Computational task tracking complex in the scientific project informational support system

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Scientific project support system components

Informational unit

- Project and user registration;
- Event registration;
- Computation and resource consumption data accounting and analysis;
- Scientific results storage and analysis;
- Publication data accounting;
- Project management based on data analysis;

Technological unit

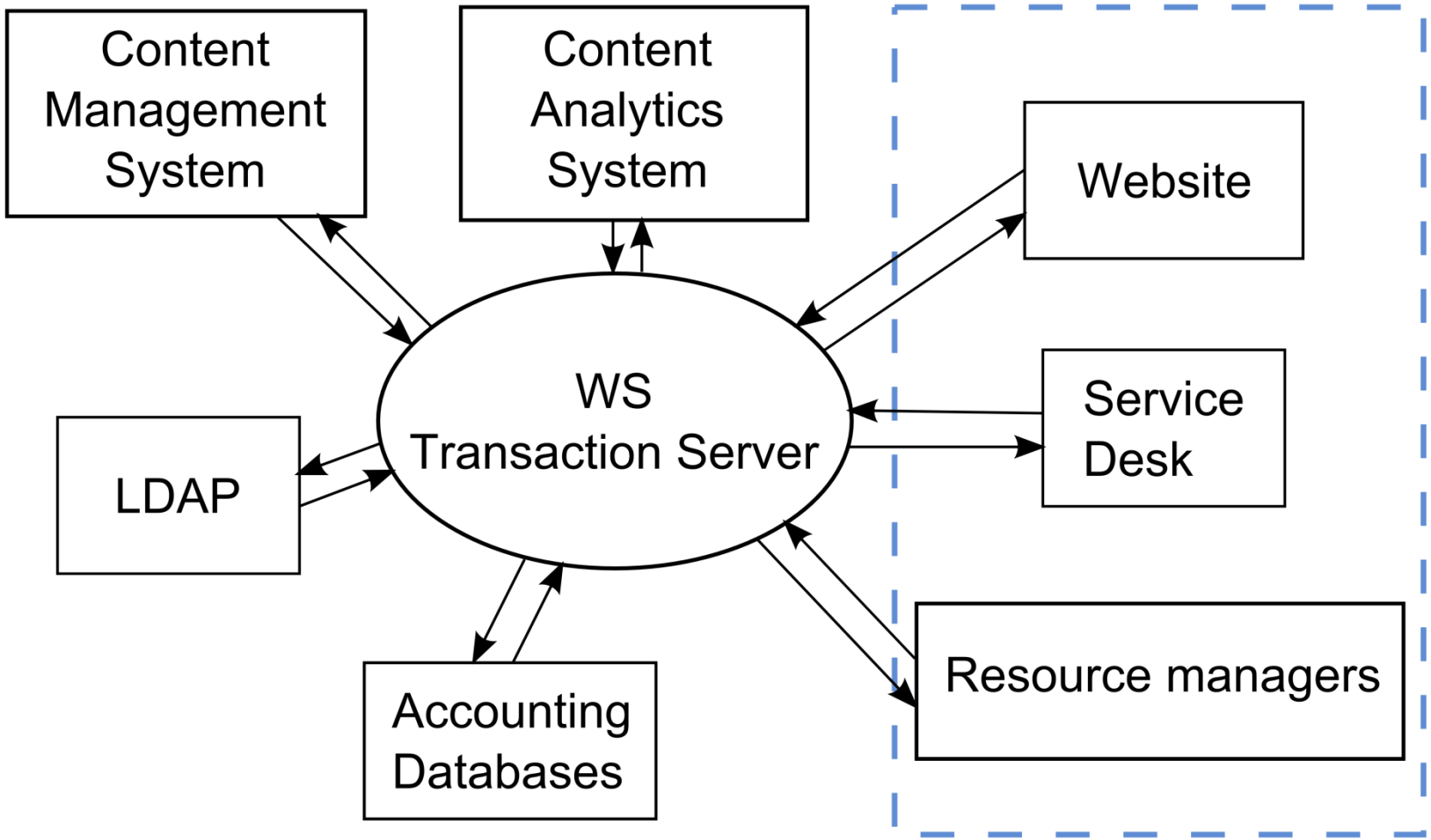
- Resource providing;
- Incident processing;
- Service request processing;

