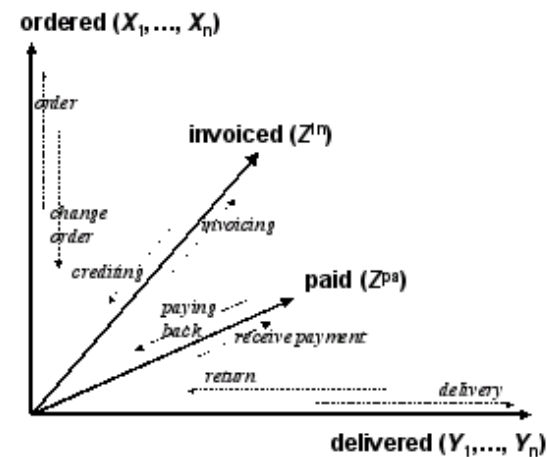
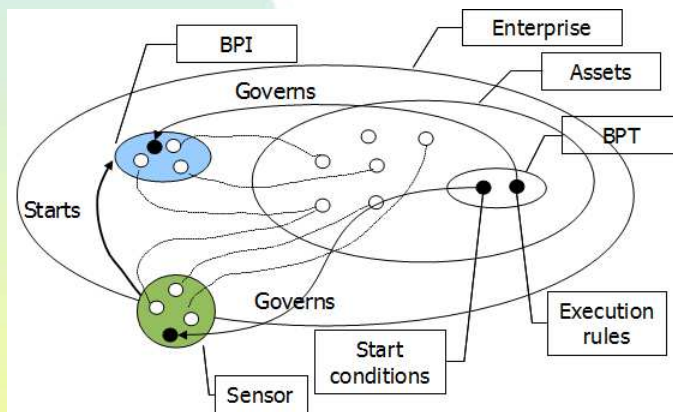


Towards a Non-workflow Theory of Business Processes

Ilia Bider - IbisSoft/DSV SU



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 an 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

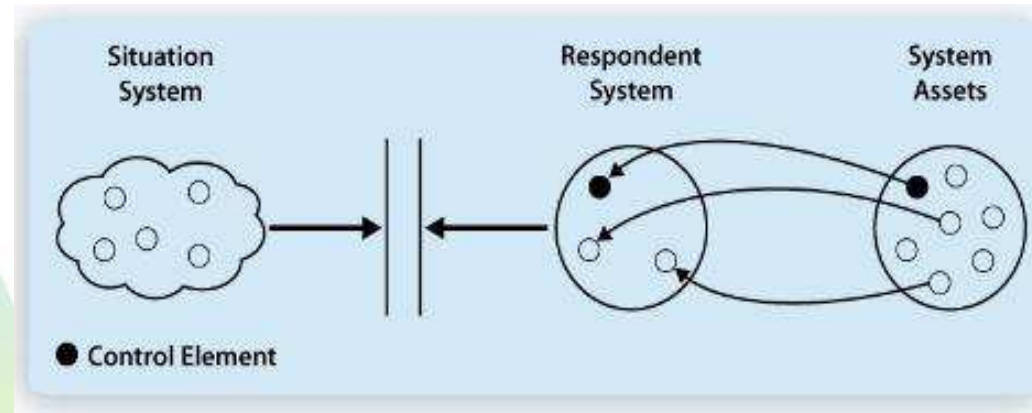
- II. Suggest a way of describing behavior of BP instances/cases that could be of use in building BPS system/services

