# Towards a Non-workflow Theory of Business Processes

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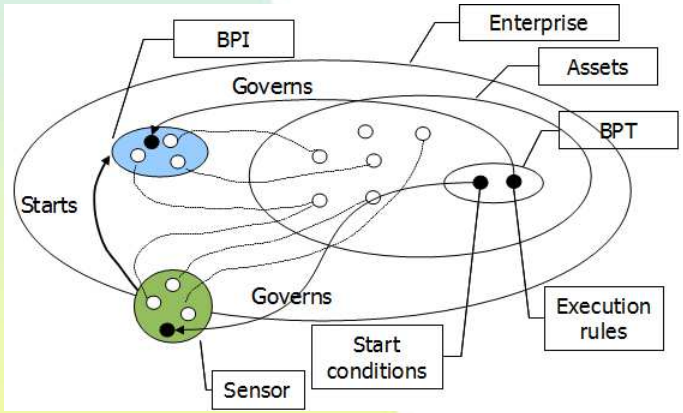
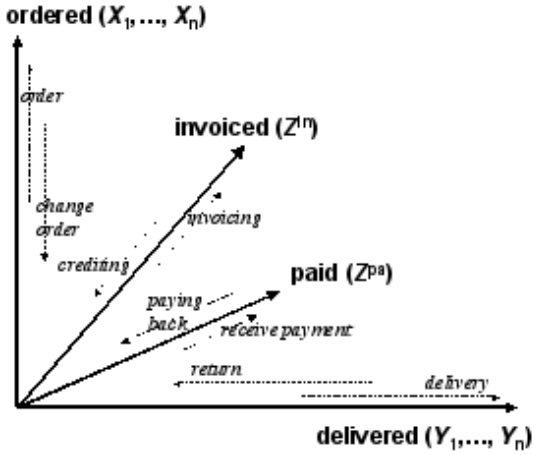



Keynote at ACM 2012 workshop: http://acm2012.blogs.dsv.su.se/
1st workshop on ACM and other non-workflow approaches to BPM

# Goal

Overview the efforts of a group of researchers and practitioners to build and test

- a theory of business processes (BP)

that could be of use for building

- non-workflow based business processes support (BPS) systems

# Plan - Three tasks:

I. Investigate role of BP in en enterprise/organization and connect them with other components of the enterprise structure

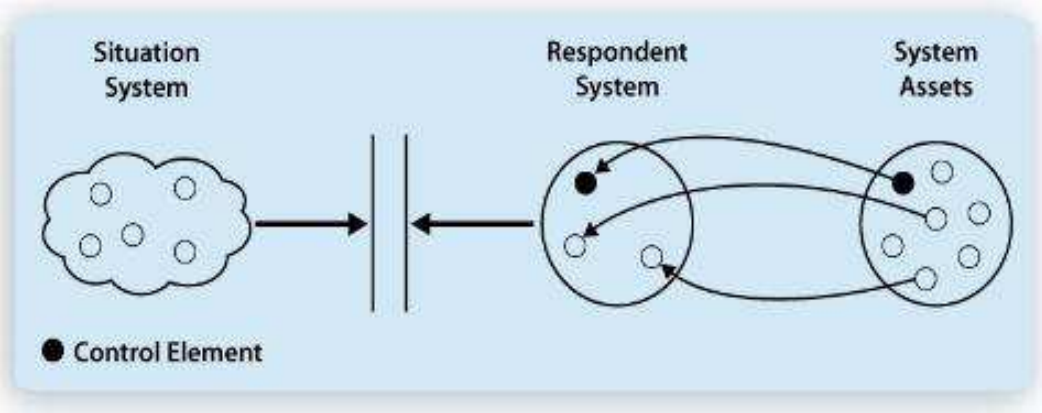
System theory – Systems Thinking/Systems design everything that concern systems behavior, especially where people are the integral part

II. Suggest a way of describing behavior of BP instances/cases that could be of use in building BPS system/services

Mathematical systems theory - modeling and controlling physical processes

III. Testing the ideas

# I. System coupling diagrams – a way of connecting BP to systems approach




- Situation System – A problem or opportunity situation; either unplanned or planned.
- Respondent System – The system created to respond to the situation where the parallel bars indicate that this system interacts with the situation and transforms the situation to a new situation.
- System Assets – The sustained assets of an enterprise that are to be utilized in responding to situation
- Control element – an asset that determines the behavior of respondent system.

H. Lawson, *A Journey Through the Systems Landscape*, College Publications, 2010

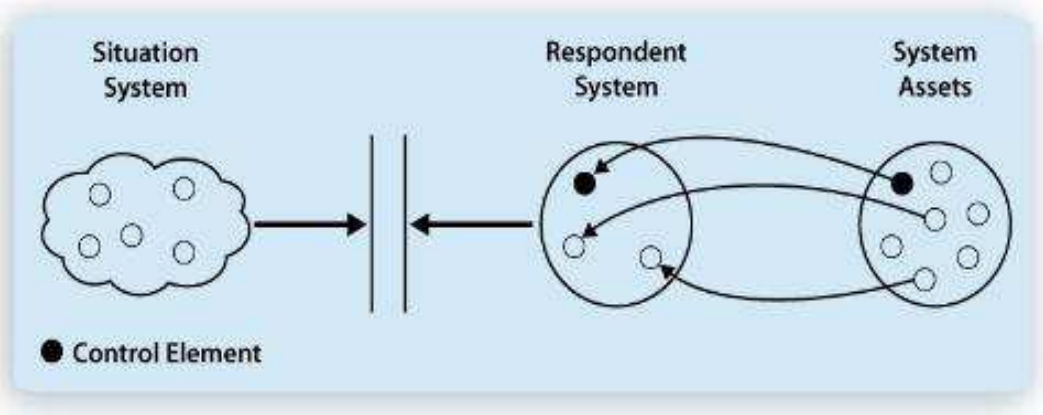
# Business process concept – a way of dealing with known situations

