



POLISH-JAPANESE ACADEMY  
OF INFORMATION TECHNOLOGY

# Content Management Systems (CMS)

## Lecture 08: Workflows

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# Agenda

- Definition
- Research and development
- Application
- Examples
- Modeling
- Standards
- Summary

*Materials used from professor K. Subieta*

# What are workflows?

- There is no definition that would be satisfactory to everyone. "Workflows" integrate many concepts. One of many definitions:
  - Computer supported work of human teams by ordering, organizing, automating, transmitting and tracking the work performed by these teams.

# Definitions of workflows

- Workflow software is designed to streamline business processes by automating the following aspects:
  - transferring activities to be carried out by the personnel within a given process, in accordance with their particular sequence;
  - provide access to the data and documents required by these activities;
  - tracking all aspects of the process.
- The main goal of the work process management tools is to isolate the logic of the processes performed in the enterprise from all functions implemented within the application.

# The origins of work processes

- Document visualization (electronic documents)
- Automation of offices
- Document flow, automation of manual circulation of "case files" with "clearance slip"
- Document filing and processing systems
- Reinforced electronic mail
- Computer support of group work
- Distributed multi-system applications in client-server architecture
- Management systems and information management

# Business process reengineering

- The main catalyst of the area is **business process reengineering (BPR)**, a fundamental reflection and radical redesign of business processes for significant improvements in critical performance measures such as cost, quality and speed.
- They must be done before the computerization of the enterprise.

# Work process-related topics

- Reengineering / Redesigning Business Processes (BPR)
- Modeling of processes taking place in an enterprise
- Document Imaging Systems and Optical Character Recognition
- Computer Supported Collaborative Work (groupware)
- Human-Computer Interaction
- Technologies related to computer networks (LAN, Internet, ...)
- Logistic support for business processes
- Analysis, simulation, monitoring of processes and tasks
- Intelligent / mobile agents
- Behavior theory in a group
- Financial, sociological and other implications

# Technical concepts of work processes

## ● Workflow

- Defining in advance the sequence of actions required to complete a task.
- Automatically forward control and documents (resources) to the next operation after the previous one.

## ● Dynamic work management

- Assigning work to be done in a flexible manner, e.g. depending on the workload of the employees.
- The job is attributed to roles rather than to specific individuals.
- Assigning people to roles can change dynamically.

## Technical concepts of work processes (2)

- Prioritizing work. If performance depends on launching other work, meeting deadlines, or evaluating, it is necessary to prioritize the work on a regular basis.
- Dynamic change of process / work processes to take into account the unforeseen circumstances in their implementation.

# Technical concepts of work processes (3)

## ● Work tracking

- Easy to get information about the progress and current state of the task or tasks: downtime, delays, lack of workload, too many tasks waiting to be done.
- Enabling dynamic response to the above may interference in the course of work.

## ● Reports for administration and management

- Record of events occurring at the time of execution, preparation of reports, evaluation of efficiency, settlement of work, statistical surveys, setting of bottlenecks.

# Technical concepts of work processes(4)

- Reports for administration and management - *continued*
  - Monitoring the tasks:
    - determining and resolving irregularities (e.g. deadlocks)
    - consumption of time and other resources; the burden of office and computer infrastructure;
    - forecasting, supporting the planning of resources needed in the future;
- Simulation of work processes, e.g. to investigate their correctness before executing.

# Work processes Management Systems - current challenges

- There is no consistent and complete semantics
  - Process definition - subtle, but difficult to identify errors
  - How to communicate knowledge of processes
- Poor flexibility
  - Artificial extension of processes
  - High cost of implementation and maintenance
  - Complicated way of handling unusual situations
- Inadequate mechanisms for modeling and monitoring of quality parameters
  - Too 'sensitive' notification system
  - Information chaos
- High – cost integration with existing IT systems
  - Complex API
  - No direct access to the database
  - Limited support for transactions

# Work processes – research and development issues(1)

- Developing a universal, standard language for mapping work processes and any dependencies in work processes.
- End-user tools that allow you to easily define, modify, simulate, track, and control workflows.
- Interoperability: federated database access, schema integration, data warehousing, standards of interoperability, standardization of interoperability.
- Availability and scalability: the ability to build effective applications for thousands of geographically dispersed users.
- The traditional concept of transaction (ACID) is not sufficient as transactions in workflow systems can last for many days and cover many geographically remote locations. There are transactions that can not be reversed.

# Work processes – research and development issues (2)

- Exception Handling: It should be assumed that the designed work process is subject to interference. Work processes systems should provide exception declarations and their handling.
- Error tolerance: With a high number of components it is likely that some of them will fail. The system should be as insensitive to such situations as possible.
- Performance: efficient methods of optimizing work processes execution.
- Scalability: insensitivity to significant database volume extensions, parallel processing, number of users and participants.
- Methodology of design: efficient methods and techniques of transition from requirements to analysis, design and construction.

# Application of workflow systems

Easy

- Administrative work processes: include repetitive, predictable processes, with simple rules of coordination of tasks, e.g.:
  - sending messages between departments,
  - circulation and acceptance of statement of expenditure,
  - service and approval of business delegations.
- Ad hoc work processes: processes that incorporate elements of ongoing coordination and management, e.g.:
  - coordination of person activities
  - joint decision-making,
  - content creation for CMS,
  - product documentation,
  - processing of sales offers.

Complex

# Examples of fairly demanding work processes



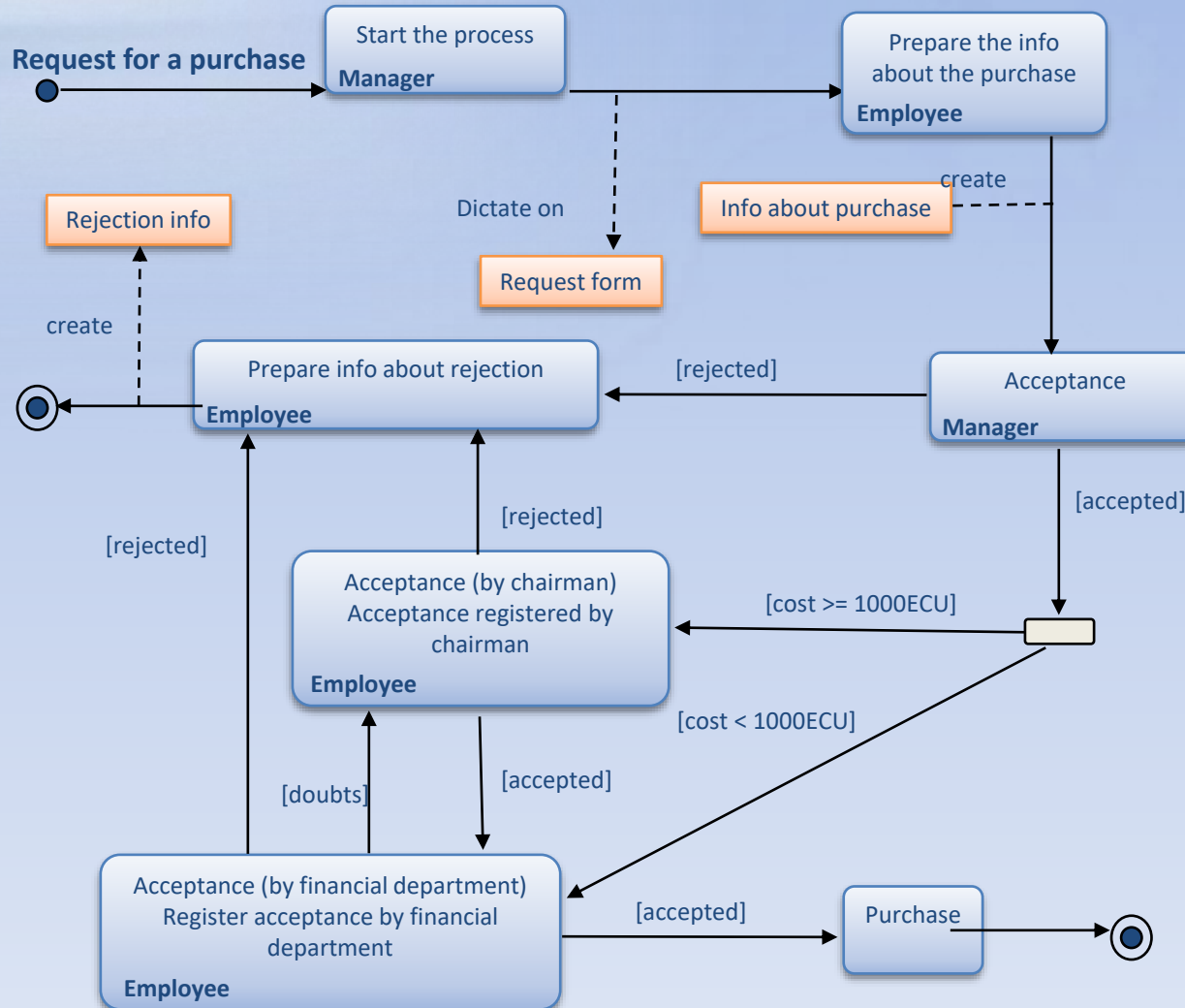
**Analyzing and accepting a bank loan application:** Coordinating the tasks performed by individual bank employees, such as accepting applications, risk analysis, security control, planning, drawing up and analyzing statements, reports, balance sheets, statistics, trends, requires coordination.