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



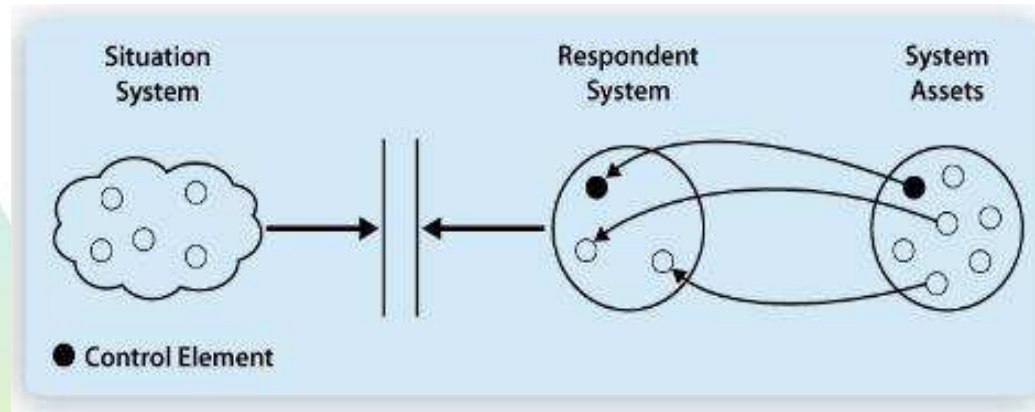
Business process concept – a way of dealing with known situations

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

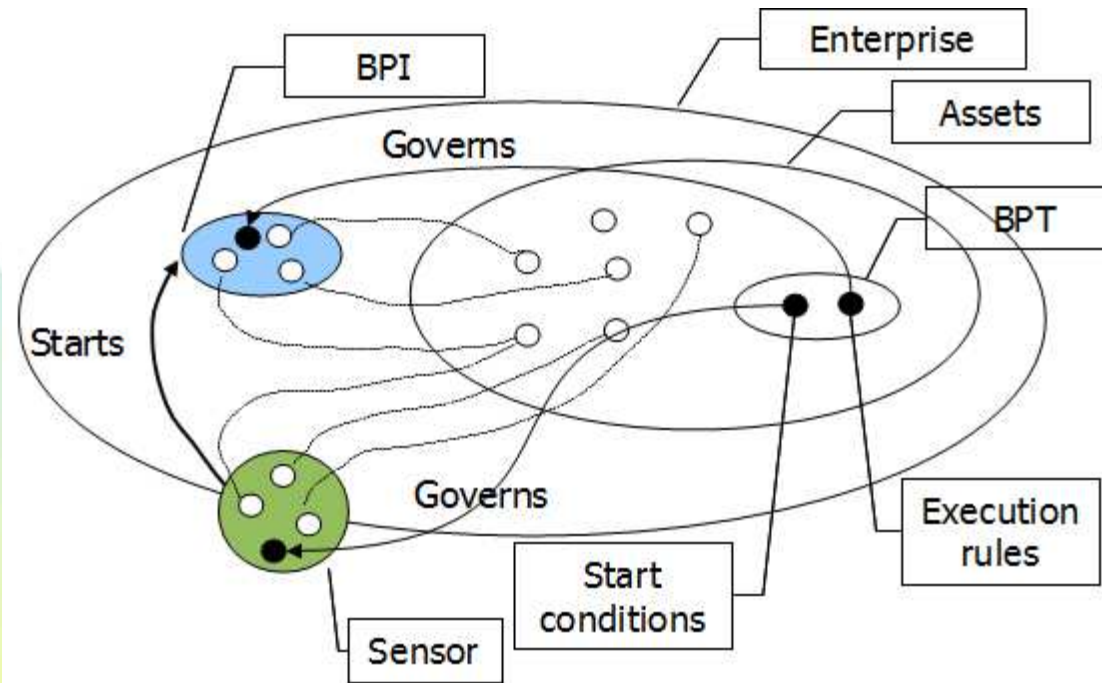
- Created to handle a specific business situation
- Disbands after reaching the goal set for this system has been reached

