



Identifying and Understanding Stakeholders using Process Mining

Case Study on Discovering Business Processes that Involve Organizational Entities

NTT Software Innovation Center

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Agenda

1. Introduction
2. Approach
3. Tool
4. Case Study
5. Conclusion

Who is NTT?

NTT Group at Global

Formed from various technology companies, the NTT Group is one of the world's leading ICT companies. Managed from offices all over the world, the NTT Group's network provides customers with services, support and experts. It has consolidated sales of \$106 billion, 283,000 employees and more than 250 data centers.



All facts and figures accurate as of September 2018

Focusing Areas of NTT's IT Offering

Examples of Business Innovation & Growth Initiative

AI – Autonomics and Virtual Assistant

Expanding Autonomics, Robotic Process Automation and Digital Agents to reduce costs and improve the client experience through natural language processing, machine learning and cognitive intelligence.



Digital, IoT & Analytics

Expanding our digital solutions to bring rapid client impact
Accelerating analytical solutions to provide direct client impact.
Taking IoT from experiment to solutions.



As-a-Service Platforms

Expanding our BPO components (Process Management, RPA and Analytics), to provide a full As-a-Service model.

Providing RPA as a Service, separate from BPO



Global Team - 10,500

=  Human - 8,500 +  Robots - 2,000

Consulting

Highly qualified consultants focused on accelerating client transformation through innovation to help NTT DATA Services and our clients take advantage of these evolving technologies

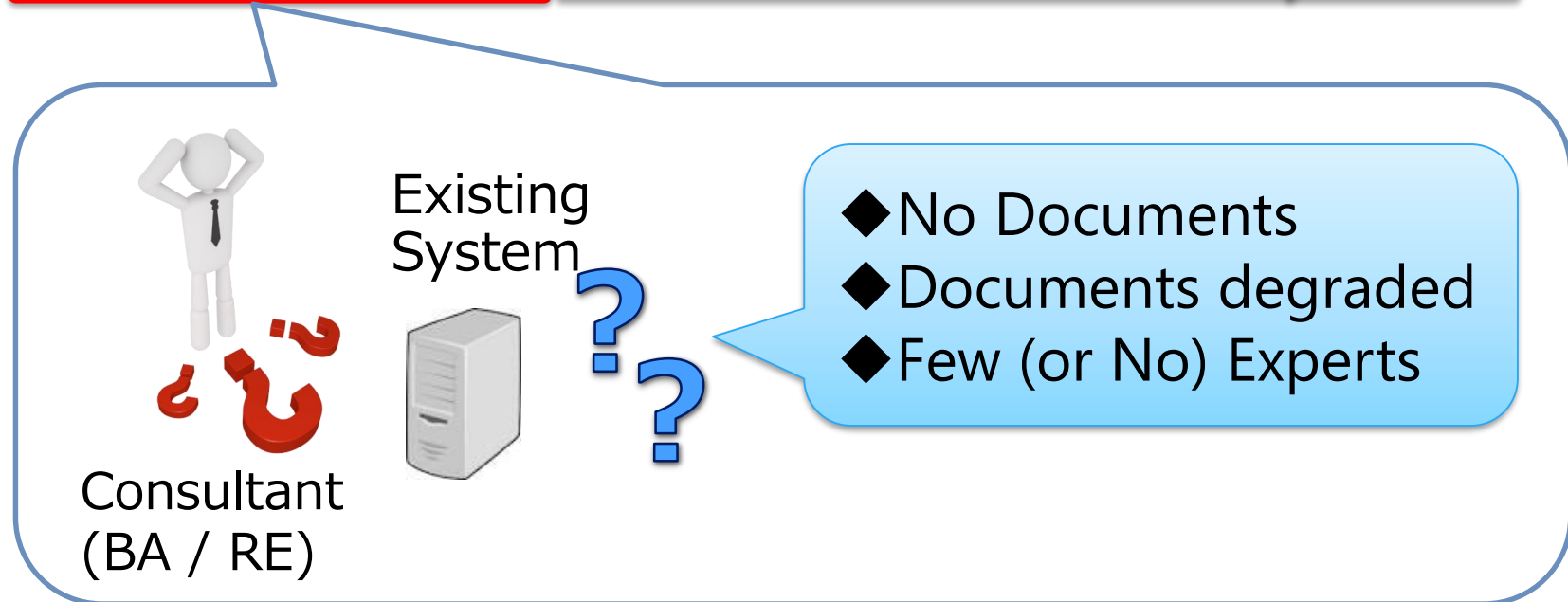
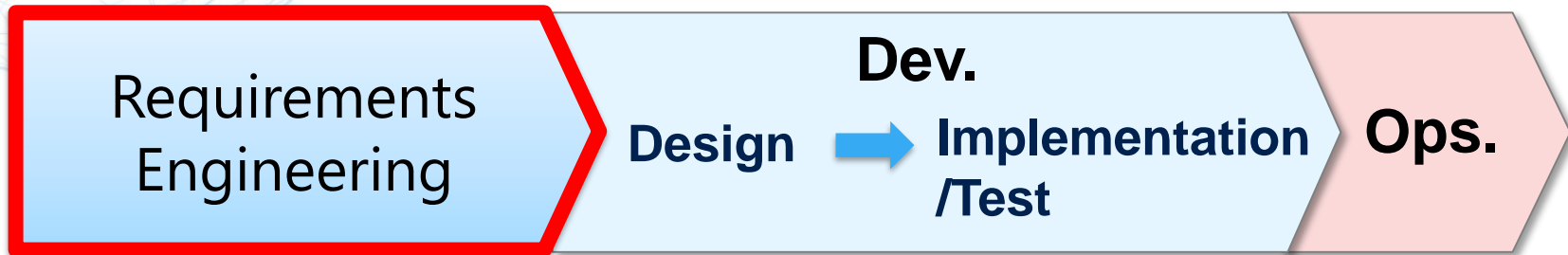