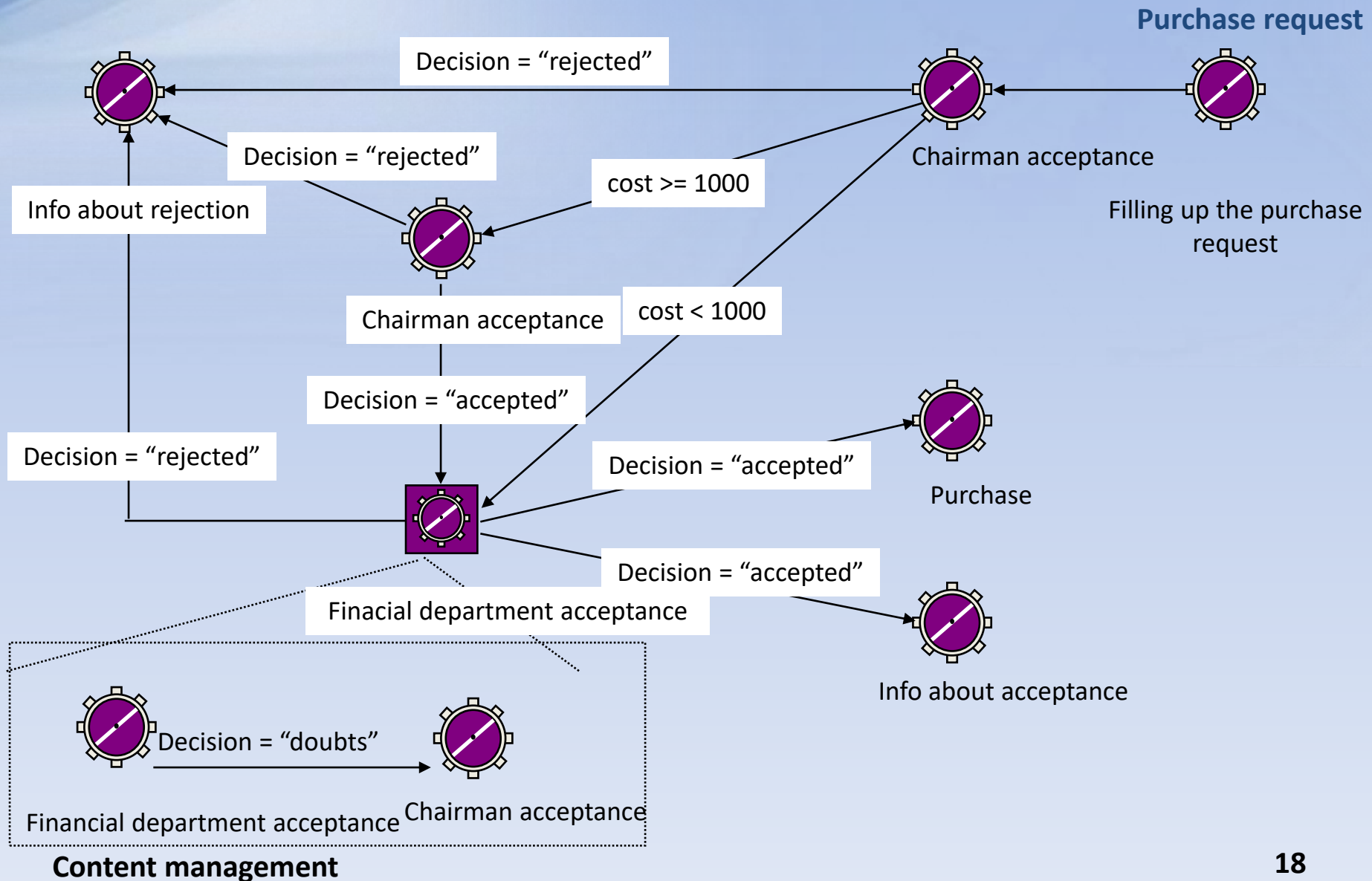
**Support for patient care in a health center:** coordination of tasks such as patient registration, appointment of physicians, registration of test results, planning of procedures, planning of laboratory tests and use of equipment, financial settlements, preparing and analyzing statements, statistics, etc.

# Example: dynamic model (UML)

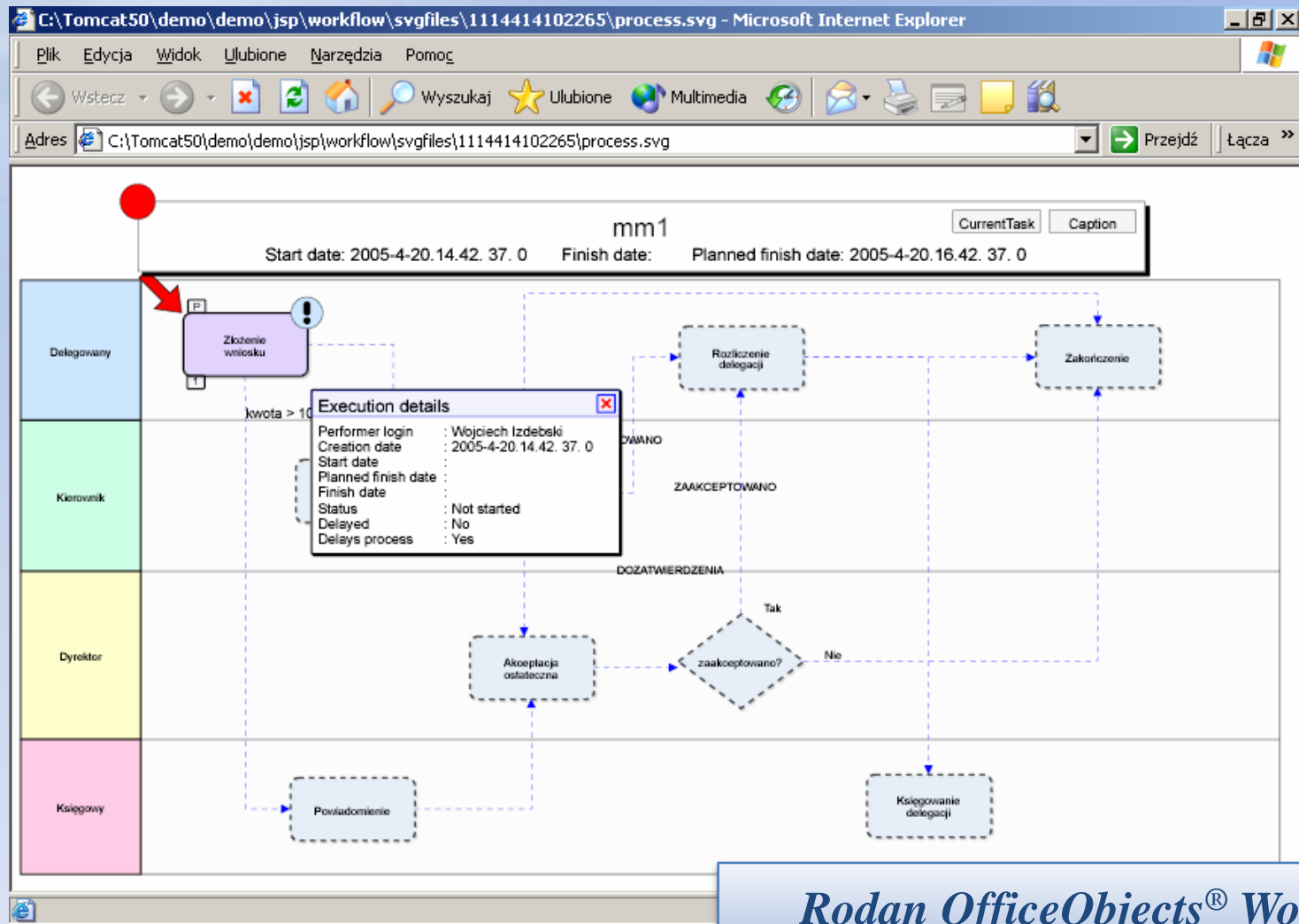
## Purchase request



# Example: process graph (FlowMark, IBM)



# Modeling of work processes



*Rodan OfficeObjects® WorkFlow*

# Characteristics of current work processes systems

- Emphasis on office processes: document visualization, document flow, enhanced e-mail.
- Many products offer no more than nice graphical coding programs (processes). These include support for drawing diagrams, database access, spreadsheets, simulation tools.
- Some of them are specialized data management systems: email, document visualization, databases, electronic forms, text storage and processing, engineering draft.
- It is common to put into one system:
  - managing documents and their images,
  - tools for building graphical interfaces,
  - some specialized tools (e.g. simulation).

# Conceptual architecture of work processes



## Tools for modeling business processes

- process perspective
- perspective of the organization
- data perspective
- re-engineering
- ...



## Tools for the development of work processes application

- graphics design tools
- designer workshop:
  - testing tools
  - simulation tools
- ...



## System and tools for work processes realisation

- planning software
- task manager / interfaces
- monitoring tool
- tracking tool
- reporting tool
- ...

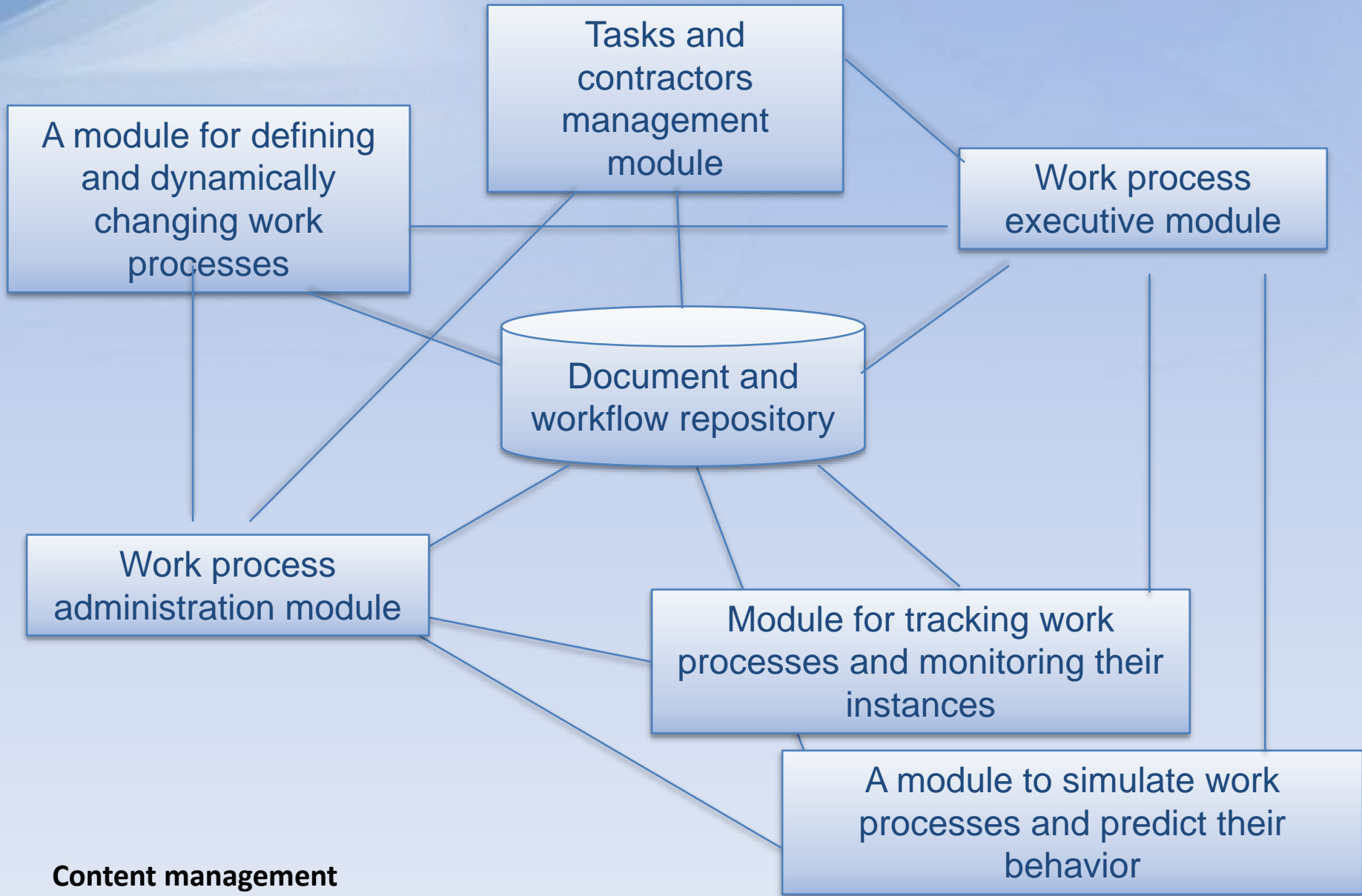
# Tools for the end-user

- Process representation in graphical form, where icons representing activities are associated in a network mapping control and document flow.
  - Ability to dynamically change the process graph.
- Defining table logic for non-programmers, process logic, priorities, validation rules, and other process conditions.
- The ability to recover in a clear, tabular or graphical form the current state of the process.
- Ability to simulate the process, allowing for easy detection of bottlenecks and errors in the definition of the process. Thanks to this, task allocation and process logic can be quickly checked and modified.
- Integrated access to external applications, such as editors, spreadsheets, databases, Internet services, etc., with the ability to share data.