Duality of business process concept

- Business process model/description/type/template (BPT) is a plan/template for handling business situations of a certain type

- Business process instance/case (BPI) is a situation (being) handled according to the plan/template

# Business process interpretation in terms of system coupling diagrams



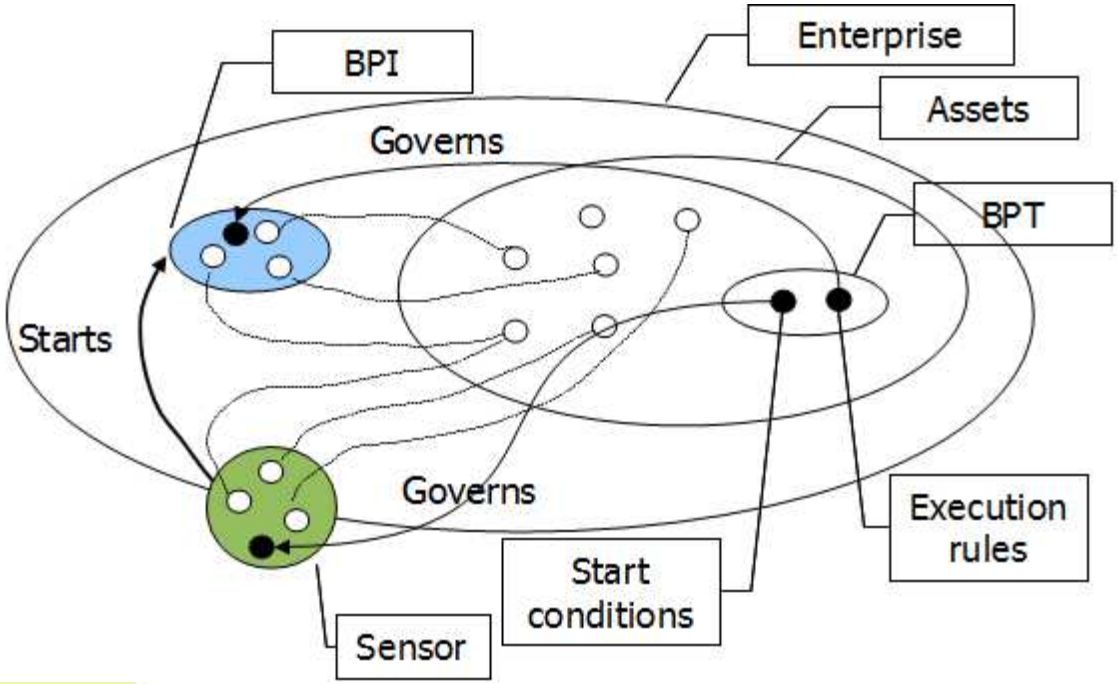

BPI = (temporal) respondent system

- Created to handle a specific business situation
- Disbands after reaching the goal set for this system has been reached

BPT = control element that determines the behavior of the respondent system, but not only

- *Start conditions* - when a process instance should be *Start conditions* - when a process instance should be created
- *Execution rules* – whom to include and plan of actions