Consultants play a key role in requirements engineering.

- One decisive factor influencing success of requirements engineering is to identify and understand **the right stakeholders** correctly and completely.
- Requirements engineers need to know which **organizational entity, as a stakeholder**, has an influence on the requirements of the system.

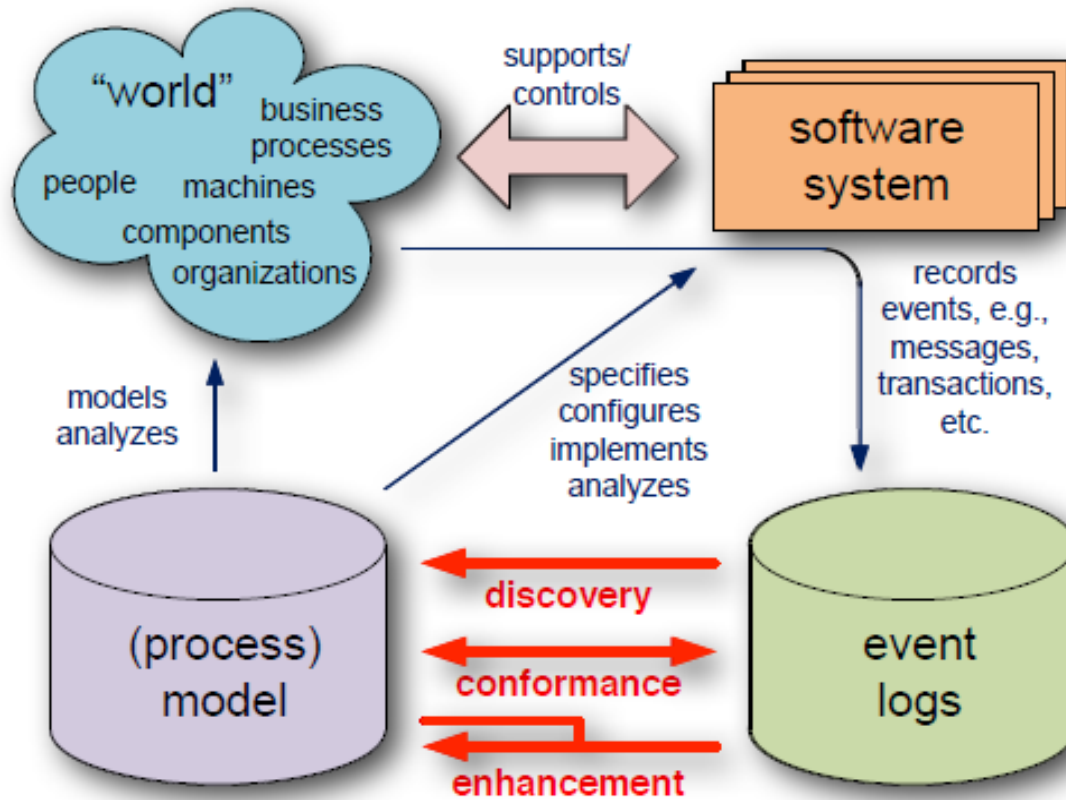
Lack of Business Process Document

- Business process models are very helpful to identify organizational entities related to the system.
- However, business processes are often undocumented.