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

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



The enterprise model

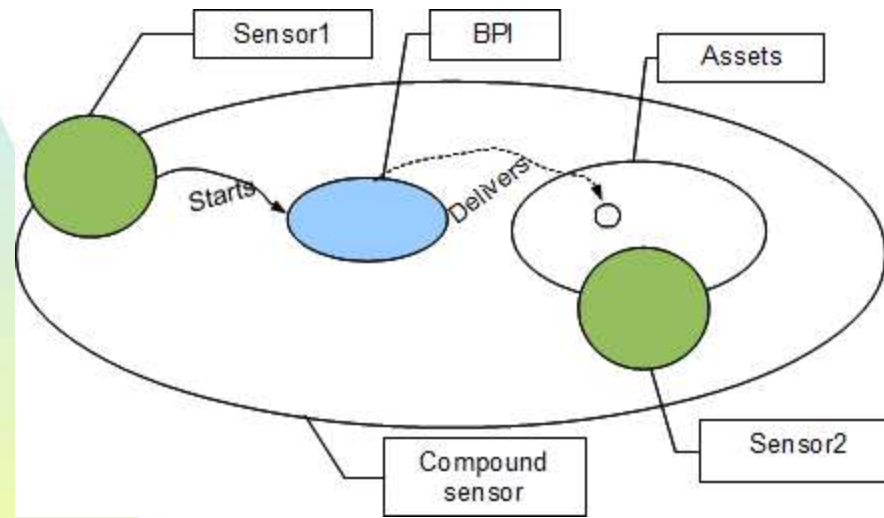


Three-component model:

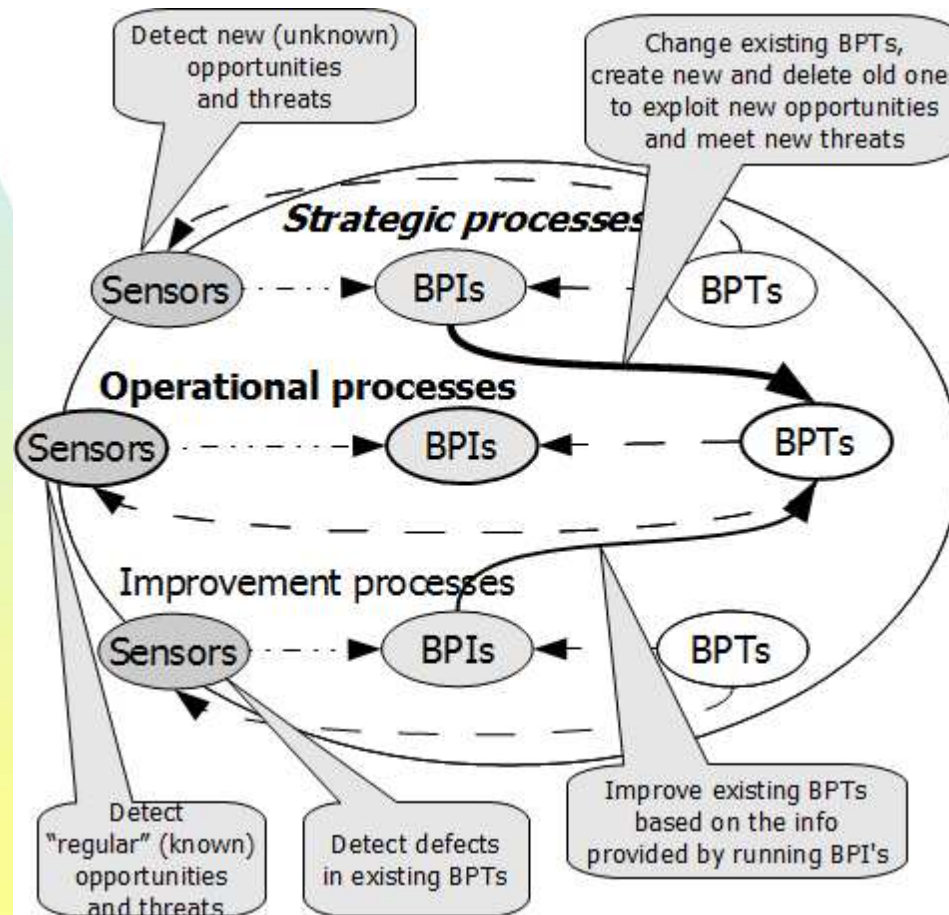
- ◆ Assets - people, departments, computers, policy documents, Business Process Templates (BPT)
- ◆ Sensors
- ◆ Business process instances (BPIs).



