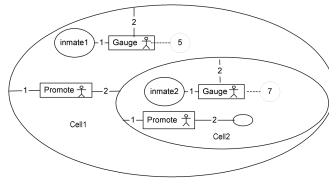


# Alternative object-oriented modeling techniques



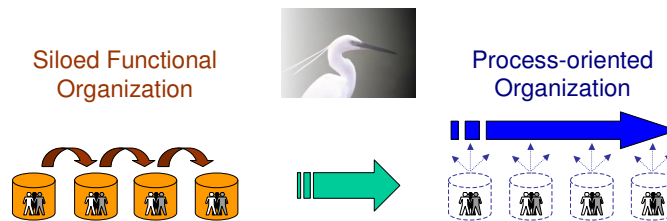
Dr. Iliia Bider, IbisSoft, Sweden



## Presentation

### 1. IbisSoft – as a consulting company

Our mission - promoting business process orientation as a way of working, and automation of business processes as a way of achieving high productivity and quality in administration and management

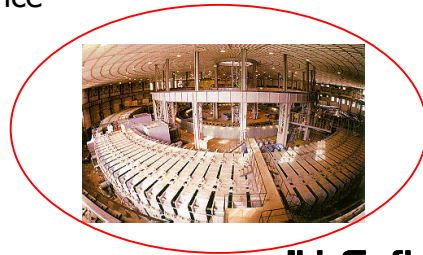


## 2. IbisSoft – as an environment for IS Research

- IS field studies behavior of IT-enabled human organizations
- Two ways of study complex systems
  - With minimum interference
  - With maximum interference



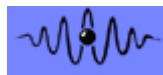
VS



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## How it works in other fields From history of Quantum Mechanics

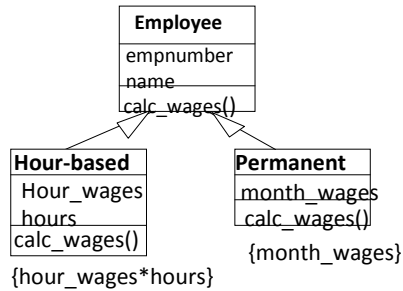
- Matrix theory (Heisenberg, Born, Jordan 1925)
- Wave Theory (Schrödinger, 1926)
- Mathematically they are equivalent (Schrödinger, 1926)
- This reflects the particle-wave duality



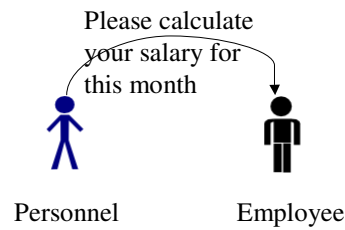
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## Why do we need alternative modeling methods in Computer Systems design

Employee that calculates its own wages



System point of view



Personnel point of view



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## Building an alternative model Main notions of object oriented model

- Objects
  - Have properties
  - Have complex structure
- Relationships (connection between the objects)
- Communication between objects along relationships
- Communication-based actions (changes in objects)



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## Classical object-oriented paradigm

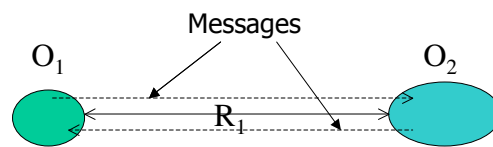
- Objects – instances of classes
  - Properties – attributes/variables
  - Complex structure – pointers to other objects (including private ones – sub-objects), or key-based inclusion (arrays)
- Relationships – object pointers
- Communication – sending messages (function calls)
- Actions – described as methods (functions inside objects)



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## Classical object-oriented paradigm Main characteristics

- Objects – Active
- Relationships – Passive
- Communication – Explicit



Chatting objects

Suit well some tasks, e.g. User Interface design

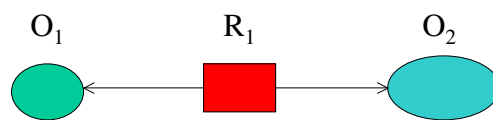


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## An alternative object-oriented model

### Main characteristics

- Objects – Passive
- Relationships – Active
- Communication – Implicit



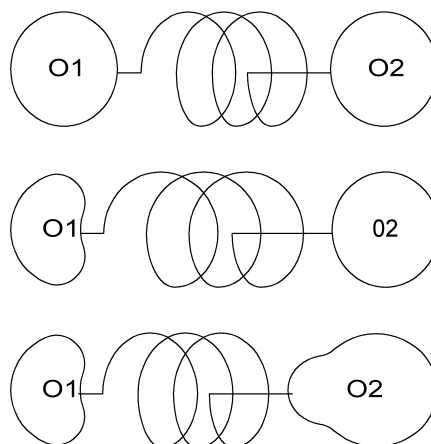
Silent objects

If you wish to change the world start with yourself



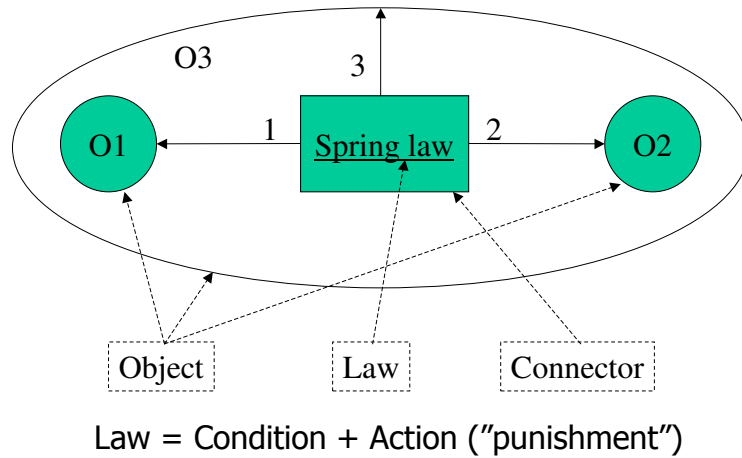
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### Example –two balls assembly