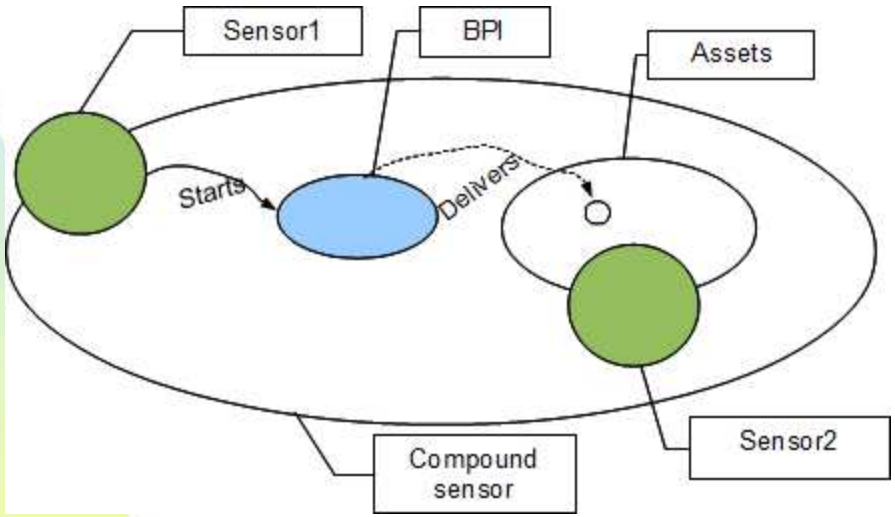
# The enterprise model



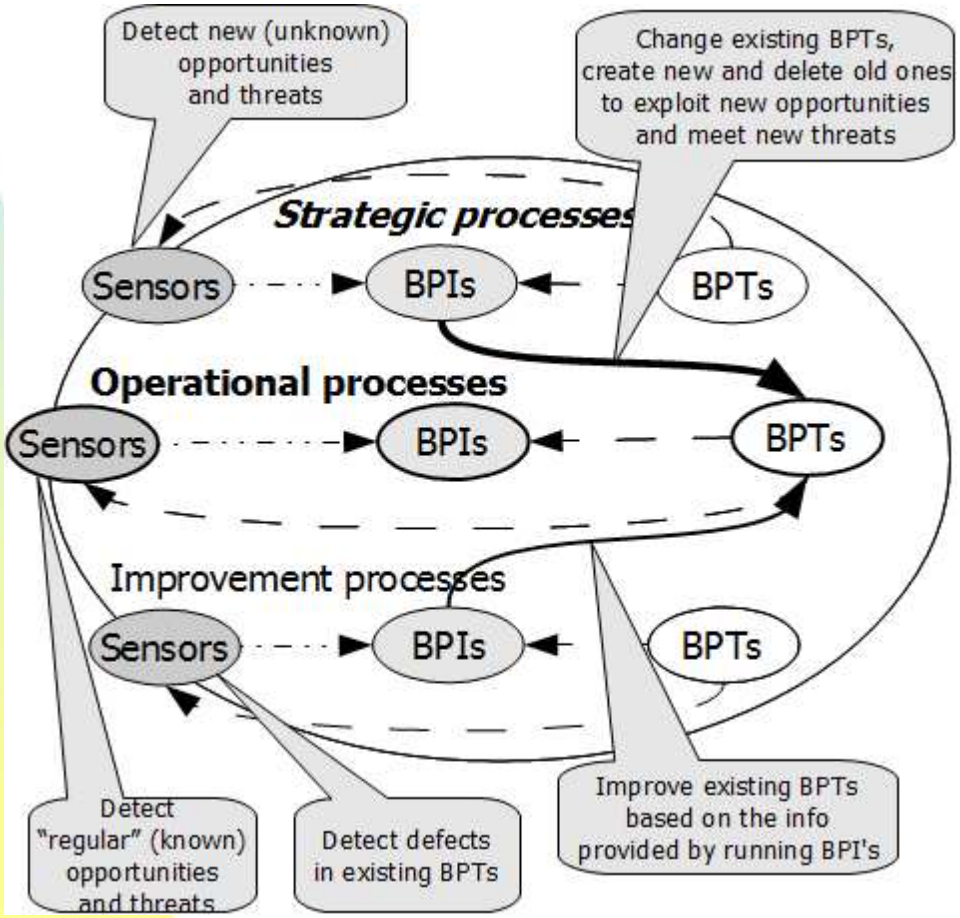

Three-component model:

- Assets - people, departments, computers, policy documents, Business Process Templates (BPT)
- Sensors
- Business process instances (BPIs).

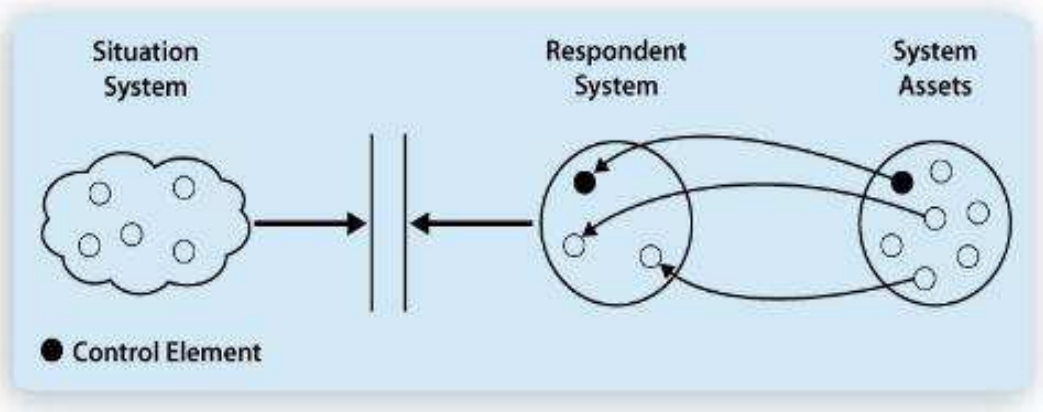
# Compound sensors & process instances



# Enterprise as a complex multilevel adaptable system



# II. BPI = Respondent system. How to describe its behavior?

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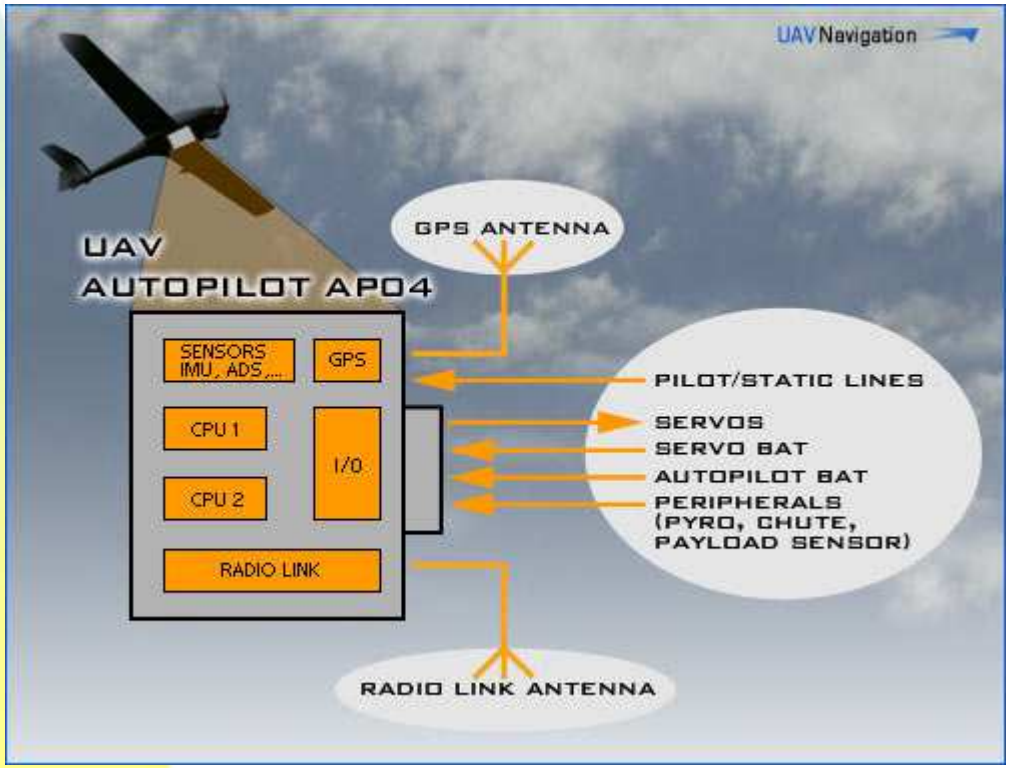
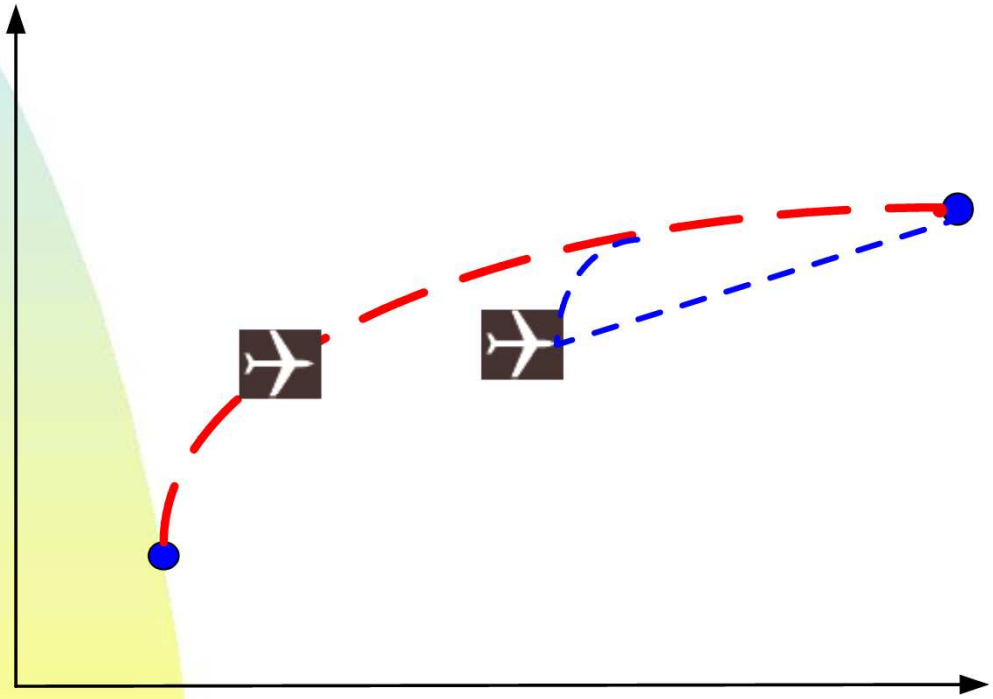
# Where to look for the right kind of theory?