# Work process systems: tools for programmers

- Script programming language for writing complex processing logic and having special functions for work processes:
  - Isolating the programmer from the complexity of manipulating graphics and forms,
  - Enables definition of queues, databases, documents, events, ...
  - Avoid programming in Java / C# / C / C++
  - Enables scripting output to code in Java / C# / C++ (with data passing to that code and vice versa).
- Connections to end-user tools that allow you to easily code common tasks.
- APIs for external software, especially for databases, Internet services, GUIs, distributed processing systems, expert systems,
- Debugging tools: syntax control, command tracing, step-by-step execution, checkpoints, and recovery of the current value of variables.

# Modules of a workflow system



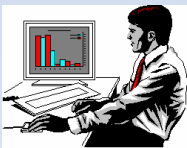
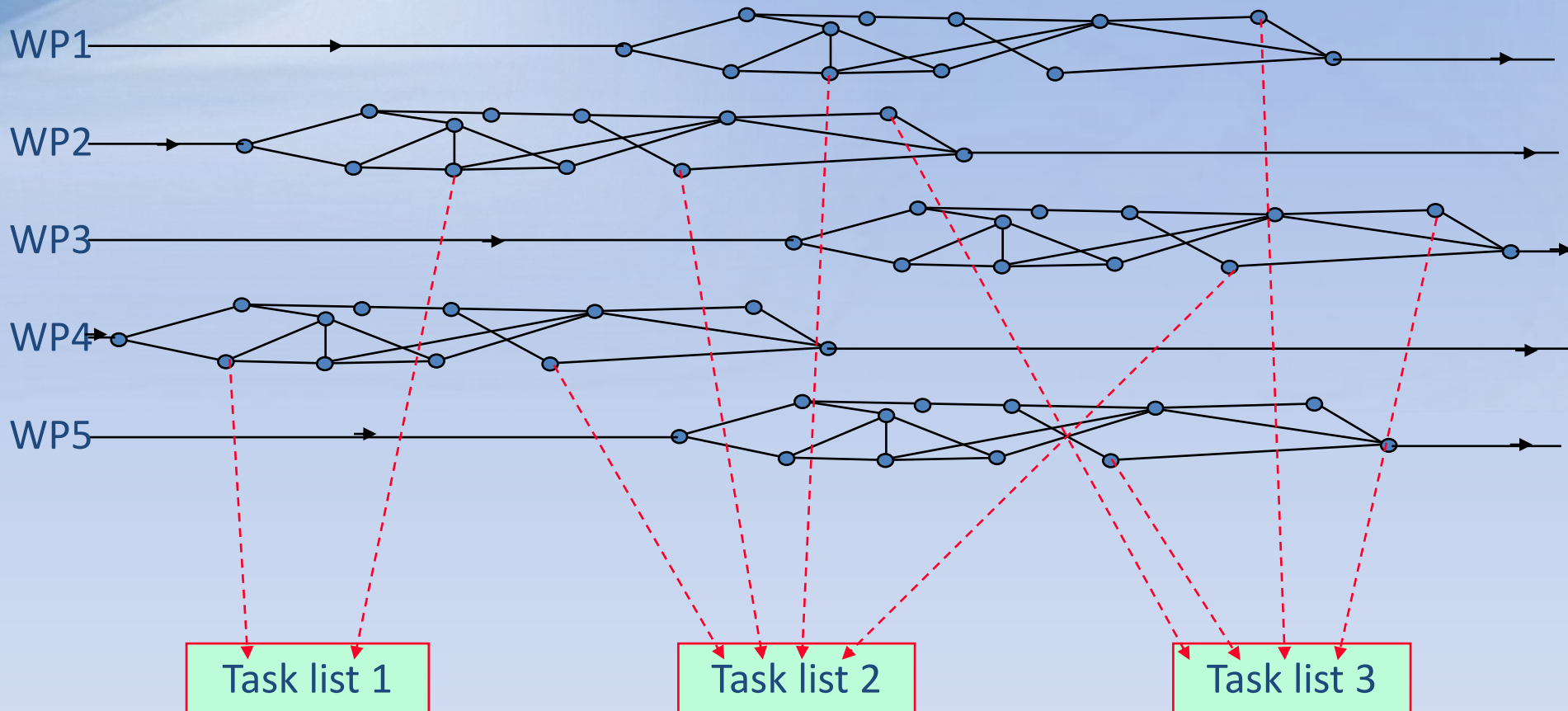
# Organisation modeling

- Modeling business dependencies and organizational units/departments;
- Static and dynamic definition of roles; assigning roles to people
  - Static: roles are pre-assigned to people
  - Dynamic: the manager can assign a role to a person; assignment is automatically based on the category (e.g. load of persons).
- Planning: assigning tasks / activities to roles and / or people

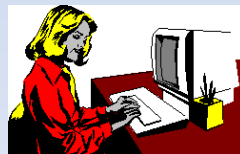
# Organisation modeling (2)

- Planning: assignment of responsibility
- Operational planning: changing job assignments, posting tasks, temporary changes in roles, responsibilities, or plans.
- Resource planning: budget, time, labor, office infrastructure, computer infrastructure
  - Resources used (time distribution, cross-section of tasks, etc.)
  - Planned resources (timetable, cross-section of tasks, etc.)
  - Unused resources (improvement of processes for their use)