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## Model – two balls assembly



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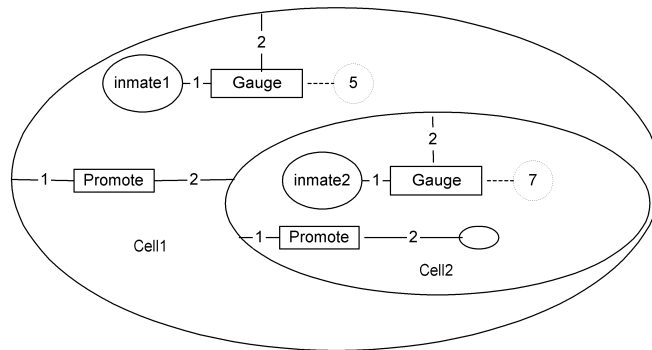
## Connector – computational device entrusted with a law

- *awakes* when one of its operands has been changed,
- *checks* whether the law still holds by reading the condition,
- *restores* it when it has been broken,
- *falls asleep*.



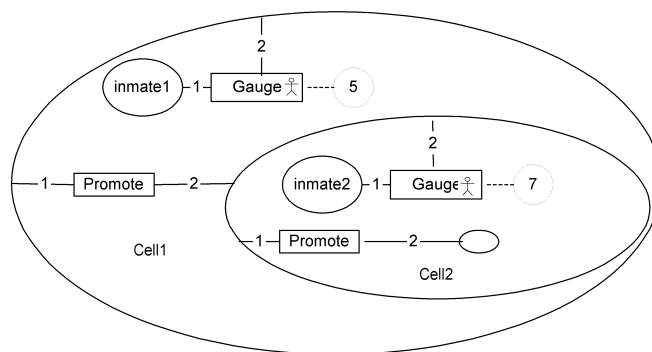
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## Example – Dynamic distributed sort



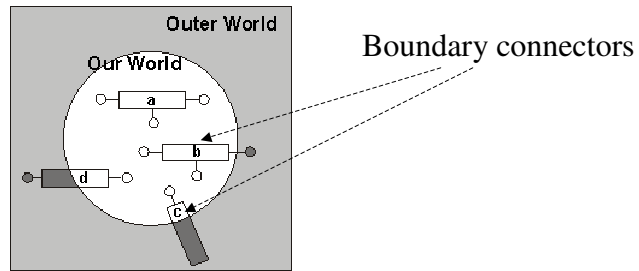
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## Where is a user



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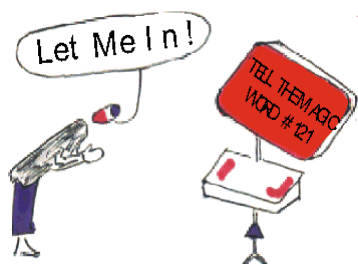
## Non-determinism – communication with the external world



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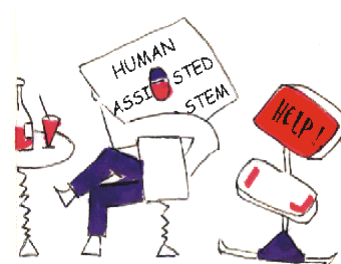
## Why do we need alternative modeling techniques

Old Generation  
Human-Assisting System



Powerful Toolkit

New Generation  
Human-Assisted System



Assembly Line



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## Differences between two generations

Aspect	Human-Assisting	Human-Assisted
Behavior	Predominantly <i>reactive</i>	Both <i>proactive</i> and <i>reactive</i>
Distribution of responsibility between application and users	To be established in initial <i>specifications</i>	To be establish and changed during the <i>application lifecycle</i> (flexible symbiosis)
The application's knowledge about the users	Enough to <i>restrict</i> access for various groups of users	Enough to <i>find</i> the right user for each task that need human assistance



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## Requirements on modeling techniques

Aspect	Human-Assisting	Human-Assisted
Type of system under modeling	<i>Open system</i>	<i>Close system</i>
Object of modeling	<i>Software</i>	<i>Business reality</i>
Units of dynamic behavior	<i>Business transactions</i>	<i>Business Processes</i>



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## Summary

- There already exist needs for alternative object-oriented techniques (more such needs can arrive in the future)
- It is possible to create such techniques (think out of the box)



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## Thank you for your attention!

Bider, I., Khomyakov, M. If You Wish to Change the World, Start with Yourself: An Alternative Metaphor for Objects Interaction. In: Piattini, M., Filipe, J., and Braz. J. (Eds.) *Proceedings of ICEIS 2002 - the Fourth Conference on Enterprise Information Systems*, Vol. 2, ICEIS Press, 2002, pp. 732-742  
<http://www.ibissoft.se/publications/tango/tango.pdf>

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