Where it already works – in the domain of physical processes control



# A point moving through a state space



# Mathematical system theory

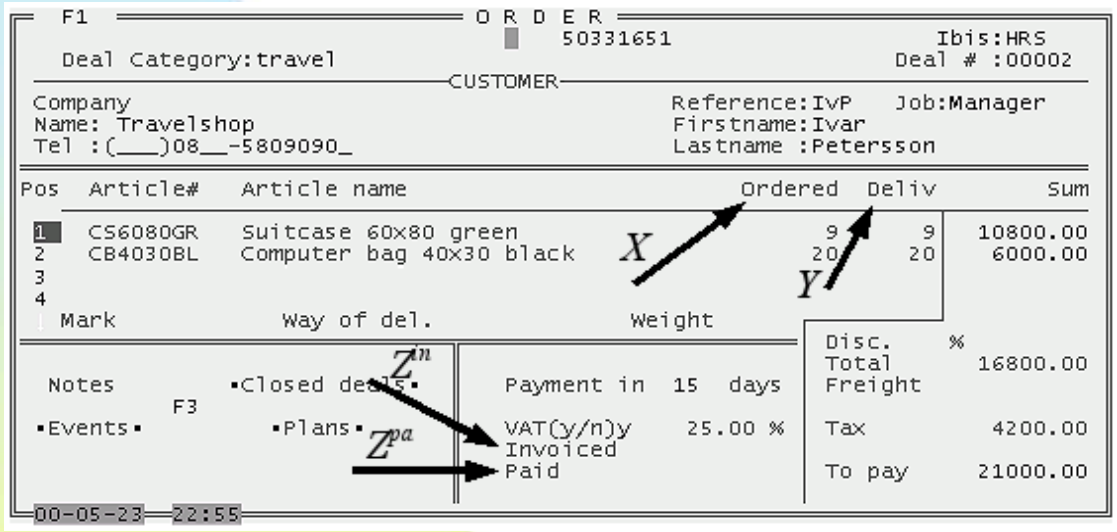
- Modeling and control of physical processes –
- Multidimensional state space
- Continuous-time process trajectory:

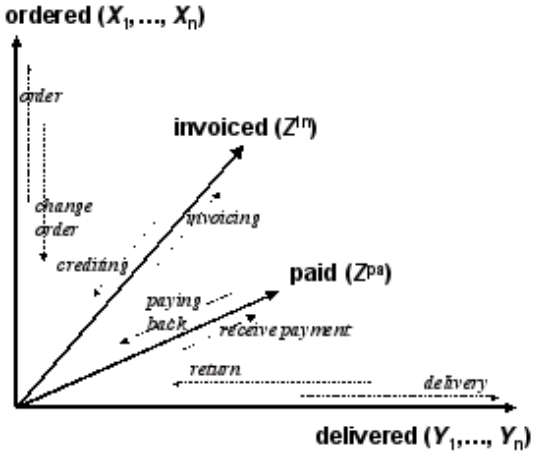
$$F(x, \dot{x}, w) = 0$$

- $x$ – vector of state variables (reals)
- $\dot{x}$ – derivatives of state variables (direction and speed of movement)
- $w$ – vector of environment variables
- Goal – a point or a surface in the state space