Process Mining

Process mining is a research field for identifying business processes from the event logs generated by a system.



Business Processes by Process Mining

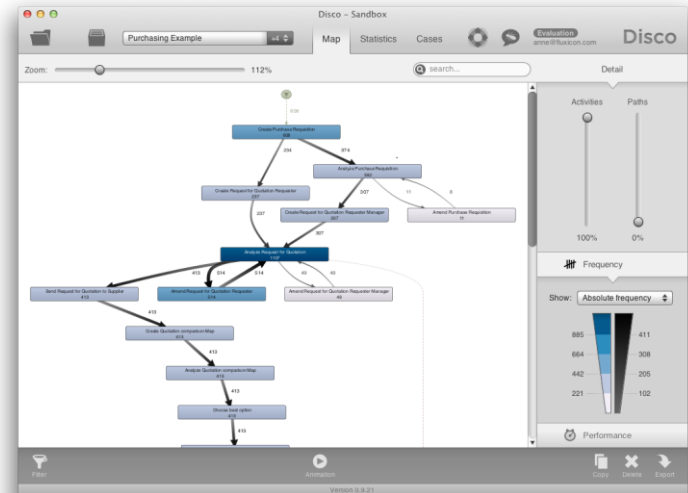
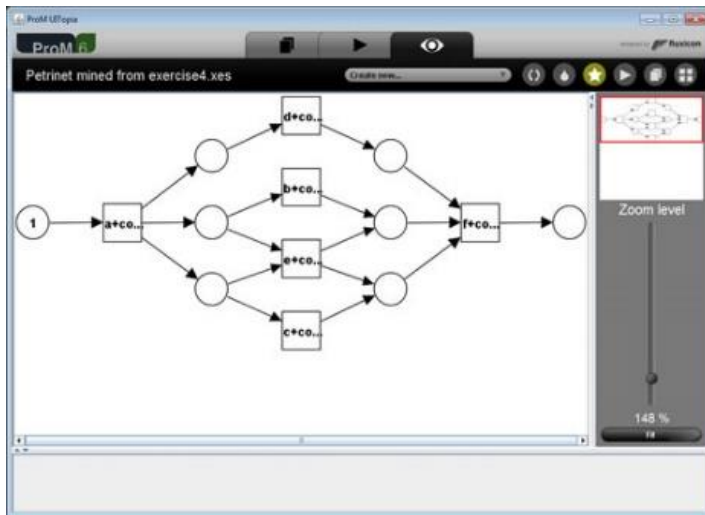
Existing process mining approaches focus on sequential flows. The models lack information on organizational entities.