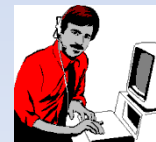
# Work processes and performers' tasks



Performer 1

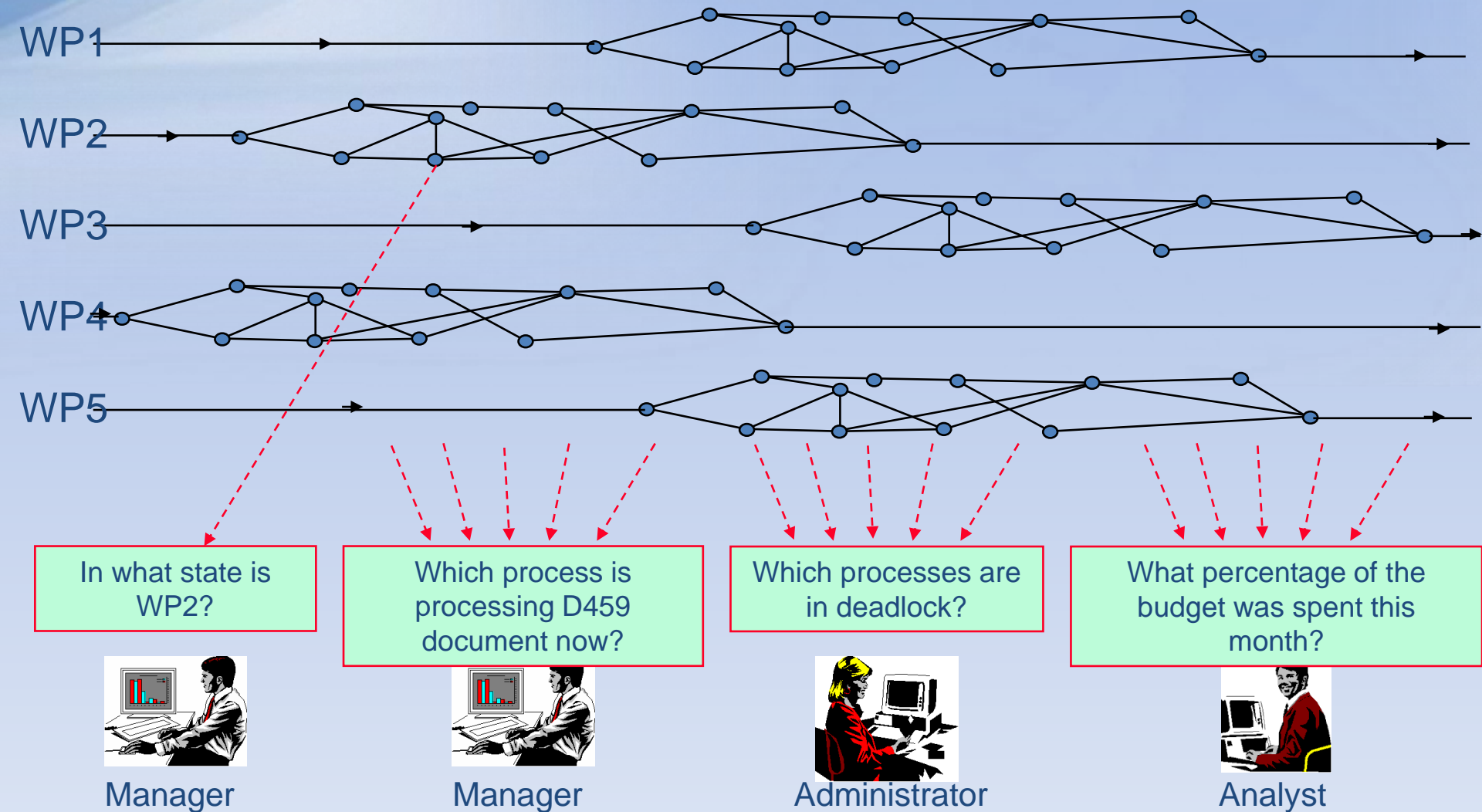


Performer 2



Performer 3

# Tracking and monitoring of work processes



# Standardisation: Workflow Management Coalition (WfMC)

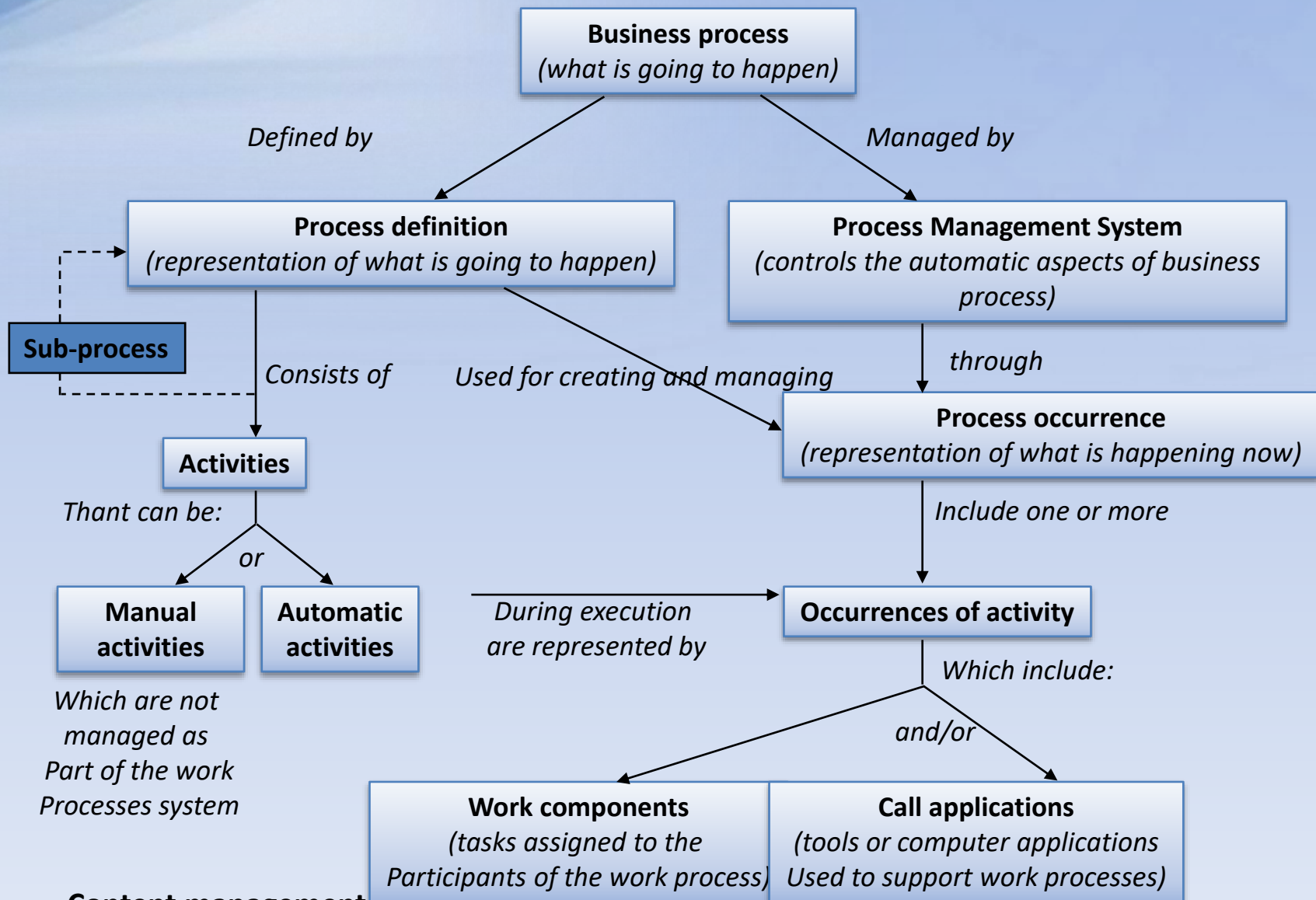


- Body founded in August 1993, about 200 members.
- 8 workgroups (related to five interfaces).
- Connections with other groups: Black Forest, OMG, Document Management Alliance; currently integrated with OMG (CORBA)
- Some standards:
  - Interface 1 - Process Definition Interchange WfMC-TC-1025: Version 1.14
  - Interface 2 - Workflow Client Application Programming Interface (Interface 2 & 3) Specification (WfMC-TC-1009 - Specification) V 2.0 (WfMC-TC-1013 - Naming Conventions) V 1.4.
  - Interface 3 - Invoked Applications now amalgamated into Interface 2, TC-1009.

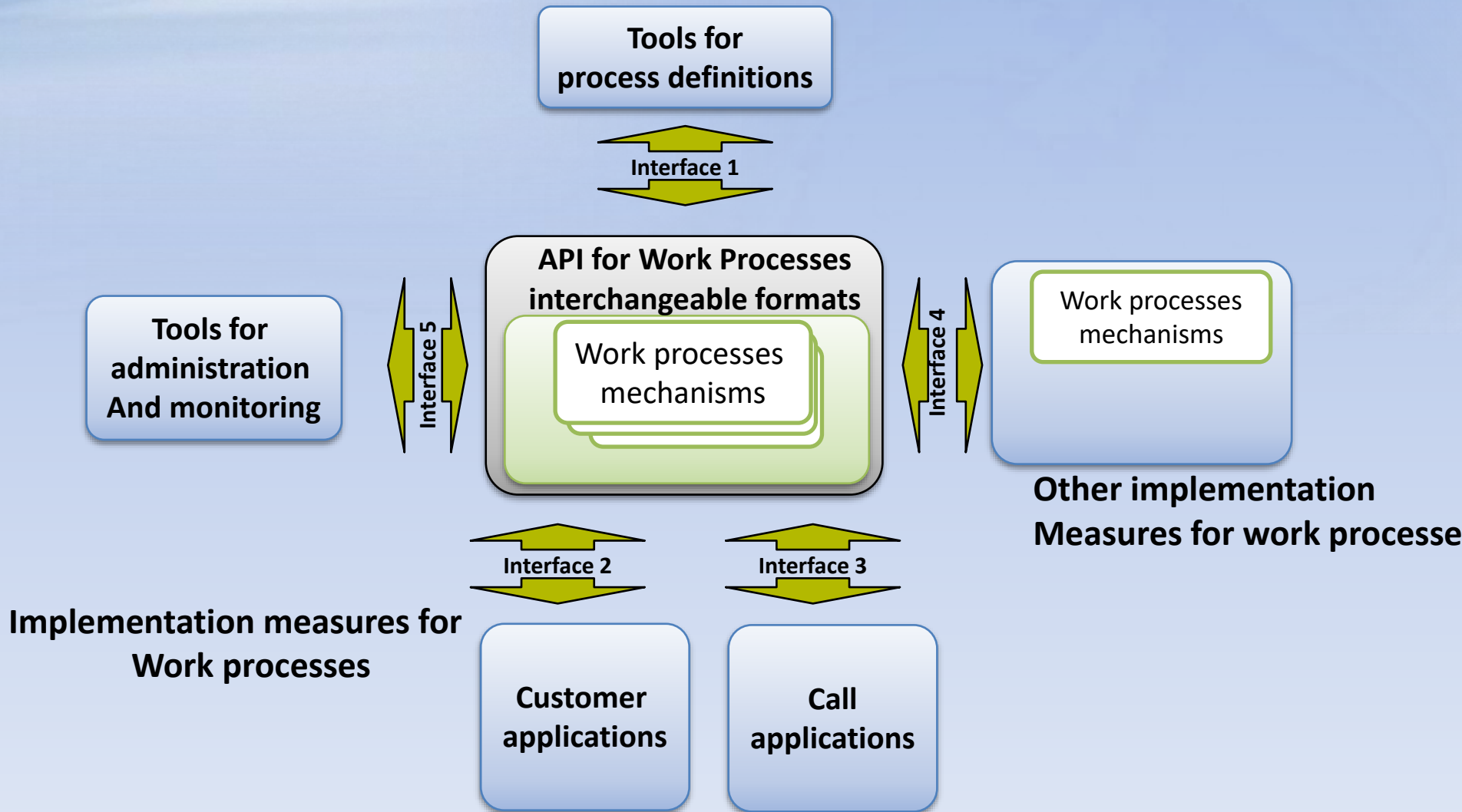
# Standardisation: Workflow Management Coalition (WfMC) (2)

- Interface 4 - Interoperability Wf-XML 2.0 (Current Draft)
- Interface 4 - Interoperability Internet e-mail MIME
- Binding (WFMC-TC-1018, 1.1f)
- Interface 5 - Audit Data Specification (WFMC-TC-1015, 22-Sep-98, 1.1)
- Interface 6 – OMG
- Interface 7 – Conformance
- Interface 8 – Reference Model

# Concepts of work processes, terminology



# Workflow Management Coalition (WFMC) Model



# Rodan OfficeObjects®WorkFlow

- Modern workflow management system on the example of Rodan OfficeObjects®WorkFlow
- Challenges for work processes management systems
- Assigning contractors
- Monitoring
- Architecture
- Modeling
- Life cycle of processes

Source: Rodan S. A.  
<http://www.rodan.pl>

# OfficeObjects® WorkFlow

## ● Semantics

- Workflow Process Metamodel
- Control flow and data
- Compliance with standards

## ● Flexibility

- Flexible assignment of contractors
- Dynamic co-operation of process participants
- Event handling

## ● Quality management

- Modeling and monitoring of quality parameters (time)

## ● Integration with IT systems

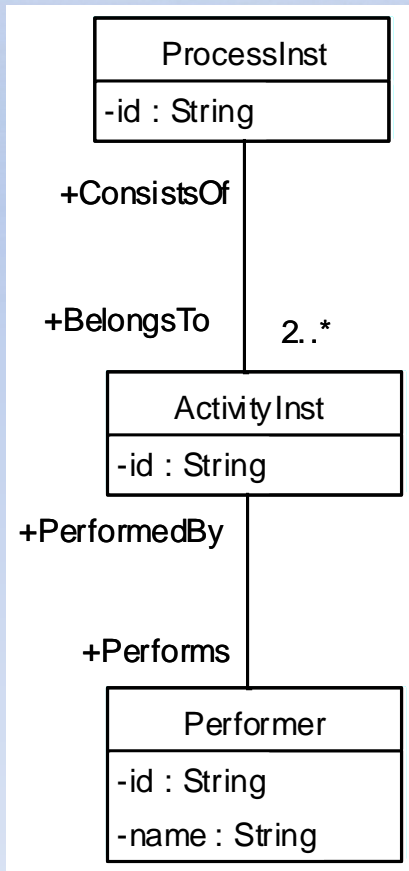
- Calling applications

# Metamodel processes - basic features

- OOWF - part of the IT system
- Metamodel extension proposed by WfMC [TC-1003]
- Main parts of the metamodel
  - Definition of the process
  - Process execution
  - Workflow environment (requirements for data, services and resources)
- Metamodel description levels
  - Conceptual (classes, relationships)
  - Detailed (Attributes, Pointers)
- Grade
  - Definition
  - Attribute specification
  - compounds
  - Model of behaviors