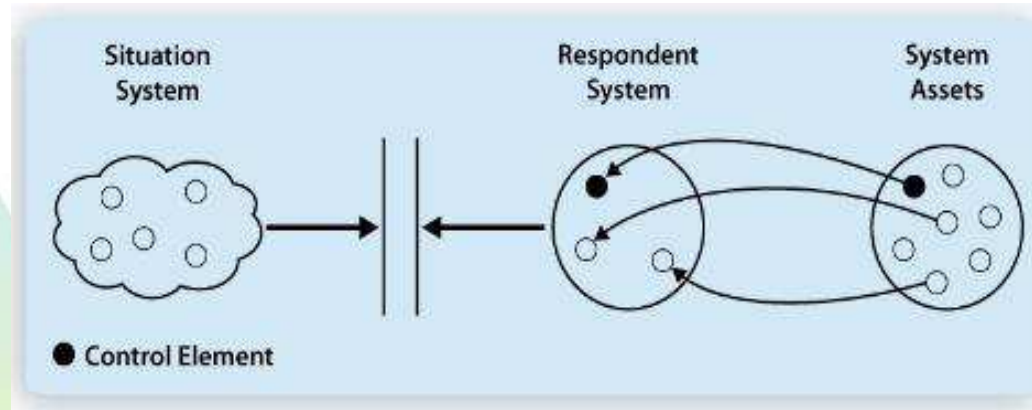
Compound sensors & process instances



Enterprise as a complex multilevel adaptable system



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



BPI = (temporal) respondent system

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

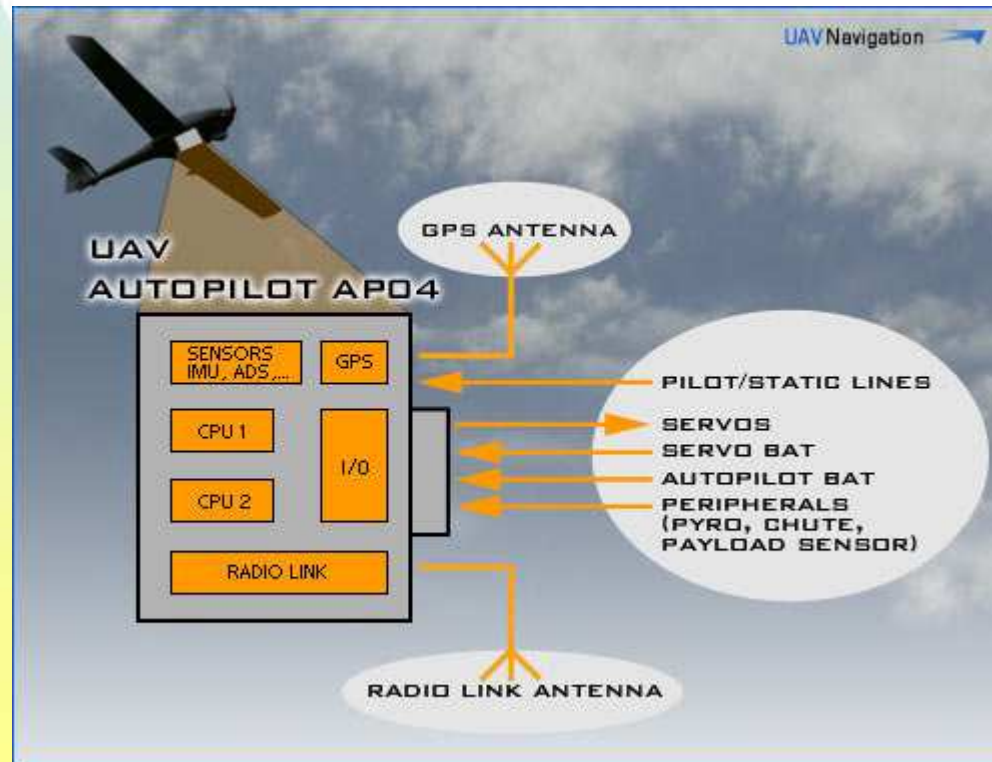
BPT = control element that determines the behavior of the respondent system, but not only

