

The Design of Intelligent Agent Supported Exception Management in Securities Trading

PhD Student: Minhong Wang Supervisor: Dr. Huaiqing Wang Co-author: Kwok Kit Wan, Dongming Xu

Research Background

Financial markets face rising trading volumes and increasing risks caused by inefficiencies in transactions.



<http://www.nysedata.com/>

80-20 rule: 80% of transactions that passed through without problems consumed only 1/5 of back-office costs, while the 20% of transactions which hit a problem consumed 4/5 of back-office overhead

Securities industry requires trade information passed within the trade lifecycle timely and accurately

What is intelligent agent?



- An intelligent agent is a computer system situated in some environment, and capable of autonomous action to meet its design objectives

- Intelligent agents enjoy such properties as autonomy, reactivity, proactivity, and social ability

- Intelligent agents are capable of dealing with distributed and complex problems

- They are applicable to business data monitoring and detecting abnormal transactions

MultiAgent systems

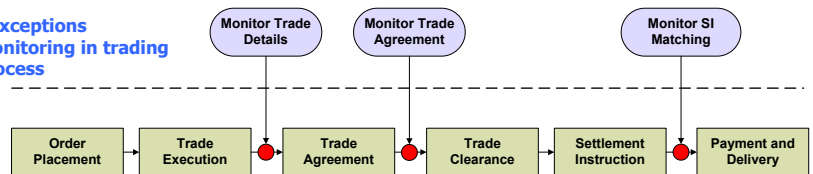
Research Objective:

With rising trading volumes and increasing risks in securities transactions, the securities industry is making an effort to achieve straight through processing to shorten the trade lifecycle and minimize transaction risk. While attempting to shorten the settlement cycle, the trade information must be passed within the trade lifecycle in a timely and accurate fashion. Exception management is critical to make sure trades that give rise to exception or trades containing errors need to be detected and reconciled in compressed timescales. In this research we are to incorporate intelligent agents into securities trading environment to provide automation and intelligence in exception resolution capability, with a view to explore the novel approach to business exception management.

Research Design and Development

• Domain Analysis

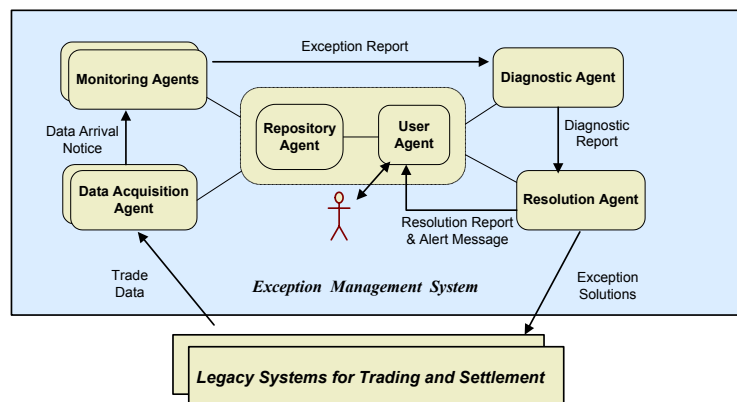
- Exceptions monitoring in trading process



- Tasks in exception management

1. Relevant data are collected for observation
2. Possible problems are highlighted
3. Nature of problems are identified
4. Actions are taken to repair problems

• System Architecture



• Future Work

- System implementation

- Build a prototype in Java environment (Java WSDP)
- Adopt Jess (Java Expert System Shell) as the reasoning engine

- System evaluation

- Evaluate the prototype by simulations and experiments

Contribution

- Develop a multi-agent system for exception management in securities trading
- Investigate the mechanism of agent application in business exception management

Implication

- Explore a knowledge level solution to business exception management
- Provide multi-agent supported modeling for intelligent business process management