System of systems

- Modularity;
- Variety of I/O data of different subsystems;
- Flexible configuration of the connections between subsystems;

These principles lead us to use a web services as a basic connection element of support system

Scientific project support IS structure



Computation task tracking complex

The increase in computation capacity of numerical experiments

Increase in computation task quantity

Increase in priority of computational task tracking

Tracking complex consumers

- Scientific project participants:
  - performers;
  - governance;
- Supporting staff:
  - computing center staff;
  - computing center governance;

Requirements of scientific project participants

- review of own computational tasks with status and parameters;
- tracking of task execution success;
- graphical data representation preferred;

Requirements of scientific project governance

- review of all tasks of subordinates without details;
- generation of summaries of executed tasks and consumed resources;
- generation of reports about project;
- table data representation preferred;

Requirements of computing center staff

- review of all tasks in system with all available details;
- automatic reminding about incidents with computational tasks;
- generation of summaries of executed tasks and consumed resources in all projects;
- generation of reports about incidents with computational tasks;

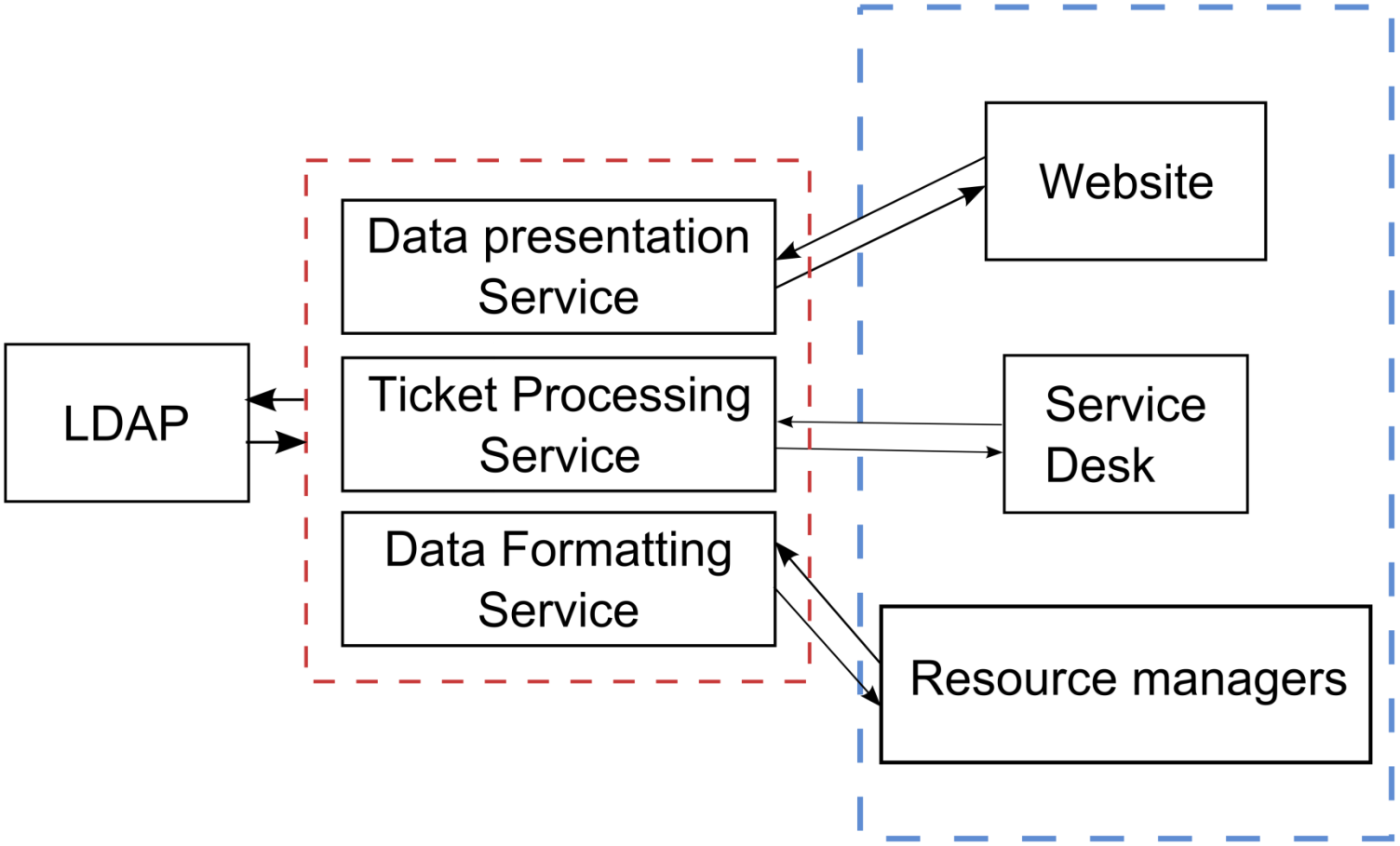
Requirements of computing center governance