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

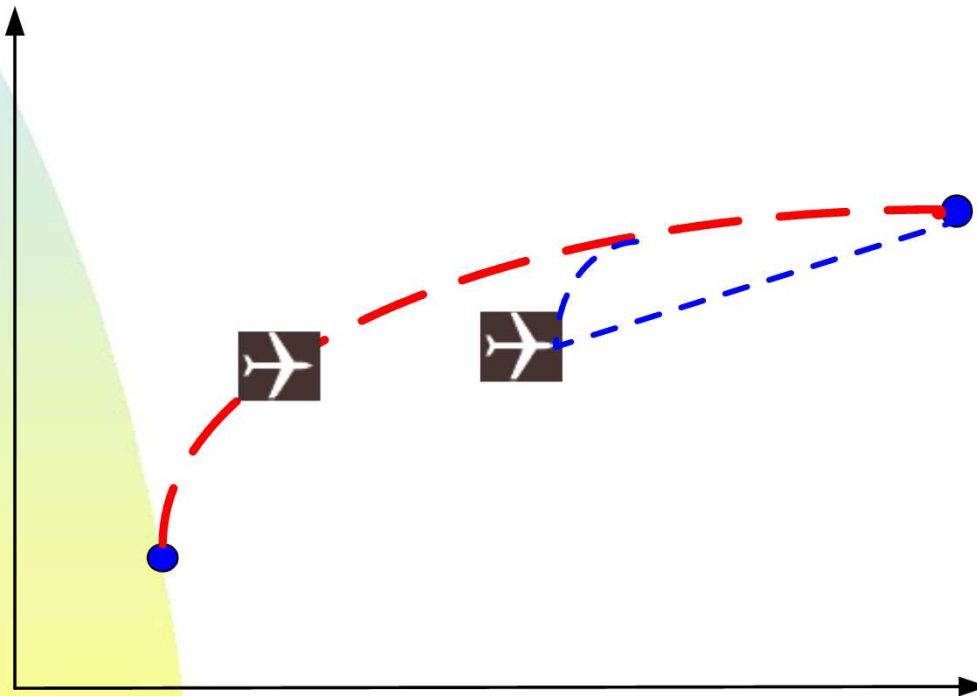


Where to look for the right kind of theory?

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:

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

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

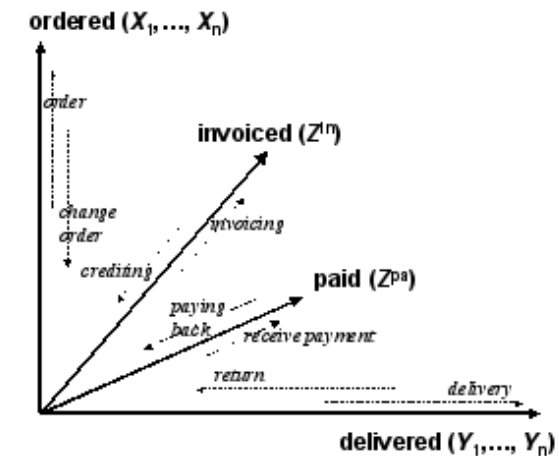


Applying ideas to BP domain

State-oriented view on business processes

Pos	Article#	Article name	Ordered	Deliv	Sum
1	CS6080GR	Suitcase 60x80 green	9	9	10800.00
2	CB4030BL	Computer bag 40x30 black	20	20	6000.00
3					
4					