<http://www.promtools.org/doku.php>



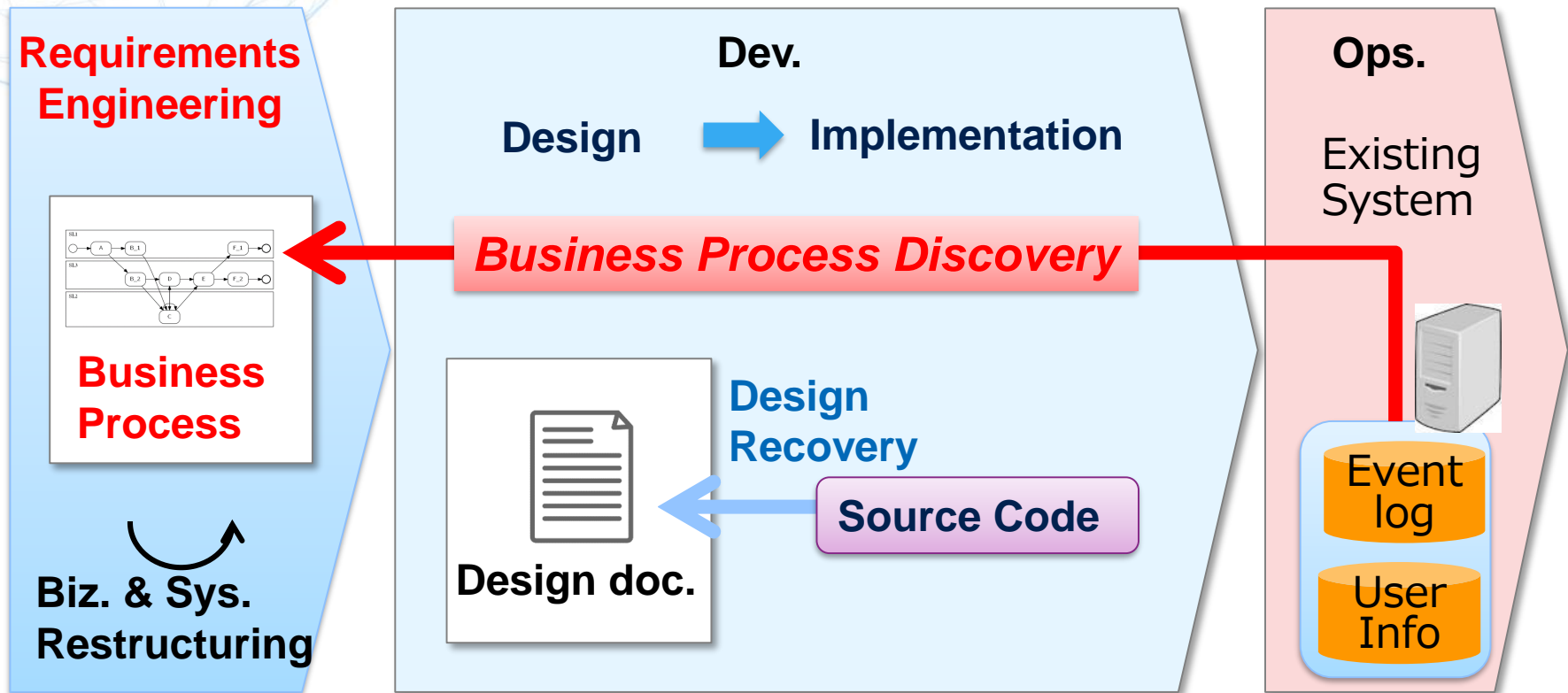
<http://fluxicon.com/>



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Approach: Discovering business processes that involve organizational entities from an event logs and user information



Basic Concept of Discovery Method(1/2)

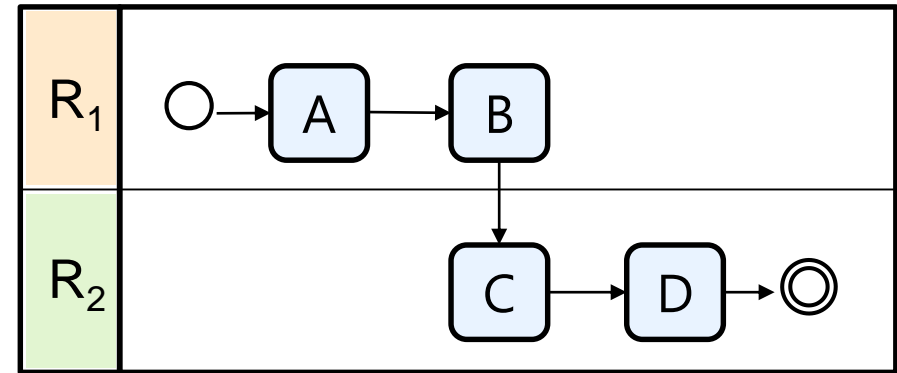
-Generating Business Processes that Involve Organizational Entities-

Event log

Case	Activity	Time stamp	User ID
W_1	A	TS_1	001
W_1	B	TS_2	001
W_1	C	TS_3	002
W_1	D	TS_4	002



Business Process



User Info

User ID	Organization
001	R_1
002	R_2
003	R_3



Activity A and B are executed in Swimlane R_1 . Activity C and D are executed in Swimlane R_2 .