- review of tasks is optional;
- generation of summaries of executed tasks and consumed resources grouped by project/computer;
- generation of a calendar reports with accent on a resource consumption;
- graphical and table data representation both are allowed;

Service desk as a central element of the support IS

- Basic system of the technical support:
  - incidents;
  - service requests;
  - knowledge database;
  - configuration management;
  - integration with monitoring services;

Task tracking complex architecture



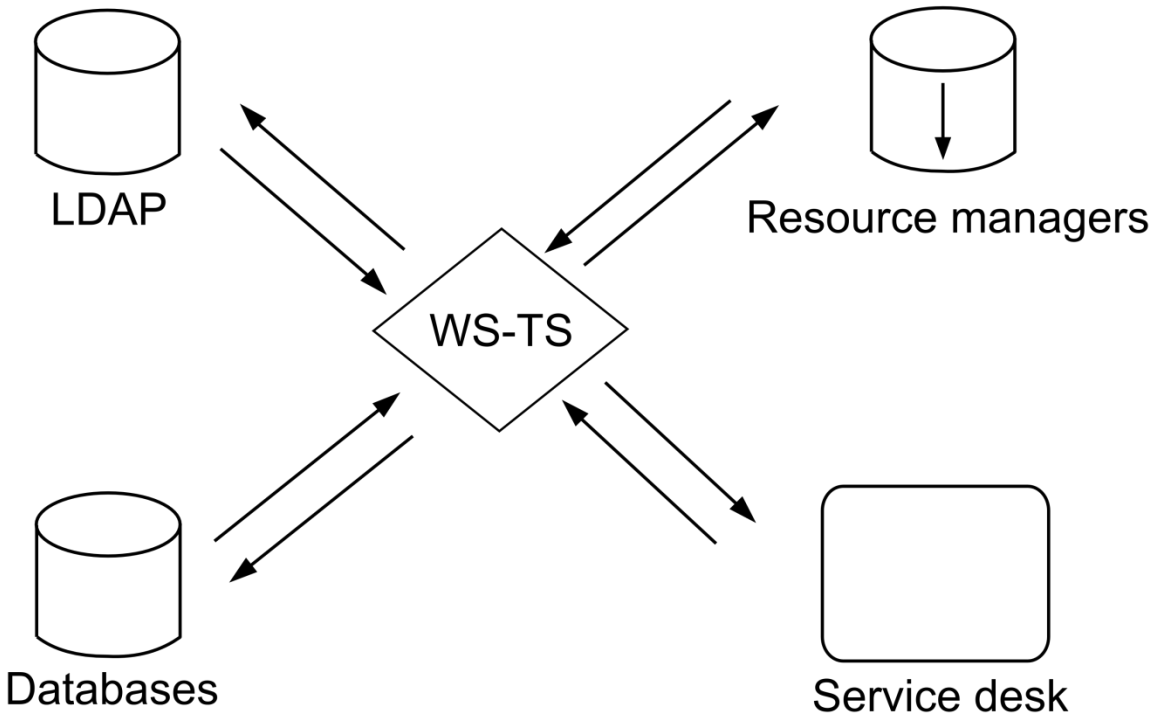
OTRS::ITSM service desk

- Non-commercial and open-source;
- Includes required objects and database;
- Supports all processes of technical support;
- Provides automatic report generation;
- Provides a web service API;