# Applying ideas to BP domain

State-oriented view on business processes



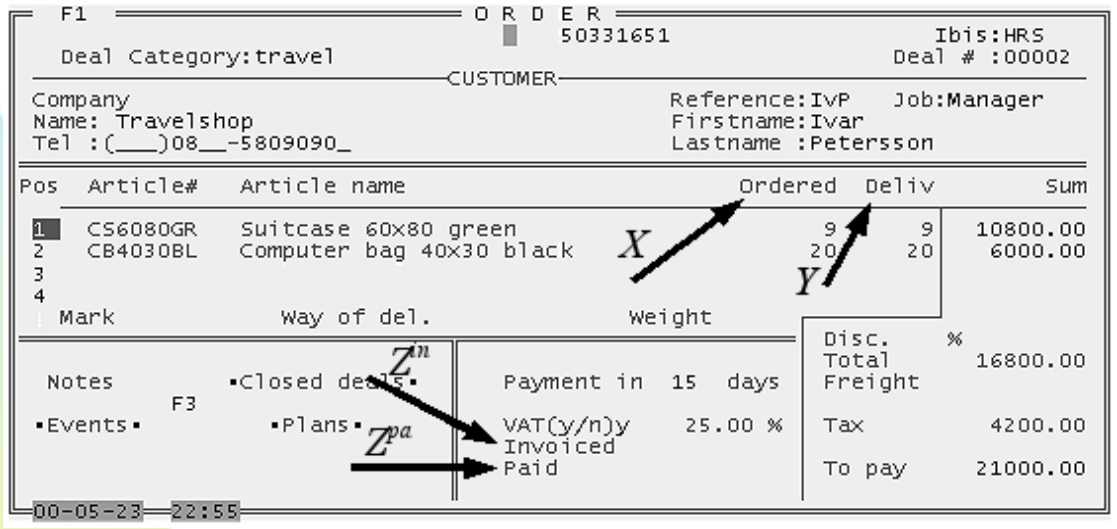



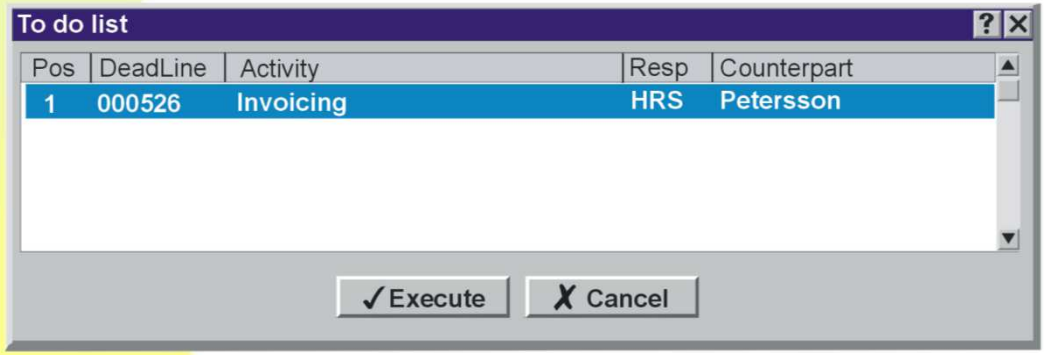

- For each item *Ordered = Delivered*
- *To pay = Total + Freight + Tax*

- *Invoiced = To pay*
- *Paid = Invoiced*

- *Ordered > Delivered* ⇨ shipment
- *To pay > Invoiced* ⇨ invoicing

# Connecting position to direction & speed of movement



# What does it mean to define/describe/model a BP

- Define a sate space
- Define a goal – a surface in it
- Define a set of permissible trajectories
  - Prescriptive – very few allowed trajectories (workflow)
  - Constraint based – prohibit wrong turns
  - Mixed – prescriptive on some paths, constraint based on others

# Where the BP definition/ model/ template can be found?

- In people's heads: tacit knowledge
- As written documents, e.g., process maps and other kinds of process descriptions: explicit knowledge
- In software systems/services used to support running process instances: built-in knowledge

# Do we need to built in all the details of the process?

- We may not know them (new or radically changed processes)
- It may irritate experts and they won't use the system
- It may hinder initiative and creativity of process participants

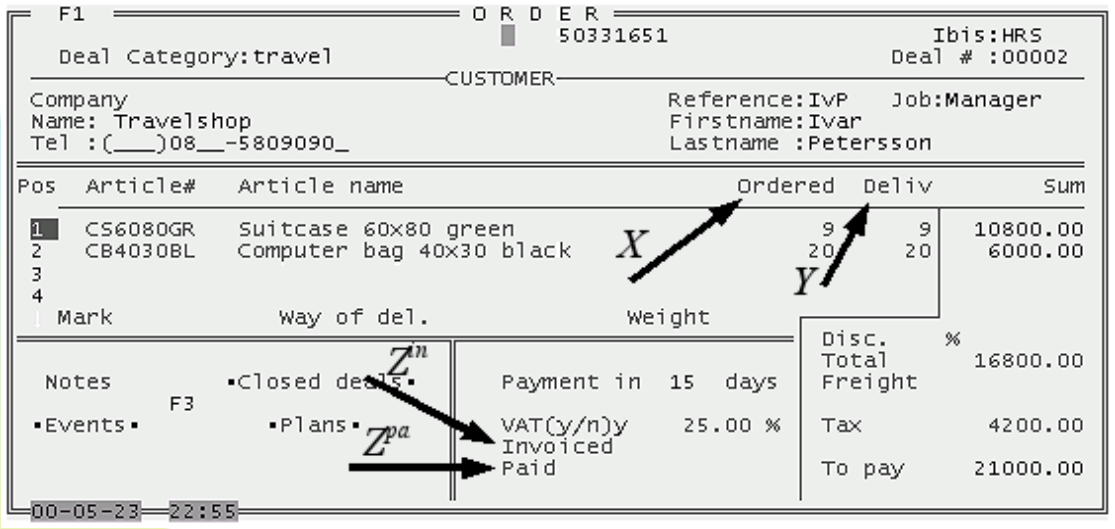
# Role of BPS?