# Business Process Query Language

## ● BPQL – object oriented query language

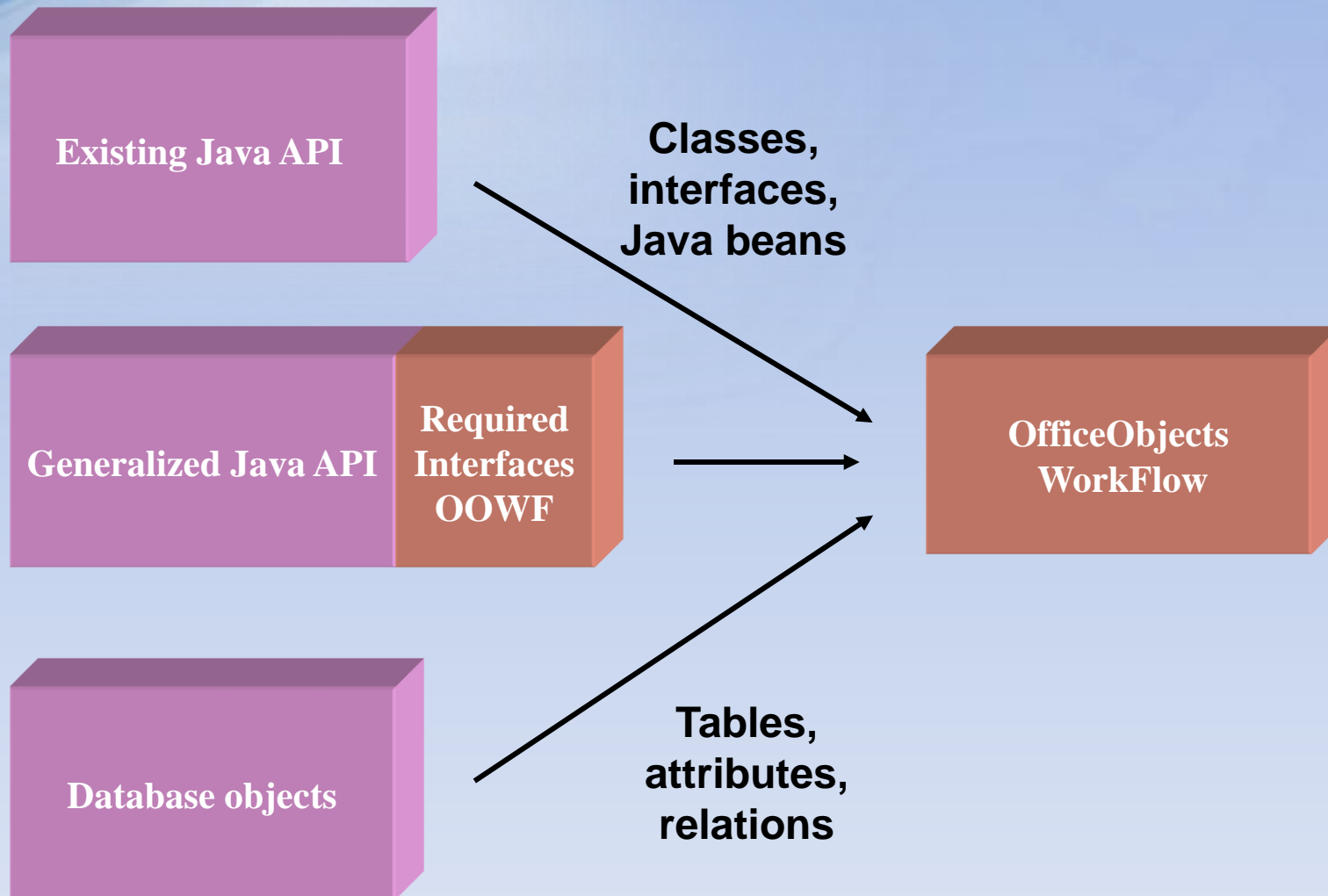


```
ProcessInst
ProcessInst.id
ProcessInst where (id='123')
(ProcessInst where id='123').ConsistsOf.
    ActivityInst
(ProcessInst where
    id='123').count(ConsistsOf)
ActivityInst where
    (PerformedBy.Performer.name = 'johnb')
StartActivityInst(ProcessInst where id =
    '123').id
((ProcessInst where id = '123') as P).
    (P.ConsistsOf.ActivityInst as
    A) .exists (A.PerformedBy.Performer.name
    = 'johnb')
```

# OOWF and workflow patterns (Aalst)

Workflow Patterns		OfficeObjects WorkFlow
Basic	1 (seq)	+
	2 (par-spl)	+
	3 (synch)	+
	4 (ex-ch)	+
	5 (simple-m)	+
Advanced Synchr.	6 (m-choice)	+
	7 (sync-m)	+
	8 (multi-m)	+
	9 (disc)	-
Struct.	10 (arb-c)	+
	11 (impl-t)	+
Mult. inst	12 (mi-req-s)	+
	13 (mi-dt)	+/-
	14 (mi-rt)	+
	15 (mi-no)	+
State	16 (st-f-s)	
<b>More examples: <a href="http://www.workflowpatterns.com/patterns/">http://www.workflowpatterns.com/patterns/</a></b>		
Cance	20 (can-c)	+

# Data container - access method



# Workflow Participant Assignment (WPA)

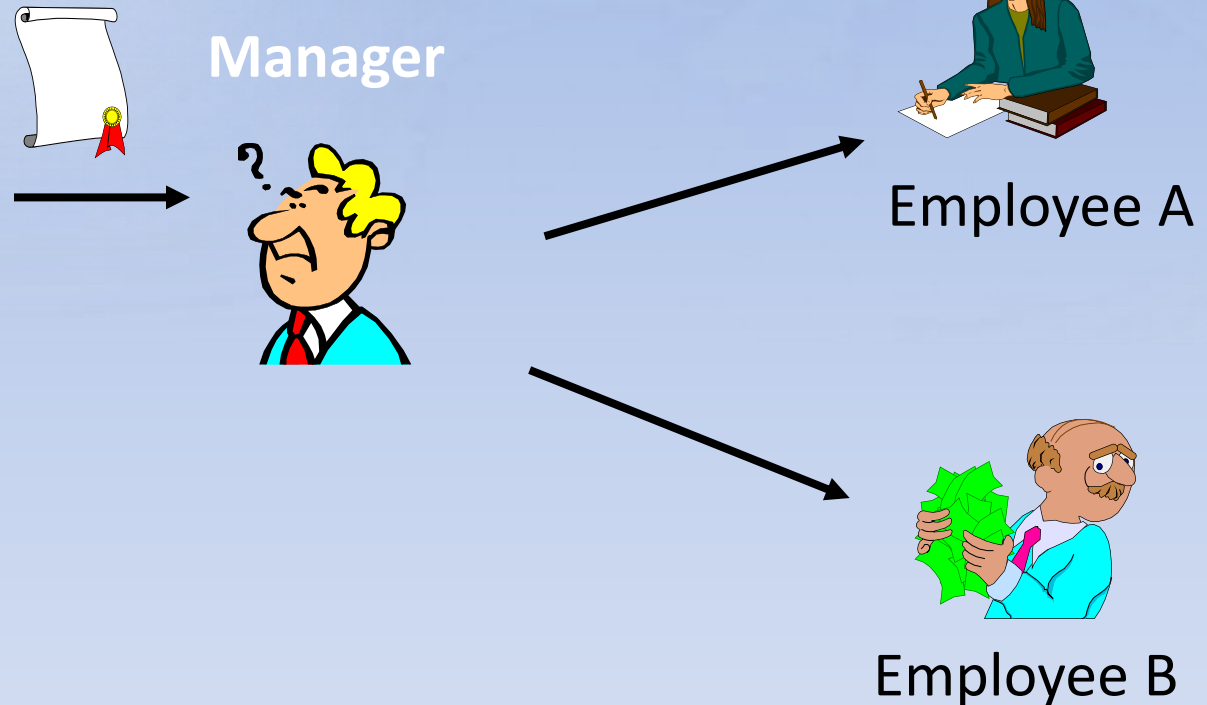
- Basic requirements: assigning performers
  - Static: particular users,
  - Dynamic:
    - Groups, organizational units,
    - Roles, competencies,
    - The history of the execution of the process (who, when),
    - Other, more complex.
  - Many performers.
  - Selection of ad-hoc performers.

# Flexible assignment of performers ad-hoc decision

A complaint came. .

Who will take care of it?

How to express this in the complaint handling process?

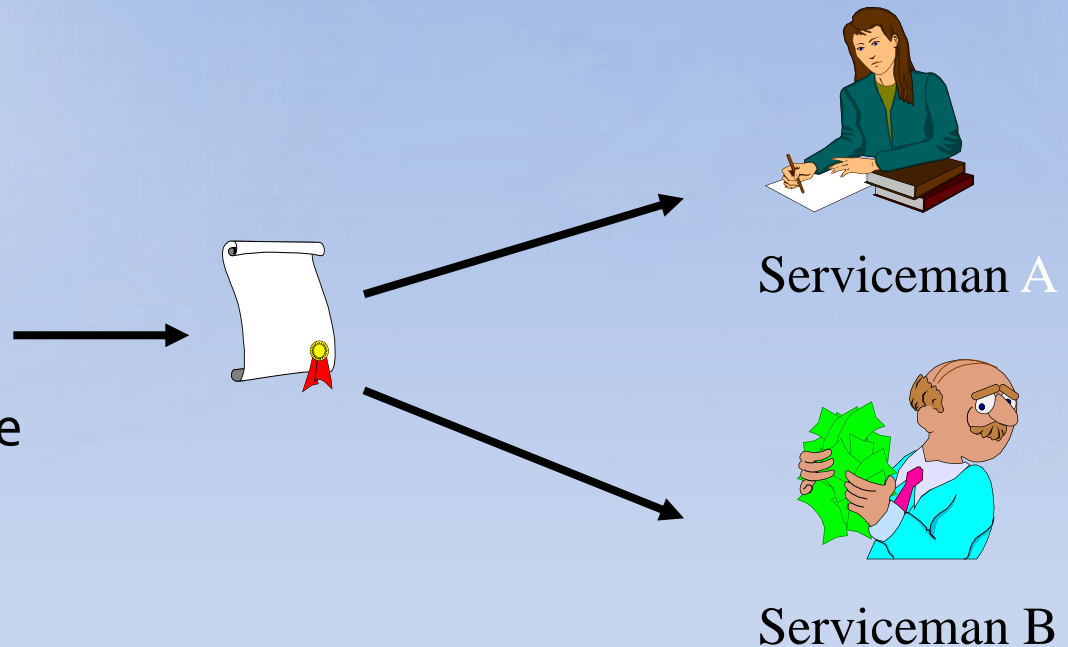


Making a decision during the implementation of the decision, whoever of the selected user group (defined during the process definition) will perform the action (ad-hoc decision).

# Flexible assignment of performers who is first

A complaint came...

Somebody in the service department should take care of it.



- Performing the action by the person of the selected user group specified during the process definition. The person who first wants to do it is the person who performs the task.