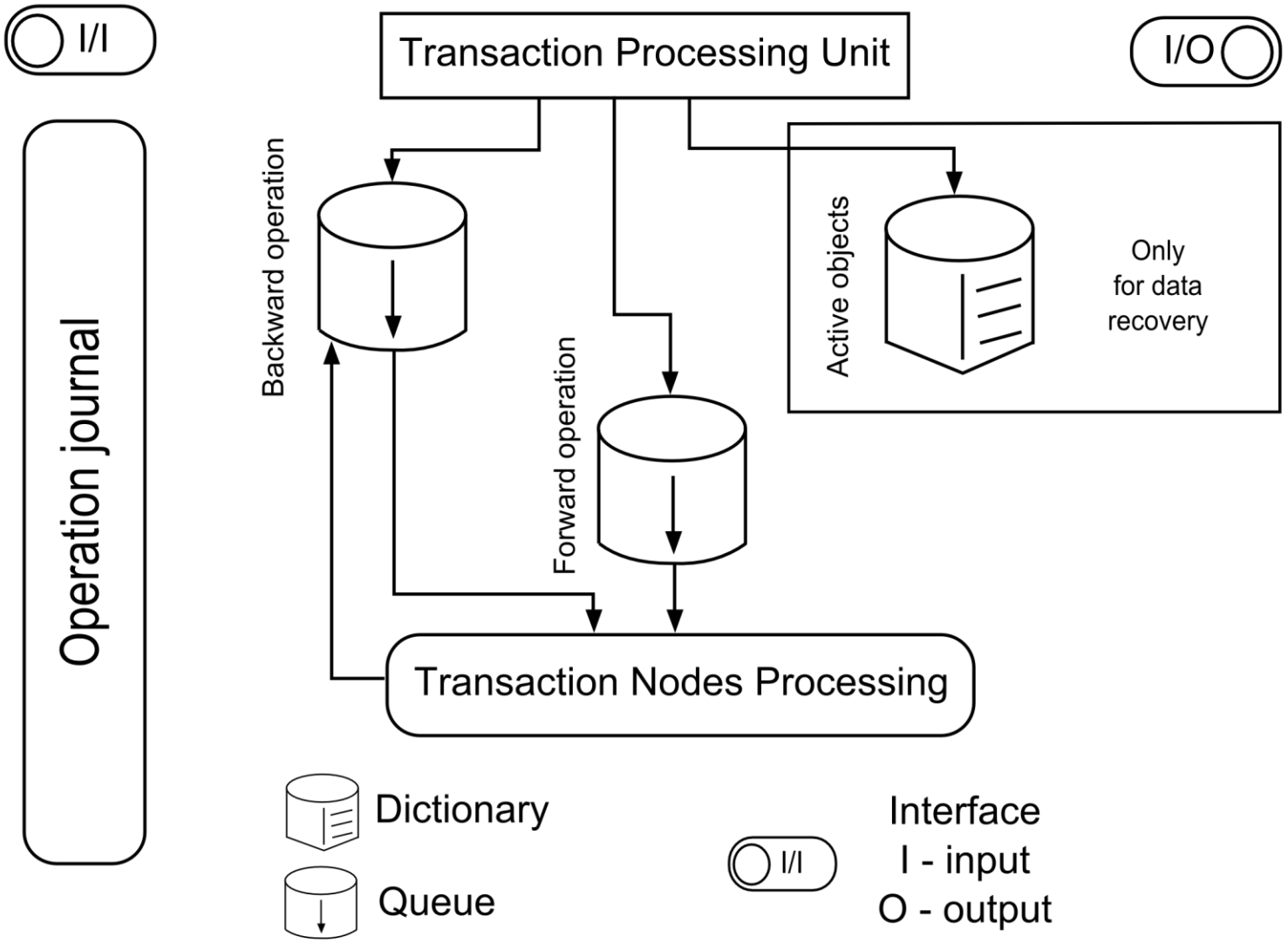
Web services

- Connection component of support IS;
- RESTful architecture;
- Reliability of services processing – reliability of scientific project support;
- Transaction system;