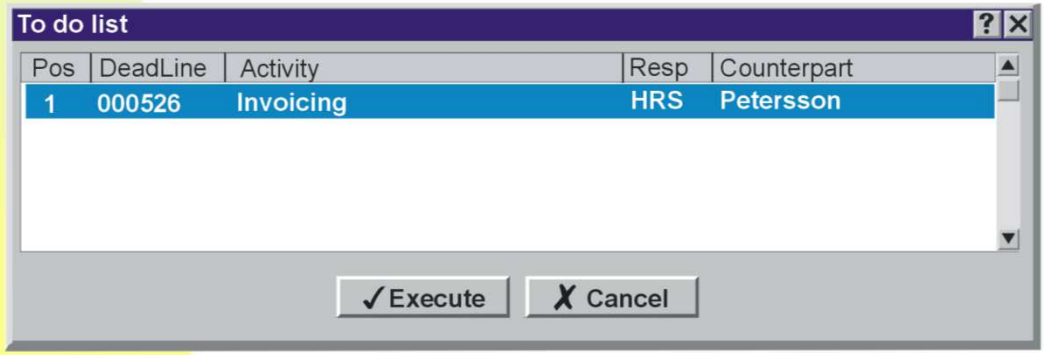
- Provide a shared map of the process multi-dimensional state space so that they can together mark the goal and current position of the given process instance and plan next moves
- Support collaboration coordination – especially when simultaneous movement needs to be done in several dimensions
- Help to navigate along permissible trajectories

# Help in navigation

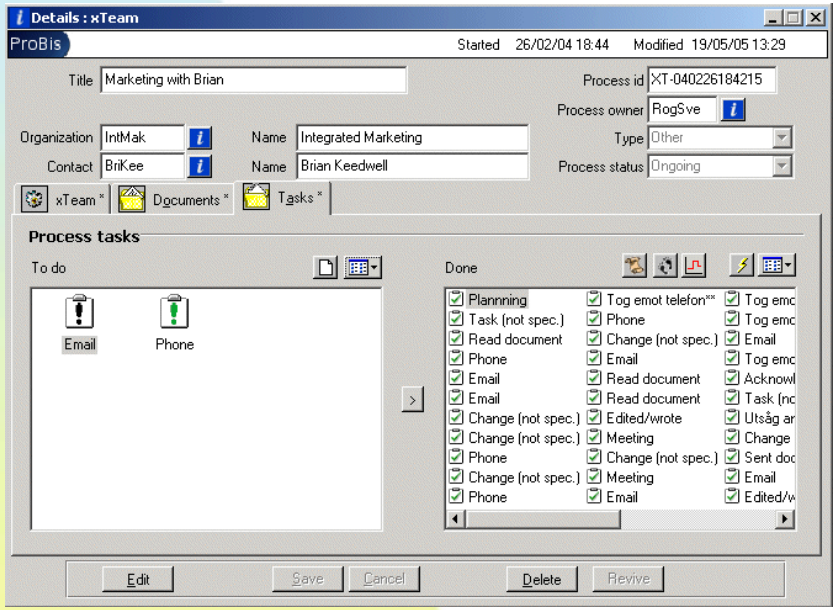
- Force to follow certain path (at least in certain places) - obligation
- Prohibit some paths (at least in certain places) - prohibition
- Suggest some paths but not insists on them - recommendations
- Discourage some paths but allow to follow them if possible – negative recommendations

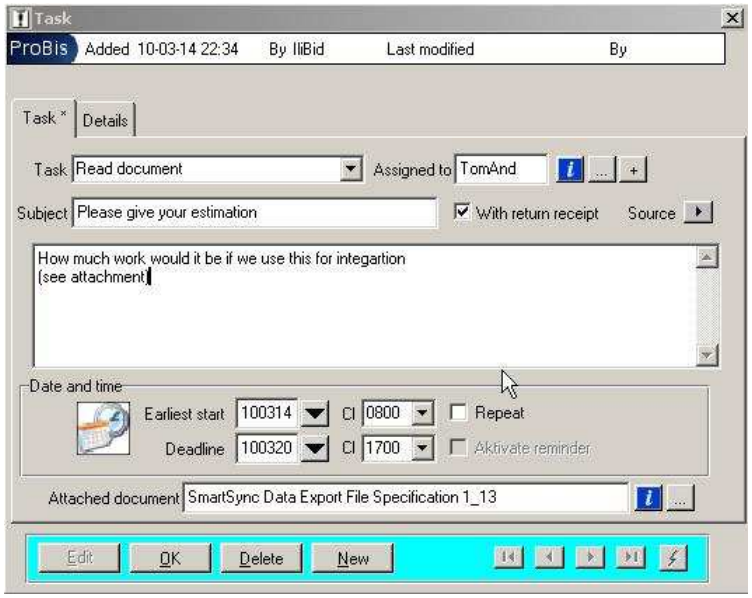
# III Testing – 1st case (DealDriver)