# Flexible assignment of performers to the submitted conditions

- Java i XML expert:

$$A = \text{Expert}(\text{'JAVA'}) * \text{Expert}(\text{'XML'})$$

- Java i XML expert, but not Mr. Jan Problem:

$$B = A - [\text{'Jan Problem'}]$$

- the person who performed the previous action or started the process:

$$C = \text{Participant}(\text{PrevActivityInst}) + \text{Participant}(\text{StartActivityInst})$$

# Event management

- Requirements:

- Handling of external events
- Expressing complex relationships between processes
- Response of the IT system to the events related to the process support

- Concept - event

- Generated by IT systems
- Generated by OOWF
  - As specialized activities
  - Internal workflow objects (behavior models)
- Specialized activities
  - Sending an event
  - Receive an event

# Modeling and monitoring time limits

## ● Current requirements:

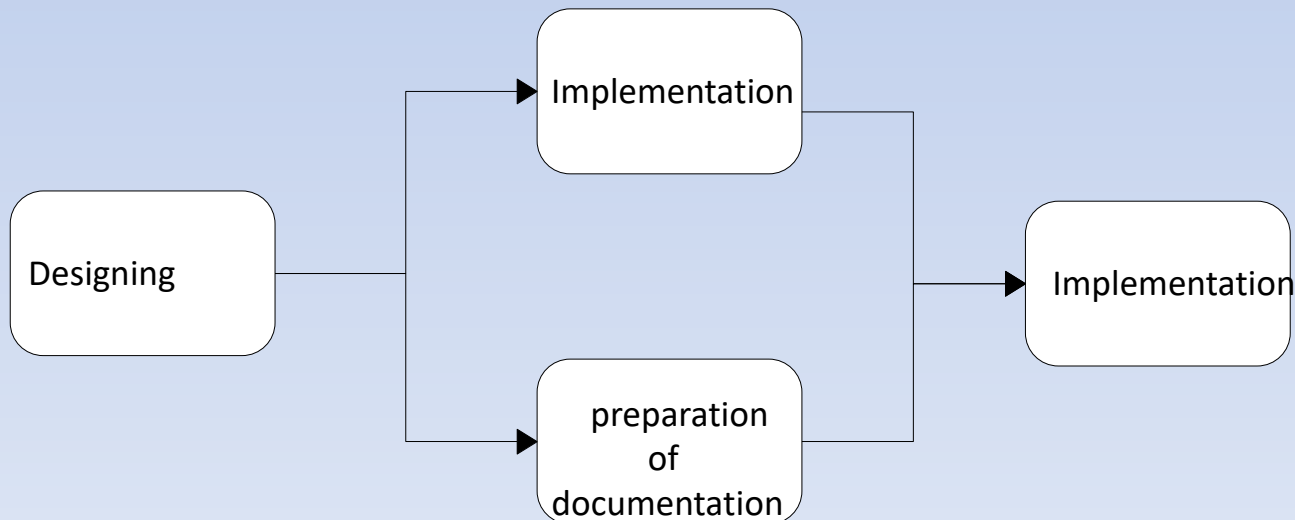
- Dynamic change of time limits
- Anticipating possible delays
- Early and appropriate delay signaling

## ● Concept: time management (e.g. ePERT)

- Term of completion, duration
- Delayed action
- The operation delays the whole process
- The choice of people notified about delays - WPA

# Time management - example

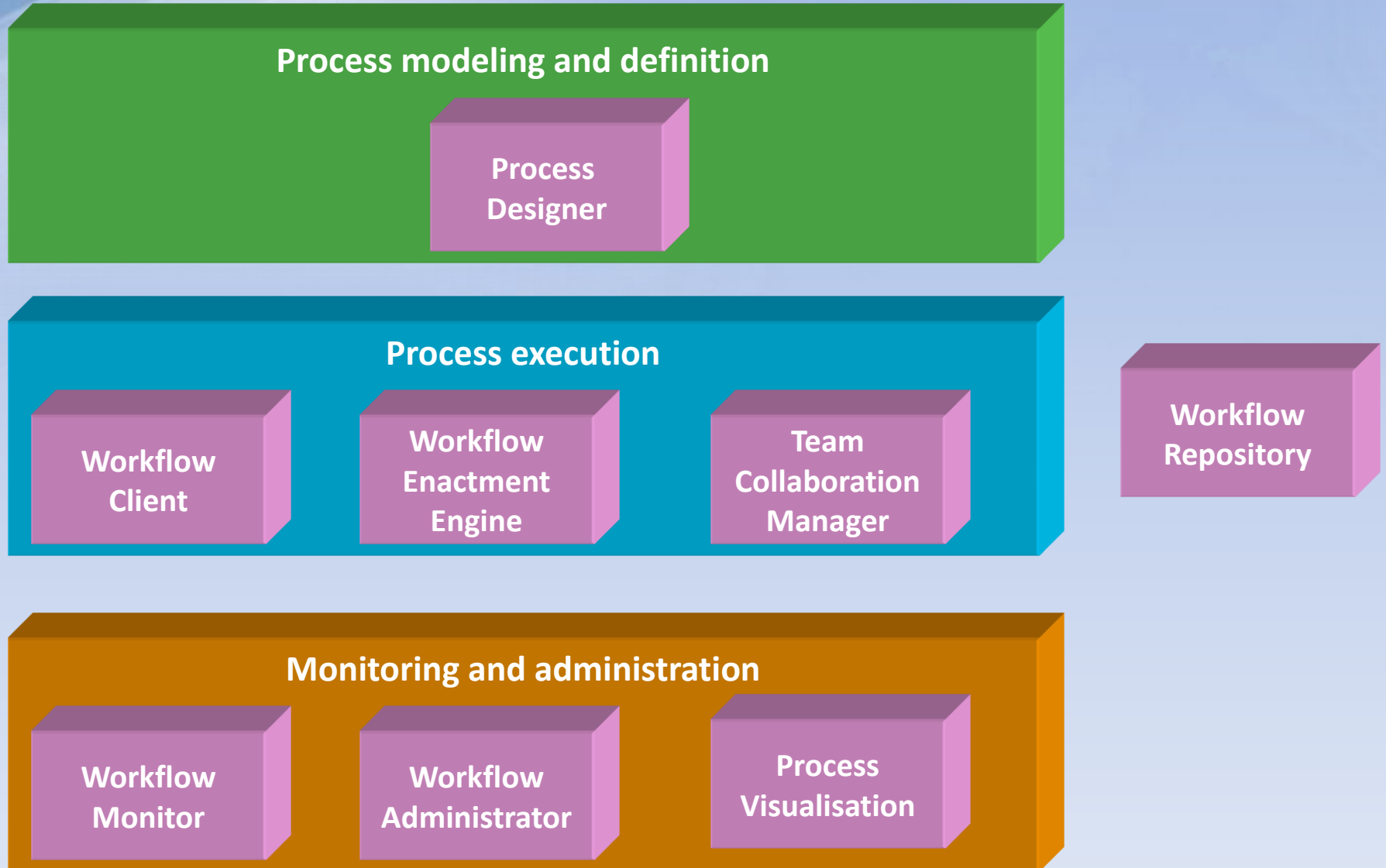
- Document preparation takes 5 days - action is delayed but does not delay the process
- Implementation takes 21 days - action is delayed and process is delayed (critical)



# Signaling delay

- To-do list
- Process execution history
  - Text
  - Graphic
- Notifications
  - The action is delayed
  - Process is delayed (action delays the process)

# Functional architecture



# Modeling and defining processes

- Process Designer
- Modeling
  - OOWF custom tool (extended BPMN notation)
  - External tools (XPDL, BPEL)
    - iGrafx
    - Aris Toolset
    - Corporate Modeller
    - MS Project
- Definition (detailing the process)
  - Actions - assignment of performers, applications, parameters
  - Control flow (separation and connection components, control flow conditions)
  - Non-functional constraints (time)
- Verifying and sharing processes

# Process execution

## ● Workflow Enactment Engine

- Run the process instance
- Follow the process as it is defined
- Selection of performers, evaluation of conditions
- Event processing

## ● Workflow Client

- Manual tasks - task list
- Automatic tasks - agents

## ● Team Collaboration

- Dynamic co-operation between performers
- Thread, Message, Reply

# Monitoring and Administration

## ● Workflow Monitor

- Monitoring of non-functional constraints (time)
- Notifications

## ● Workflow Administrator

- List of process instances
- List of action instances
- Search, Terminate, Suspend, Resume, Modify, Reassign

## ● Process Visualisation – process history

- Text
- Graphic

# Process repository

## ● Process definition

- Action (Atomic, Routing, Compound)
- Assigning performers
- Specification of the application call
- Transitions
- Events

## ● Process instance

- Action instance
- Performer
- Application call
- State
- Passing instance

## ● SQL, JDBC

# Example of a work process - text description

- An example process concerns the handling of delegations. A delegation form can be filed by any employee of the company. For simplicity we assume that the applicant is also a delegated person. Once the application is completed, it is subject to approval by the direct supervisor. The immediate superior can: a) accept the request, b) reject the request, c) send the request for approval by his superior. In case (a), the accepted application is sent to the delegate to complete the costs actually paid after the return from the delegation. In case b) the delegate is informed about the cancellation of the application. In case, c) the application is subject to re-acceptance by the supervisor of the person being the immediate superior of the posted person. Similarly, the superior may take the following decisions: a) accept the application - then it is settled by the delegate, b) cancel the request - then the request is canceled and the information is sent to the delegate. After the settlement of the delegation, it is sent to the accounting office for posting the delegation and for the delegate.

# Example – work process modeling

## Roles:

- Delegate
- Manager
- Director
- Accountant

## Steps:

- Submission of the application
- Pre-acceptance
- Final approval
- Settlement of the delegation
- Posting the delegation
- End

