

# Knowledge-based Support in Simulation Games

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ISAGA 2006, St Petersburg

## Agenda

- Introduction
- Knowledge and Scenarios
- Scenario generation and management
- Game run support
  - Search engine
  - Feedback
- Future works

## Introduction

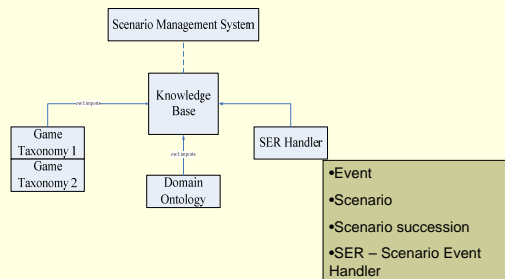
- Simulation game as teaching tool
  - Learning concepts
  - Enriching scenarios
  - Timely feedback
- MAGNUS
  - <http://magnus.comp.nus.edu.sg>

## Knowledge and Scenarios

- Knowledge
  - Domain concepts
  - Simulation/game concepts
  - Relationship
- Scenarios
  - Powerful pedagogy object
  - Information rich storylines
  - Induce reflective learning

## ScenGen

- A scenario management system



## ScenGen

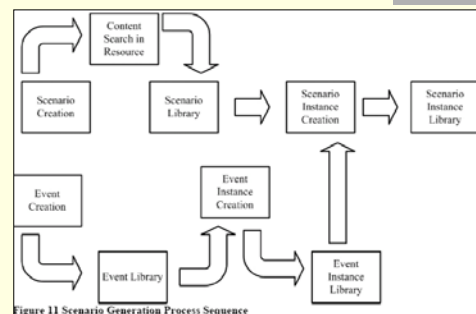


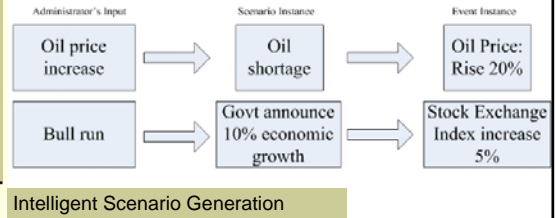
Figure 11 Scenario Generation Process Sequence

## ScenGen

The screenshot shows a web form for creating a scenario instance. The 'Name' field contains 'Indonesia demand'. Below it is a 'Scenario Description' text area with a sample paragraph about Philip Morris in Indonesia. A table below the description lists 'Subject/Concept', 'Initial Value', and 'Final Value'. The table has one row: 'Demand' with '50.0' and '890.0'. There are 'Submit' and 'Cancel' buttons at the bottom.

Scenario instance <=> Event instance

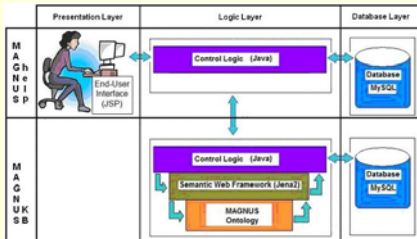
## ScenGen



Intelligent Scenario Generation

## MAGNUShelp

### A search engine



## MAGNUShelp

Concept Name	Relations	Related Concept
Plant Maintenance Expenditure	hasInverselyProportionalRelationship	Plant Depreciation
Plant Maintenance Expenditure	hasRelationshipWith	Net Profit, Cost Of Goods Sold, Total Expenditure, Cash Outlay, Plant Adjustment

MAGNUS KnowledgeBase

## MAGNUShelp

The screenshot shows the 'MAGNUS PLAYER' web interface. It has a search bar with 'MAGNUShelp Search' and a search button. Below the search bar, there are search results for 'how to plan production against market demand?'. A 'Self-navigational' button is visible on the right side of the search results.

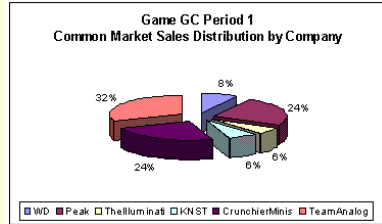
## Timely Feedback

- Anomaly detection
  - Player's input
  - Simulation outcome
- Implication
  - Error correction
  - Scenario adjustment

The screenshot shows the 'Settings for analysis' dialog box. It has several sections: 'Alerting Parameters', 'Assets and liabilities', 'Contract', 'Expenses', 'Losses', and 'Marketing and markets'. Each section has input fields and buttons for configuration.

## Regular Feedback

Market analysts have made available the attached chart:



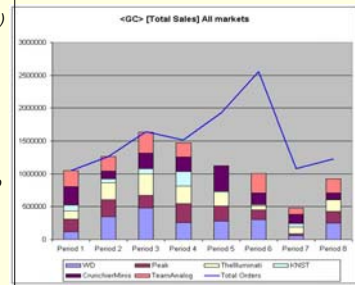
## Intelligent Feedback

Period 4  
(Threat of a labour strike)

Period 5  
(Threat subdued. Consumer spending increases.)

Period 6  
(Processing cost likely to cut due to new method.)

Period 7  
(Hurricane onslaught.)



## Future works

- Multilingual extensibility
  - Same knowledgebase, different language
- Flexibility in scenario generation
- Enhancement in knowledge base
  - Inference rules
  - Expansion in ontologies
    - Maintenance
- Enhanced feedback
  - Context-sensitive