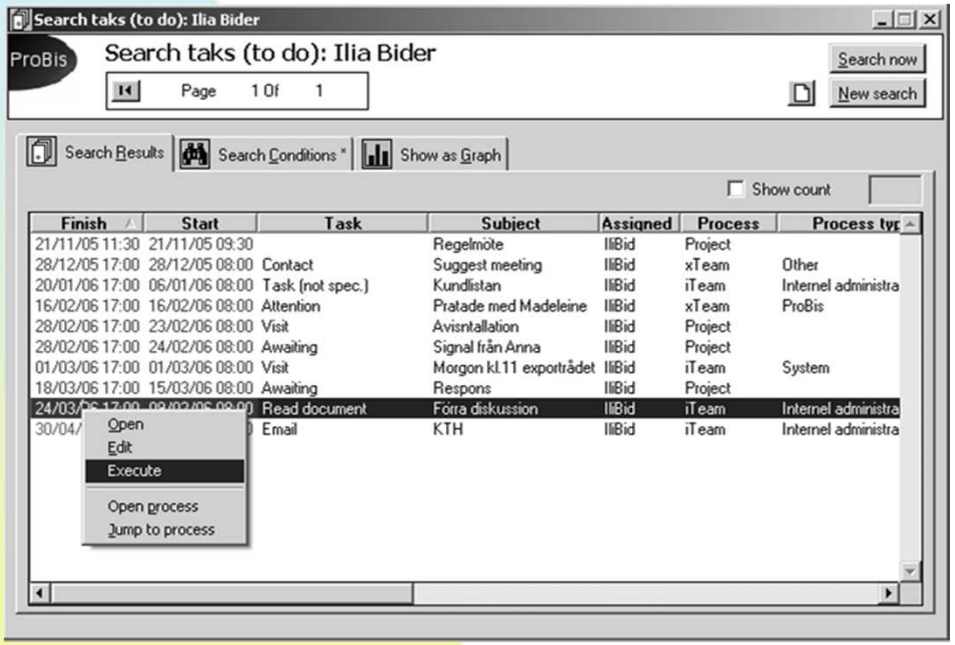



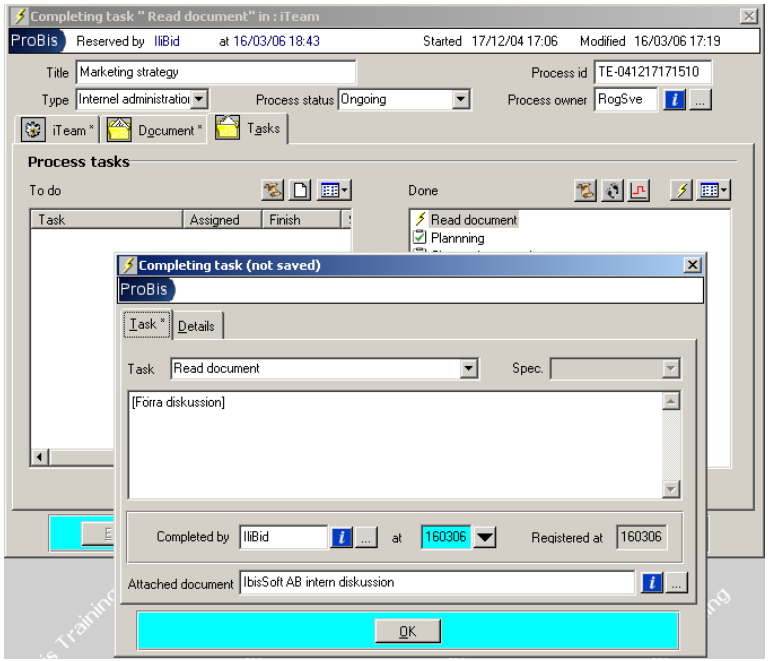
# Testing – 2nd case (ProBis)