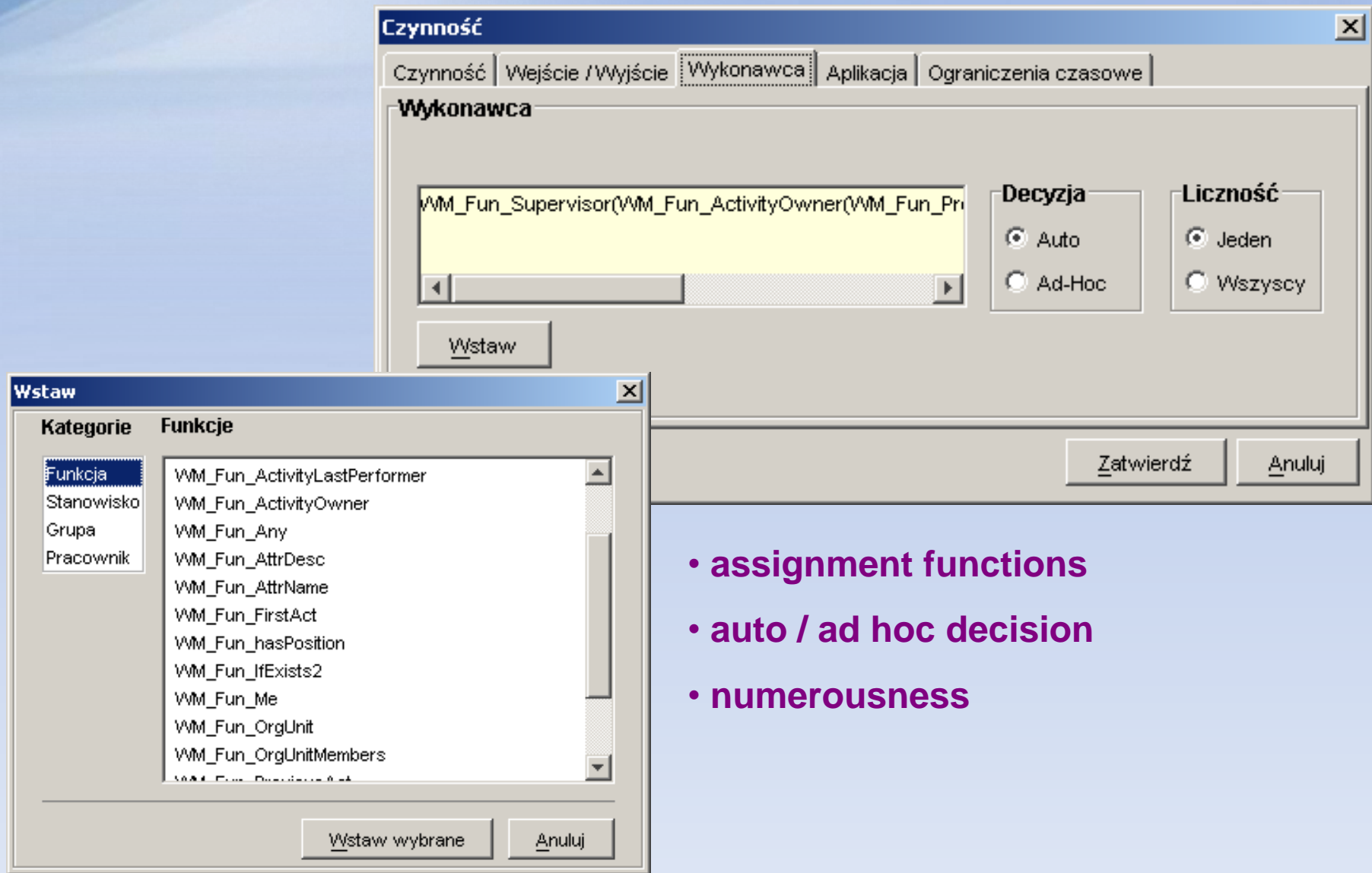
## Control Flow:

- Decision-making
- Transitions

# Defining - performers

- Decision - determines whether the performers will be automatically selected according to the BPQL (Auto option), or the executor of the previous operation will manually determine who performs the action (Ad-hoc option).
- Multiplier - determines whether only one candidate (option One) is selected from the candidates specified by the BPQL Expression or all candidates (All option) as the executor of the action.
- The expressions used in the BPQL language are used by the performer
  - dictionary data
  - built-in BPQL functions

# Defining – performers (2)



- assignment functions
- auto / ad hoc decision
- numerousness

# Example of performer designation

- `WM_Fun_Supervisor(WM_Fun_ActivityOwner(WM_Fun_PreviousAct())) /\ WM_Fun_OrgUnitMembers('english language')`
- The performer has to be:
  - supervisor (WM\_Fun\_Supervisor)
  - the person performing the action (WM\_Fun\_ActivityOwner)
  - previous action (WM\_Fun\_PreviousAct)
  - and at the same time (/\\)
  - this person has to know the English language(to be a member of a competence group - English proficiency)  
(WM\_Fun\_OrgUnitMembers('English language'))

# Defining - calling the application

- Application Name

- The name of the user interface element such as struts, Java Server Page, or Java Server Face (for manual actions)
- Java class implements WfExtApplication interface (for auto part)
- In some cases, the application name is a standard name used throughout the system, for example docman.

- Parameters - each parameter has a name, a type, and a value.

- Specifies whether this is an input or output parameter.
- For input parameters, the value is any text that can be interpreted by the application as text, number, or date. The value can also be a reference to a process attribute (an attribute name preceded by \$).
- For output parameters, the value is the name of the process attribute to which the parameter returned by the application will be written.

# Defining - time limits

- Determination of time limits (expressed in days / hours)
  - maximum execution time
  - deadline for implementation
- In relation to:
  - the whole process
  - individual activities
- Use WPA to identify the person / persons to be notified if a delay occurs

The screenshot shows a software window titled "Czynność" (Activity) with a standard Windows-style title bar. Below the title bar is a tabbed interface with four tabs: "Czynność", "Wejście / Wyjście", "Wykonawca", and "Aplikacja". The "Ograniczenia czasowe" (Time limits) tab is currently selected. The main content area of this tab is titled "Ograniczenia czasowe" and contains two distinct input sections. The first section, labeled "Maks. czas realizacji" (Maximum execution time), has two input fields: "Dni" (Days) with the value "0" and "Godz." (Hours) with the value "7". The second section, labeled "Maks. termin realizacji" (Maximum implementation deadline), also has two input fields: "Dni" (Days) with the value "3" and "Godz." (Hours) with the value "1". At the bottom right of the window, there are two buttons: "Zatwierdź" (Confirm) and "Anuluj" (Cancel).

# Defining - Flow conditions

- Determining flow condition:
  - BPQL expression
    - The ability to select a process attribute from the container
      - For example, the "accept\_wst" process attribute representing the pre-approval status
- Optional:
  - Name - condition text that appears on the process model
  - Description - the text describing the transition.

Nr	Od	Do	Nazwa	Warunek	Opis
1	3	8	ANULOWANO	\$accept_wst='2'	Wniosek został odrzucony.
2	6	7			Rozliczenie
3	3	4	DOZATWIERDZENIA	\$accept_wst='0'	Przekazanie wniosku do rozpatrzenia.
4	1	2			
5	4	5			
6	6	8			
7	5	6	TAK	\$accept_ostat='1'	Wniosek został zaakceptowany ostatecznie.
8	3	6	ZAAKCEPTOWANO	\$accept_wst='1'	Wniosek został zaakceptowany.
9	5	8	NIE	\$accept_ostat='0'	Wniosek został ostatecznie odrzucony.
10	2	3			

Przejdź

Od czynności: 3 - zaakceptowano?

Do czynności: 6 - Rozliczenie delegacji

Nazwa: ZAAKCEPTOWANO

Opis: Wniosek został zaakceptowany.

Warunek: \$accept\_wst='1'

Wstaw

AND NOT OR

Zatwierdź Anuluj

# Defining - verification and publication

- Verification - checking the completeness and consistency of the process definition, e.g. whether all activities were attributed to performers or whether passages formed the correct sequence of links, etc.
- Release - publishing the process. Immediate execution of tasks according to the shared definition.

OfficeObjects@WorkFlow - Narzędzie Projektanta

Proces Czynność Przejdź Kontener Wygląd Pomoc

Utwórz Ctrl+N  
Zrezygnuj z modyfikacji  
Usuń wersję  
Weryfikuj Ctrl+V  
Udostępnij  
Modyfikuj Ctrl+B  
Importuj Ctrl+I  
Eksportuj Ctrl+E  
Zapisz grafikę...  
Drukuj  
Odśwież  
Zakończ Ctrl+Q

Definicja Model

Nazwa Szkolenie Delegacja

Priorytet LOWEST

Wersja 3

Opis Szkolenie Wniosek Urlopowy

Min. czas realizacji

Dni Godz.

Maks. czas realizacji


Dni 0 Godz. 0

Kogo powiadom


# Process execution

- Components of the process:
  - Process instance,
  - Process instance state,
  - Process attributes,
  - Action instance,
  - Status of the action instance,
  - Performer,
  - Calling an application / subprocess.
- The task list is the primary interface for the execution of the process.

# Process execution - list of tasks



Zalogowany:   
Pracuje jako:


[wyloguj](#)

Zadania ▼
Procesy ▼
Narzędzia ▼
Pomoc ▼

1-10

Drukuj
Odśwież

	Zadanie	↑ Nazwa instancji procesu ↓	↑ Data utworzenia ↓	↑ Termin wykonania ↓		
<input type="radio"/>	Zakończenie	del ev 1				
<input type="radio"/>	Koniec	del ev gen 1				
<input type="radio"/>	Rozliczenie delegacji	del role 5				
<input type="radio"/>	Rozliczenie delegacji	del rol 4				
<input type="radio"/>	Akceptacja (wstępna)	del pow 1				
<input type="radio"/>	Powiadomienie	del pow 1				
<input type="radio"/>	ACT 1	del rol 1				
<input type="radio"/>	Zakończenie	del 31				
<input type="radio"/>	Rozliczenie delegacji	del as 30				
<input type="radio"/>	Zakończenie	del zda 2				

Wykonaj zadanie
Wskazówki

[respondencja](#)
[Dokumenty](#)
[Sprawy](#)
[Podmioty](#)
[Konfiguracja](#)

Dokumenty
Szukaj

Bieżące

	Zadanie	Opis korespondencji	Nr kanc.	Data rozpoczęcia	Termin wykonania						
	Stop										
	Zatwierdzenie										
	Praca nad decyzją		TK-8/06								
	Klasyfikacja i dekretnacja w komórce		TK-12/06								
	Klasyfikacja i dekretnacja w komórce		TK-10/06								
	Zatwierdzenie										
	Klasyfikacja i dekretnacja w komórce		TK-5/06								

K << >> P

Wyświetlono 1 - 7 z 7 10

# Monitoring of process instances

- Categorization of process instances

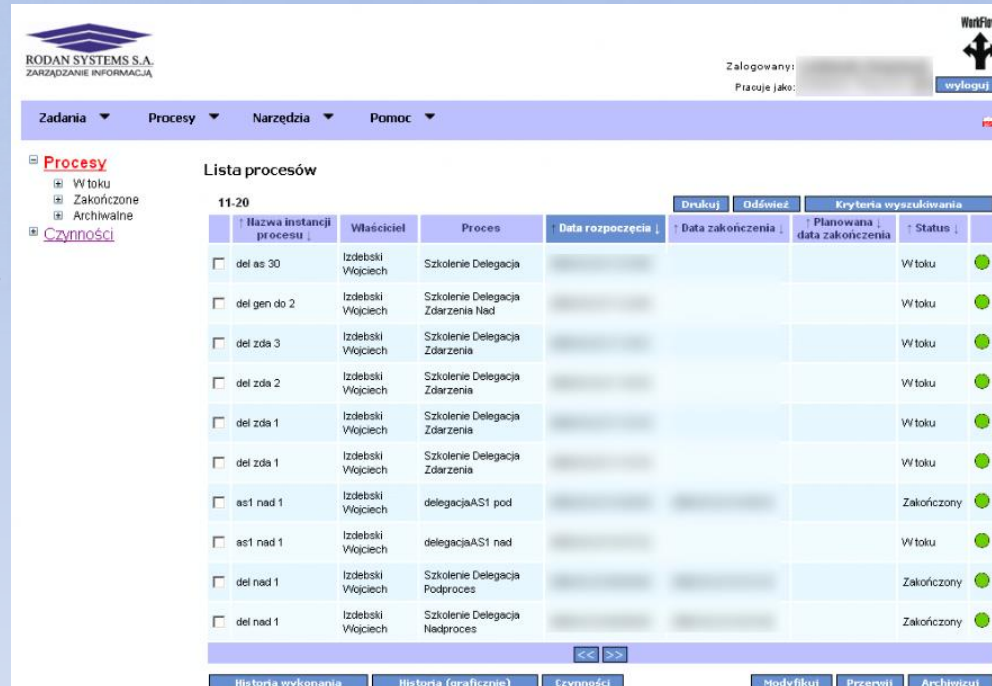
- Pending
- Ended
- Archive

- List of process instances

- Statuses

- Pending
- Completed
- Interrupted
- Archived

- The delay indicator in the form of an icon



The screenshot displays the 'Lista procesów' (List of processes) page in the RODAN SYSTEMS S.A. workflow management application. The interface includes a navigation bar with 'Zadania', 'Procesy', 'Narzędzia', and 'Pomoc' menus. A sidebar on the left shows 'Procesy' with sub-items 'W toku', 'Zakończone', and 'Archiwalne', and 'Czynności'. The main table lists process instances with columns for 'Nazwa instancji procesu', 'Właściciel', 'Proces', 'Data rozpoczęcia', 'Data zakończenia', 'Planowana data zakończenia', and 'Status'. The table is filtered to show 11-20 items. The status column uses green circular icons to indicate the state of each instance: 'W toku' (in progress) and 'Zakończony' (completed).

