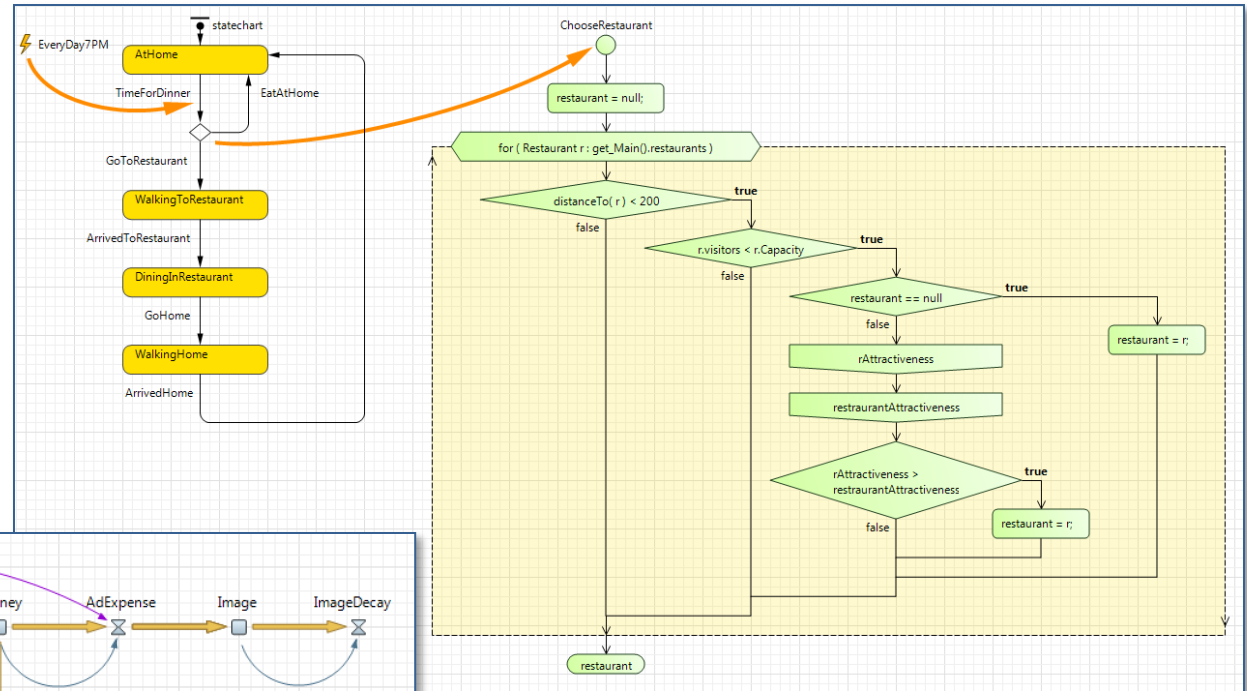
Restaurant Business screenshots – runtime
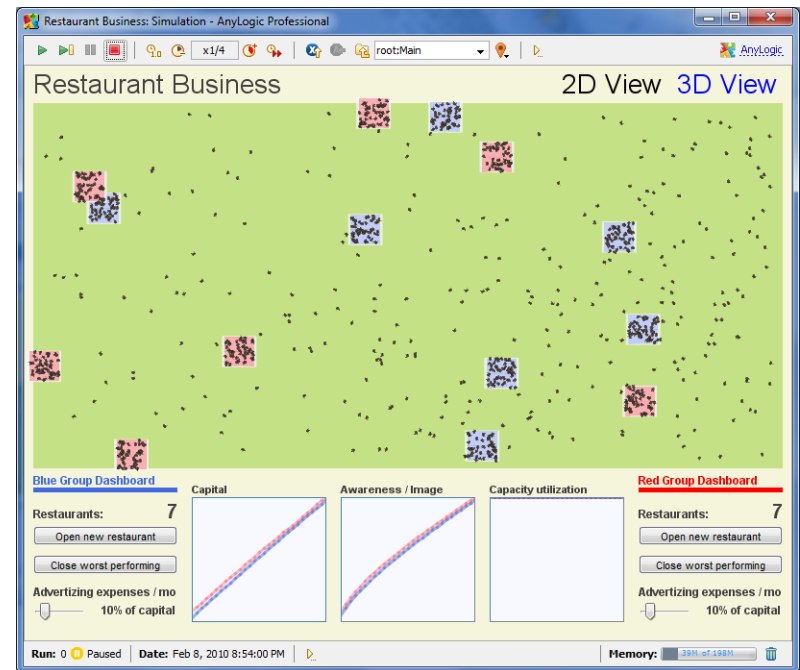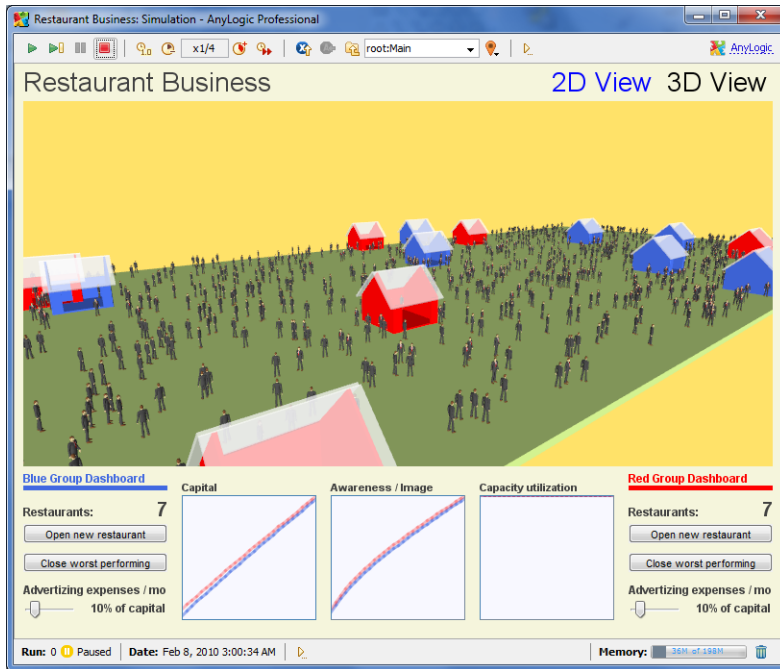
Thank you!

- Questions?

- Contact us: www.AnyLogic.com