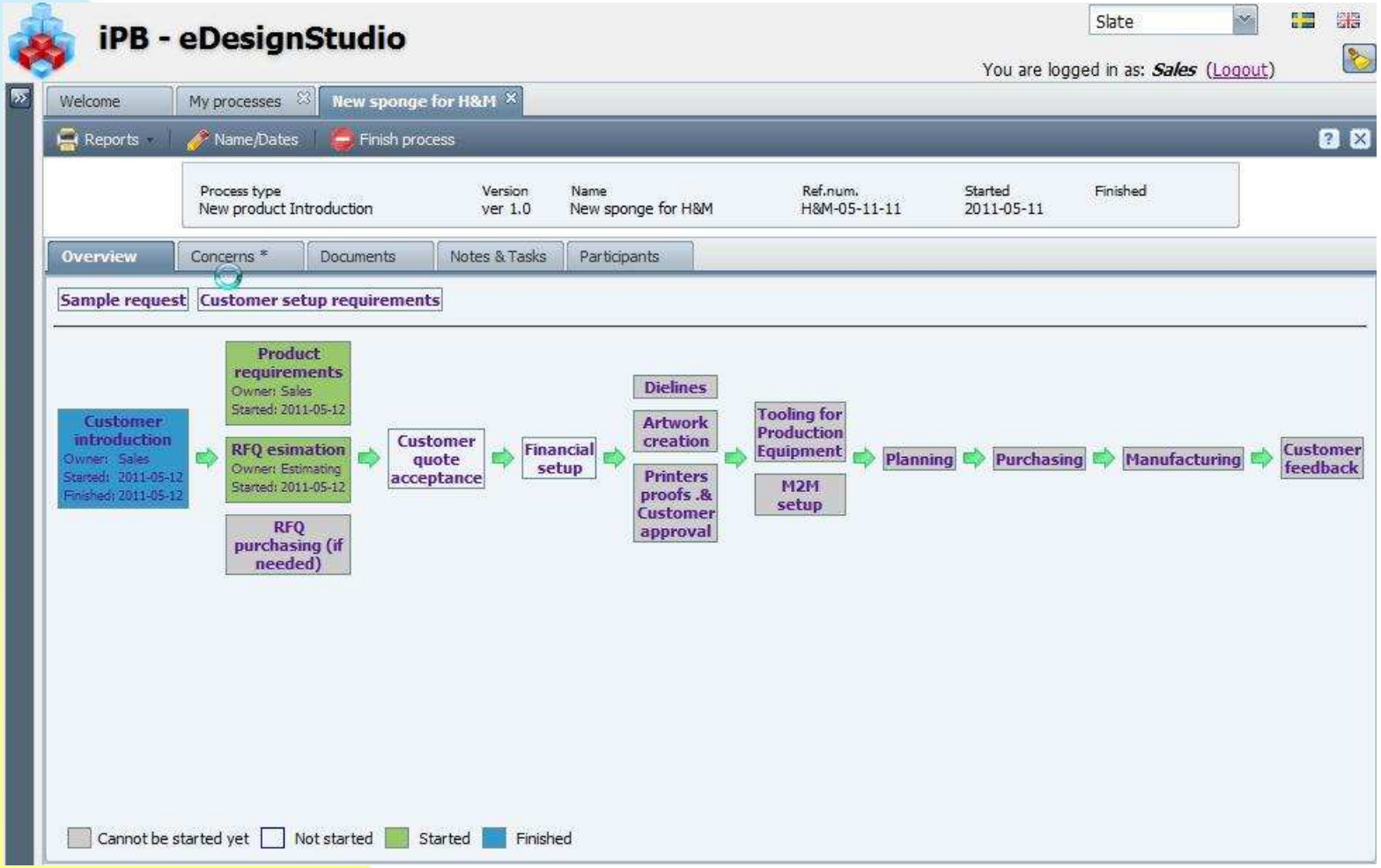
# Testing – 2nd case (ProBis) continue



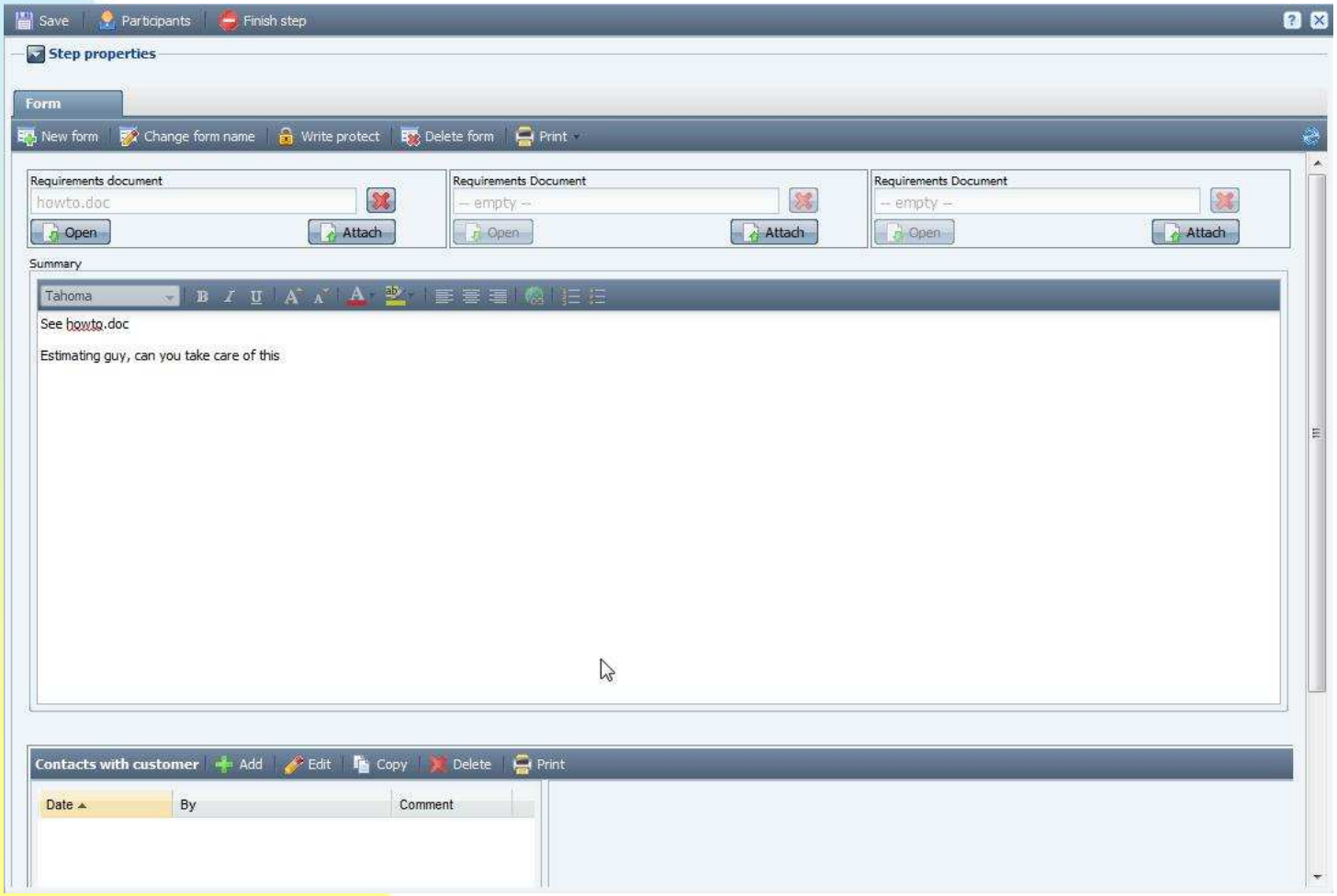




Using invitations in ProBis

# Testing – 3nd case (iPB)



# Testing – 3nd case (iPB) Continue



# Contributeors – partial list

Maxim Khomyakov, Eugene Pushchinsky, Rogier Svensson, Tomas Andersson, Erik Perjons, Paul Johannesson, Alex Durnovo, Alexey Striy

# Some references


Bider, I., Bellinger, G., Perjons, E.: Modeling an Agile Enterprise: Reconciling Systems and Process Thinking, LNBIP, vol. 92, Springer, 2011, 238-252. http://www.ibissoft.se/publications/PoEM11.pdf

M. Khomyakov and I. Bider, Achieving Workflow Flexibility through Taming the Chaos, in Proceedings of 6th OOIS, Springer, 2000, 85-92. http://www.ibissoft.se/publications/tamingchaos.pdf

Bider I. & Striy A., Controlling business process instance flexibility via rules of planning, IJBPIM, Vol. 3, No. 1, 2008,15-25. http://www.ibissoft.se/publications/FlexControl.pdf

Bider I., Perjons E., Johannesson P. In Search of the Holy Grail: Integrating social software with BPM. Experience report. LNBIP Vol. 50, Springer, 2010, 1-13. http://www.ibissoft.se/publications/HolyGrail.pdf

Bider, I. State-oriented business process modeling: principles, theory and practice. KTH (Royal Institute of Technology), Stockholm, 2002. http://www.diva-portal.org/kth/theses/abstract.xsql?dbid=3375

# Thank you for your attention!

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