Disc.	Total	Freight	Tax	To pay
	16800.00		4200.00	21000.00



- 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

F1 ORDER Ibis:HRS
Deal Category:travel 50331651 Deal #:00002

CUSTOMER
Company Name: Travelshop Reference:IvP Job:Manager
Tel : ()08__-5809090_ Firstname:Ivar
Lastname :Petersson

Pos	Article#	Article name	Ordered	Deliv	Sum
1	CS6080GR	Suitcase 60x80 green	9	9	10800.00
2	CB4030BL	Computer bag 40x30 black	20	20	6000.00
3					
4					

Mark Way of del. Weight

Notes F3 •Closed deals
•Events •Plans

Payment in 15 days
VAT(y/n)y 25.00 %
Invoiced
Paid

Disc. %
Total 16800.00
Freight
Tax 4200.00
To pay 21000.00

00-05-23 22:55

To do list

Pos	DeadLine	Activity	Resp	Counterpart
1	000526	Invoicing	HRS	Petersson

✓ Execute X Cancel



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

- Define a state 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)

F1 ORDER 50331651 Ibis:HRS Deal # :00002

Deal Category:travel CUSTOMER

Company Name: Travelshop Reference:IvP Job:Manager
 Tel : ()08__-5809090_ Firstname:Ivar Lastname :Petersson

Pos	Article#	Article name	Ordered	Deliv	Sum
1	CS6080GR	Suitcase 60x80 green	9	9	10800.00
2	CB4030BL	Computer bag 40x30 black	20	20	6000.00
3					
4					

Mark Way of del. Weight

Notes: Closed deals, Events, Plans, VAT(y/n)y Invoiced Paid

Payment in 15 days 25.00 %

Disc. Total Freight % 16800.00
 Tax 4200.00
 To pay 21000.00

00-05-23 22:55

To do list

Pos	DeadLine	Activity	Resp	Counterpart
1	000526	Invoicing	HRS	Petersson

Execute Cancel



Testing – 2nd case (ProBis)

Details: xTeam
ProBis Started 26/02/04 18:44 Modified 19/05/05 13:29

Title: Marketing with Brian Process id: XT-040226184215

Process owner: RogSve

Organization: IntMak Name: Integrated Marketing Type: Other

Contact: BriKee Name: Brian Keedwell Process status: Ongoing

Process tasks

To do	Done
Email	<input checked="" type="checkbox"/> Planning
Phone	<input checked="" type="checkbox"/> Task (not spec.)
	<input checked="" type="checkbox"/> Read document
	<input checked="" type="checkbox"/> Phone
	<input checked="" type="checkbox"/> Email
	<input checked="" type="checkbox"/> Email
	<input checked="" type="checkbox"/> Email
	<input checked="" type="checkbox"/> Change (not spec.)
	<input checked="" type="checkbox"/> Change (not spec.)
	<input checked="" type="checkbox"/> Phone
	<input checked="" type="checkbox"/> Change (not spec.)
	<input checked="" type="checkbox"/> Change (not spec.)
	<input checked="" type="checkbox"/> Phone
	<input checked="" type="checkbox"/> Change (not spec.)
	<input checked="" type="checkbox"/> Phone

Buttons: Edit, Save, Cancel, Delete, Revive

Task
ProBis Added 10-03-14 22:34 By IliBid Last modified By

Task: Read document Assigned to: TomAnd

Subject: Please give your estimation With return receipt Source

How much work would it be if we use this for integration (see attachment)