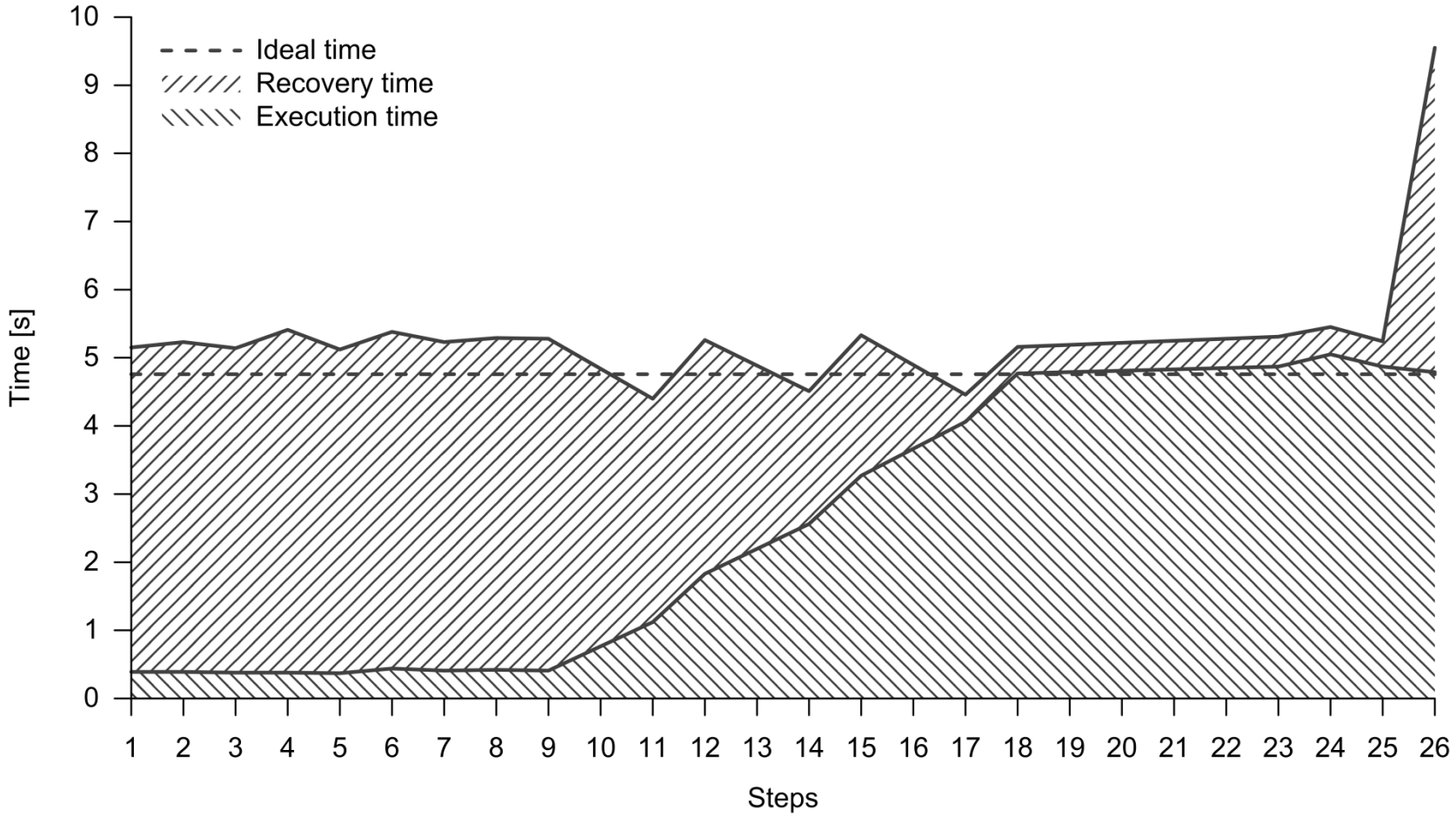
Transaction subsystem of the support IS



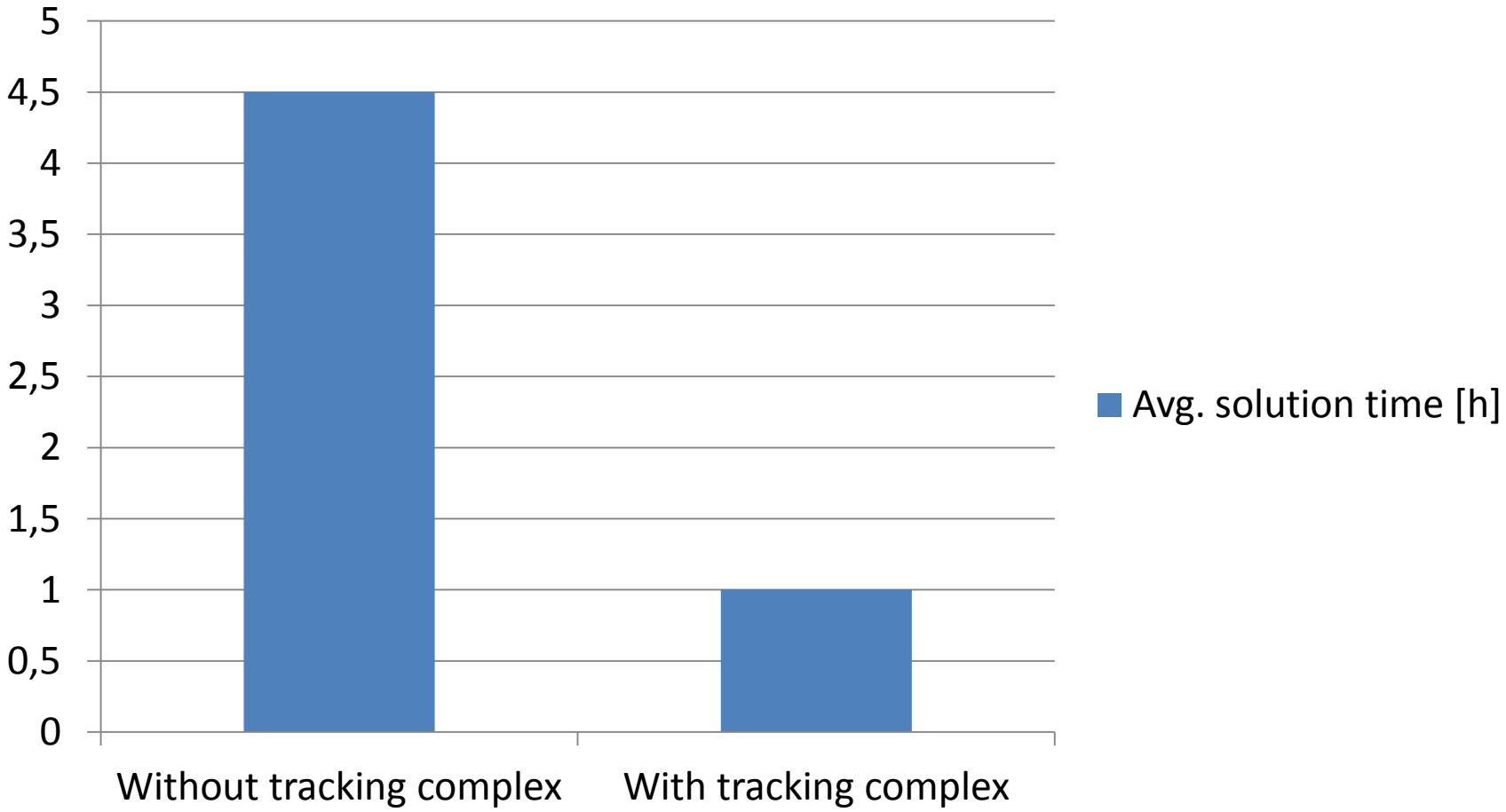
Transaction operation scheme



Broken transaction recovery efficiency



Incident solution time decrease



Conclusions

+ Appearance of a convenient way of tracking the computational tasks;
+ Reducing the time spent on the solution of the incident from a computational task;
+ Improving the reliability and performance of support system;
- Performance of the OTRS-based solution is not too high;
- Business process automation complexity;
- No united content management;

Perspectives

- From simple content management to ECM & BPM pair;
- Usage of resource managers with RESTful API;
- Closer integration with monitoring;
- Usage of unified accounting system for all resource managers;
- Installation of the data analysis system over the ECM system;

Thanks for attention