	Nazwa instancji procesu	Właściciel	Proces	Data rozpoczęcia	Data zakończenia	Planowana data zakończenia	Status
<input type="checkbox"/>	del as 30	Izdebski Wlojciech	Szkolenie Delegacja				W toku
<input type="checkbox"/>	del gen do 2	Izdebski Wlojciech	Szkolenie Delegacja Zdarzenia Nad				W toku
<input type="checkbox"/>	del zda 3	Izdebski Wlojciech	Szkolenie Delegacja Zdarzenia				W toku
<input type="checkbox"/>	del zda 2	Izdebski Wlojciech	Szkolenie Delegacja Zdarzenia				W toku
<input type="checkbox"/>	del zda 1	Izdebski Wlojciech	Szkolenie Delegacja Zdarzenia				W toku
<input type="checkbox"/>	del zda 1	Izdebski Wlojciech	Szkolenie Delegacja Zdarzenia				W toku
<input type="checkbox"/>	as1 nad 1	Izdebski Wlojciech	delegacjaAS1 pod				Zakończony
<input type="checkbox"/>	as1 nad 1	Izdebski Wlojciech	delegacjaAS1 nad				W toku
<input type="checkbox"/>	del nad 1	Izdebski Wlojciech	Szkolenie Delegacja Podproces				Zakończony
<input type="checkbox"/>	del nad 1	Izdebski Wlojciech	Szkolenie Delegacja Nadproces				Zakończony

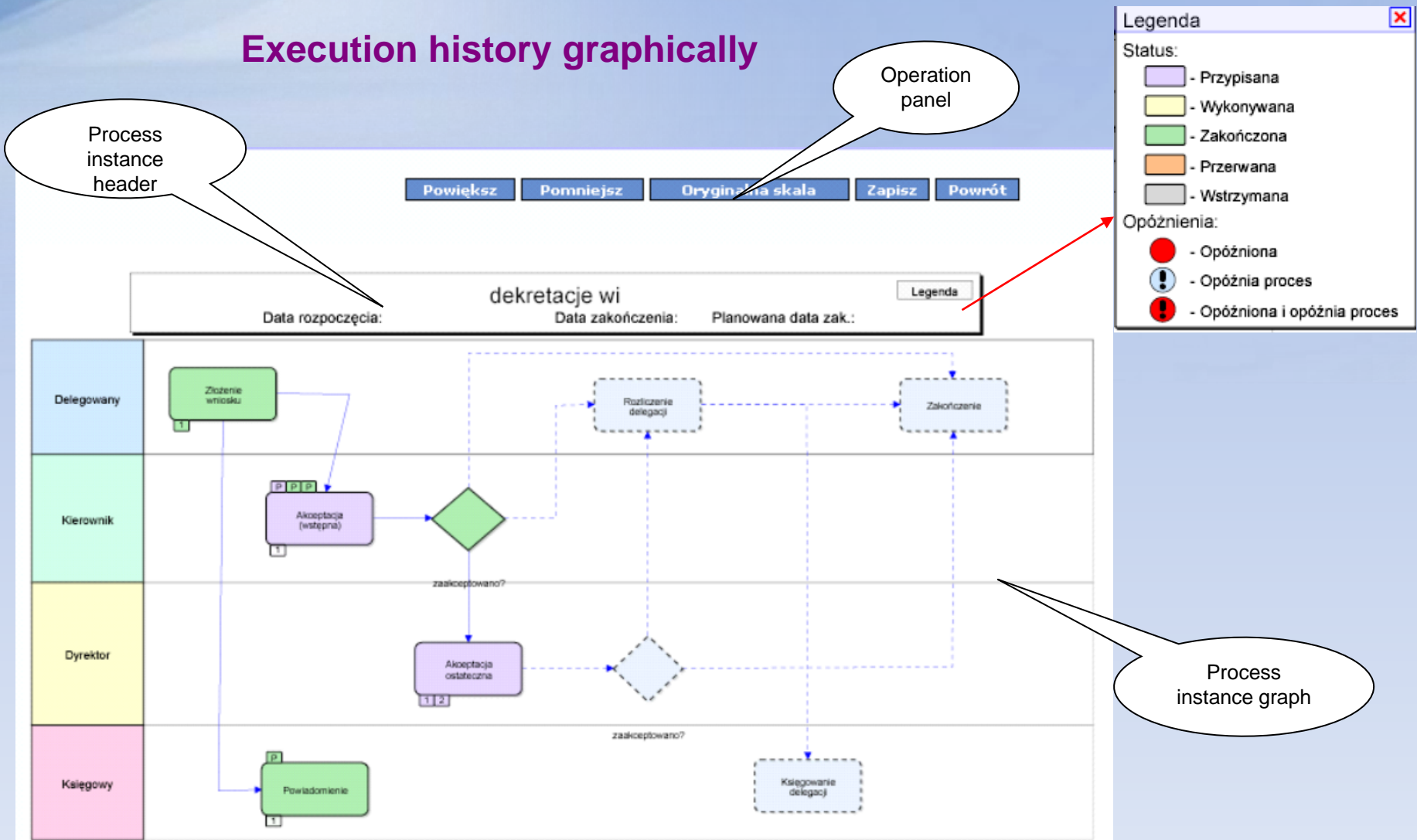
# Monitoring of process instances (2)

## ● Services

- Execution history - presents the history of execution of a process instance in text form
- Execution history graphically - presents the history of execution of a process instance in graphical form
- Modification - allows you to change the planned end date of the process instance
- Interrupt - aborts the current instance of the process
- Archiving - moves process instances to the archive (export to XML of process instances, all instances of actions, and transitions)
- Restore from archive - restore a previously archived instance of the process (restore based on the XML file describing the process of all instances of actions and instances of transitions describing the process)
- Actions - Obtaining information from instances of an instance of an activity

# Monitoring of process instances (3)

## Execution history graphically



# Monitoring action instance

- Categorize action instances

- Active
- Inactive

- List of action instances

- Statuses

- performed
- unclaimed
- completed
- stopped
- paused

- Delay indicator

- Actions - Obtaining information from instances of an instance of an activity

RODAN SYSTEMS S.A.  
ZARZĄDZANIE INFORMACJĄ

Zalogowany: [User Name]  
Pracuje jako: [User Name] [wyloguj](#)

Zadania ▾ Procesy ▾ Narzędzia ▾ Pomoc ▾

**Procesy**  
 W toku  
 Zakończona  
 Archiwalne  
**Czynności**  
 Aktywne  
 Nie aktywne

**Lista zadań**  
21-30

Zadanie	Wykonawca	Typ procesu	Kryteria wyszukiwania				Status	
			Data utworzenia	Data rozpoczęcia	Data zakończenia	Data rozpoczęcia		
<input type="checkbox"/> Zakończona	Izdebski Wojciech	Szkolenie Delegacja					Wykonywane	●
<input type="checkbox"/> Akceptacja (wstępna)	Izdebski Wojciech	Szkolenie Delegacja					Zakończona	●
<input type="checkbox"/> Złożenie wniosku	Izdebski Wojciech	Szkolenie Delegacja					Zakończona	●
<input type="checkbox"/> Rozliczenie delegacji	Izdebski Wojciech	Szkolenie Delegacja					Wykonywane	●
<input type="checkbox"/> Akceptacja (wstępna)	Izdebski Wojciech	Szkolenie Delegacja					Zakończona	●
<input type="checkbox"/> Złożenie wniosku	Izdebski Wojciech	Szkolenie Delegacja					Zakończona	●
<input type="checkbox"/> Zakończona	Izdebski Wojciech	Szkolenie Delegacja					Nieodebrana	●
<input type="checkbox"/> Koniec	Izdebski Wojciech	Szkolenie Delegacja					Nieodebrana	●
<input type="checkbox"/> Wypłata	Izdebski Wojciech	Szkolenie Delegacja					Zakończona	●
<input type="checkbox"/> Księgowanie delegacji	Izdebski Wojciech	Szkolenie Delegacja					Zakończona	●

Historia wykonania Historia (graficznie) Wskazówki Proces Modyfikuj Wycofaj Przerwij

# Monitoring action instance (2)

## ● Services

- Execution history - presents the history of execution of a process instance in text form
- Execution history graphically - presents the history of execution of a process instance in graphical form
- Tips - describes the description that was introduced when defining a process for creating a process definition
- Modification - allows you to change the deadline and change the person performing the action
- Rollback - causes the execution of a process to an instance of the task preceding the selected action (task)
- Interrupt - interrupts a given instance of an action
- Process - obtaining information from instances of process instances

# Summary

- Workflow technology is relatively young. It combines business concepts with issues related to tools, techniques, methods, languages, computer interfaces.
- The products of this technology integrate many techniques: programming languages, databases, distributed systems, concurrency, interoperability, GUI, video programming, document processing, transactions, Internet, active / mobile agents.
- The limits of this technology are very unclear up to now. It integrates many known technologies, in different proportions depending on the system.
- The quality is based on, for example: automation of onerous manual work.

# Summary (2)

- Contemporary systems for managing work processes are very complex and sophisticated applications.
- They support users at all stages of their work: from strategic modeling, conceptual implementation to deployment.
- Thanks to the implementation of many patterns, it is easy to design.
- Graphical user interfaces allow for easier management.
- Built-in programming languages make it easy to customize to your specific needs.