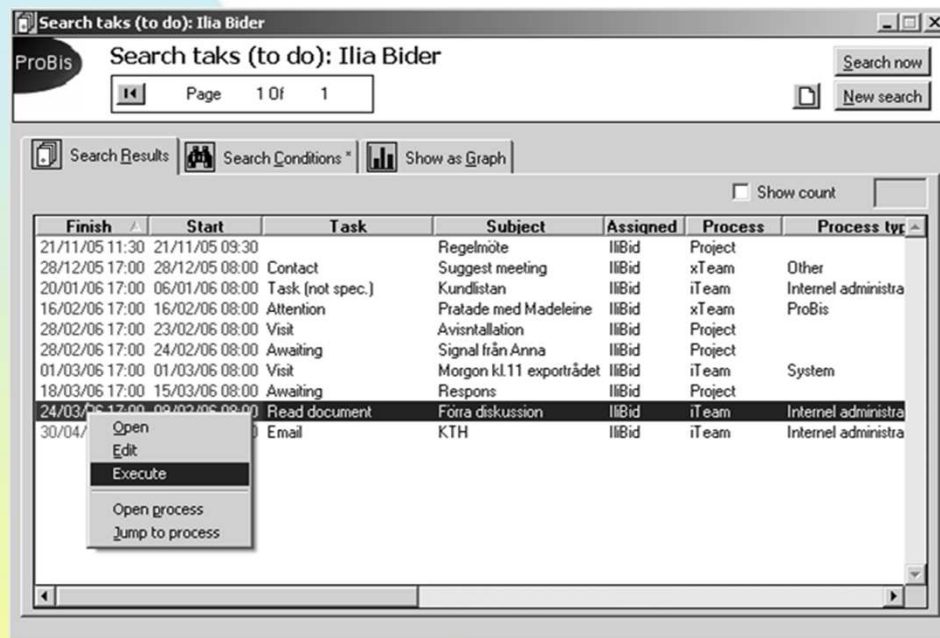
Date and time: Earliest start: 100314 0800 Repeat: Deadline: 100320 1700 Activate reminder:

Attached document: SmartSync Data Export File Specification 1_13

Buttons: Edit, OK, Delete, New



Testing – 2nd case (ProBis) continue



Search taks (to do): Ilia Bider

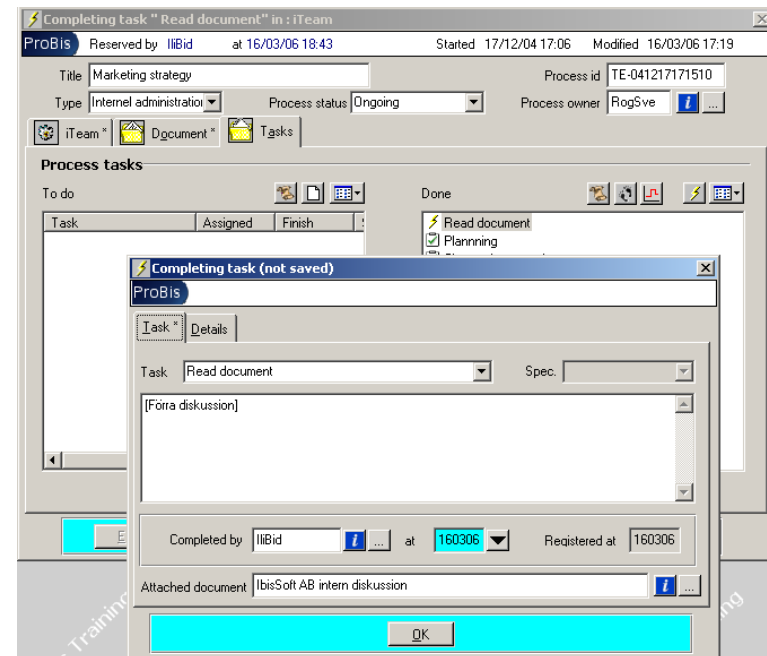
Page 1 Of 1

Search Results Search Conditions * Show as Graph

Finish	Start	Task	Subject	Assigned	Process	Process typ
21/11/05 11:30	21/11/05 09:30		Regelmöte	IliaBider	Project	
28/12/05 17:00	28/12/05 08:00	Contact	Suggest meeting	IliaBider	xTeam	Other
20/01/06 17:00	06/01/06 08:00	Task (not spec.)	Kundlistan	IliaBider	iTeam	Internet administra
16/02/06 17:00	16/02/06 08:00	Attention	Pratade med Madeleine	IliaBider	xTeam	ProBis
28/02/06 17:00	23/02/06 08:00	Visit	Avisntallation	IliaBider	Project	
28/02/06 17:00	24/02/06 08:00	Awaiting	Signal från Anna	IliaBider	Project	
01/03/06 17:00	01/03/06 08:00	Visit	Morgon kl.11 exportrådet	IliaBider	iTeam	System
18/03/06 17:00	15/03/06 08:00	Awaiting	Respons	IliaBider	Project	
24/03/06 17:00	09/03/06 08:00	Read document	Föira diskussion	IliaBider	iTeam	Internet administra
30/04/06 17:00	09/04/06 08:00	Email	KTH	IliaBider	iTeam	Internet administra

Context menu for the selected row:

- Open
- Edit
- Execute
- Open process
- Jump to process



Completing task "Read document" in: iTeam

ProBis Reserved by IliaBider at 16/03/06 18:43 Started 17/12/04 17:06 Modified 16/03/06 17:19

Title Marketing strategy Process id TE-041217171510

Type Internet administration Process status Ongoing Process owner RogSve

Process tasks

To do: Read document

Done: Read document, Planning

Completing task (not saved)

Task: Read document Spec.:

[Föira diskussion]

Completed by IliaBider at 160306 Registered at 160306

Attached document IbisSoft AB intern diskussion

OK

Using invitations in ProBis



Testing – 3rd case (iPB)

The screenshot displays the iPB - eDesignStudio interface. At the top, the title bar shows 'iPB - eDesignStudio' and 'Slate'. Below the title bar, there are tabs for 'Welcome', 'My processes', and 'New sponge for H&M'. A toolbar contains 'Reports', 'Name/Dates', and 'Finish process'. A table below the toolbar lists process details:

Process type	Version	Name	Ref.num.	Started	Finished
New product Introduction	ver 1.0	New sponge for H&M	H&M-05-11-11	2011-05-11	

Below the table, there are tabs for 'Overview', 'Concerns *', 'Documents', 'Notes & Tasks', and 'Participants'. The 'Overview' tab is active, showing a 'Sample request' section with 'Customer setup requirements'. A process flow diagram is displayed below, showing the following steps:

- Customer introduction (Finished)
- Product requirements (Started)
- RFQ estimation (Started)
- Customer quote acceptance (Not started)
- Financial setup (Not started)
- Dielines (Not started)
- Artwork creation (Not started)
- Printers proofs & Customer approval (Not started)
- Tooling for Production Equipment (Not started)
- M2M setup (Not started)
- Planning (Not started)
- Purchasing (Not started)
- Manufacturing (Not started)
- Customer feedback (Not started)

At the bottom, a legend indicates the status of each step: Cannot be started yet, Not started, Started, Finished.



Testing – 3rd case (iPB) Continue

The screenshot displays a software window titled "Step properties" with a menu bar containing "Save", "Participants", and "Finish step". Below the menu bar, there is a "Form" tab with a toolbar including "New form", "Change form name", "Write protect", "Delete form", and "Print".

The main area is divided into three sections:

- Attachments:** Three panels, each titled "Requirements document", "Requirements Document", and "Requirements Document". The first panel shows "howto.doc" with "Open" and "Attach" buttons. The other two panels show "-- empty --" with "Open" and "Attach" buttons.
- Summary:** A text area with a "Tahoma" font dropdown and a rich text editor toolbar. The text contains "See [howto.doc](#)" and "Estimating guy, can you take care of this".
- Contacts with customer:** A table with a toolbar for "Add", "Edit", "Copy", "Delete", and "Print". The table has columns for "Date", "By", and "Comment".



Contributeors – partial list

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



Some references

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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!

Ilia Bider, DSV SU/IbisSoft

Email: ilia@dsv.su.se

ilia@ibissoft.se