Basic Concept of Discovery Method(2/2)

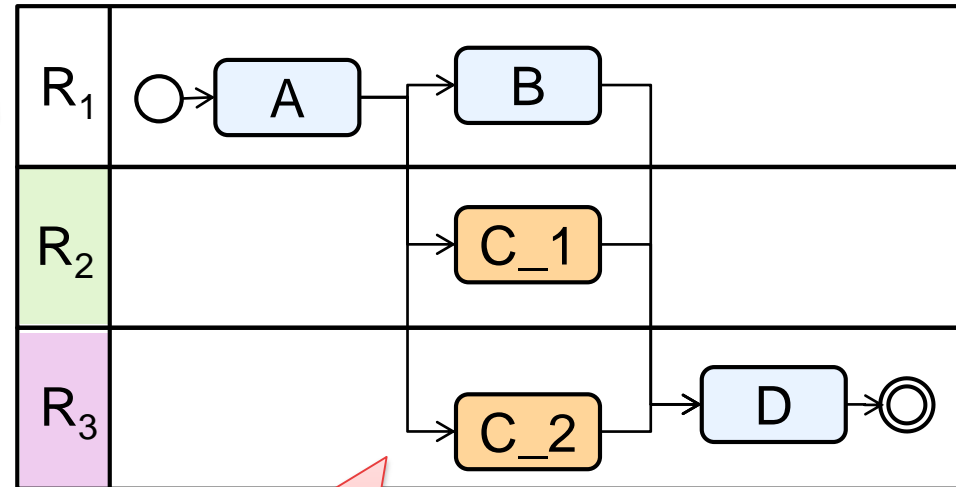
-Generating Business Processes that Involve Organizational Entities-

Event log

Case	Activity	Time stamp	User ID
W ₁	A	TS ₁	001
W ₁	B	TS ₂	001
W ₁	C	TS ₃	002
W ₁	D	TS ₄	002
W ₂	A	TS ₁	001
W ₂	C	TS ₂	003
W ₂	D	TS ₃	002

User Info

User ID	Organization
001	R ₁
002	R ₂
003	R ₃



Activity C is divided into two activities (C₁ and C₂)

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Software Implementation (BP retriever)

Event log

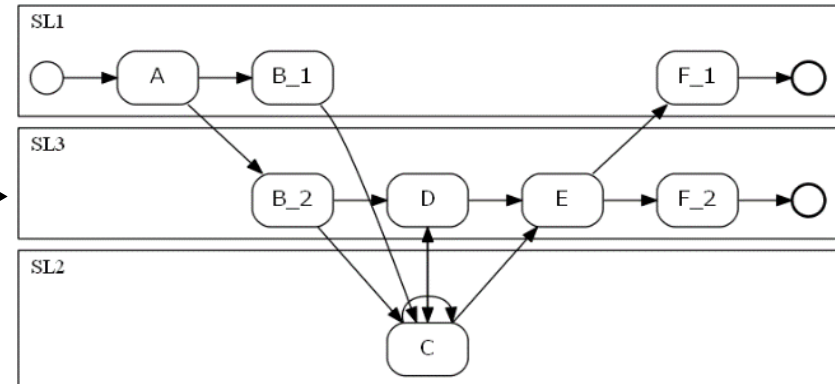
```
w1,A,2015/12/9 8:20,10001  
w1,B,2015/12/9 8:21,10003  
w1,C,2015/12/10 8:22,10005  
w1,C,2015/12/10 10:22,10005  
w1,D,2015/12/11 8:23,10002  
w1,E,2015/12/11 9:22,10003  
w1,F,2015/12/12 9:23,10004  
...  
w2,A,2015/12/9 8:20,10001  
w2,B,2015/12/9 8:22,10003  
w2,D,2015/12/9 8:23,10003  
w2,C,2015/12/11 12:21,10005  
w2,E,2015/12/12 9:22,10003  
w2,F,2015/12/12 10:22,10003  
...  
w3,A,2015/12/9 8:20,10001  
w3,B,2015/12/9 16:00,10001  
w3,C,2015/12/10 8:20,10005  
w3,D,2015/12/10 8:22,10003  
w3,E,2015/12/11 8:21,10003  
w3,F,2015/12/12 9:22,10003
```

User Info

```
"10001", "SL1"  
"10002", "SL2"  
"10003", "SL3"  
"10004", "SL1"  
"10005", "SL2"
```

"BP retriever" automates the discovery steps.

Business Process



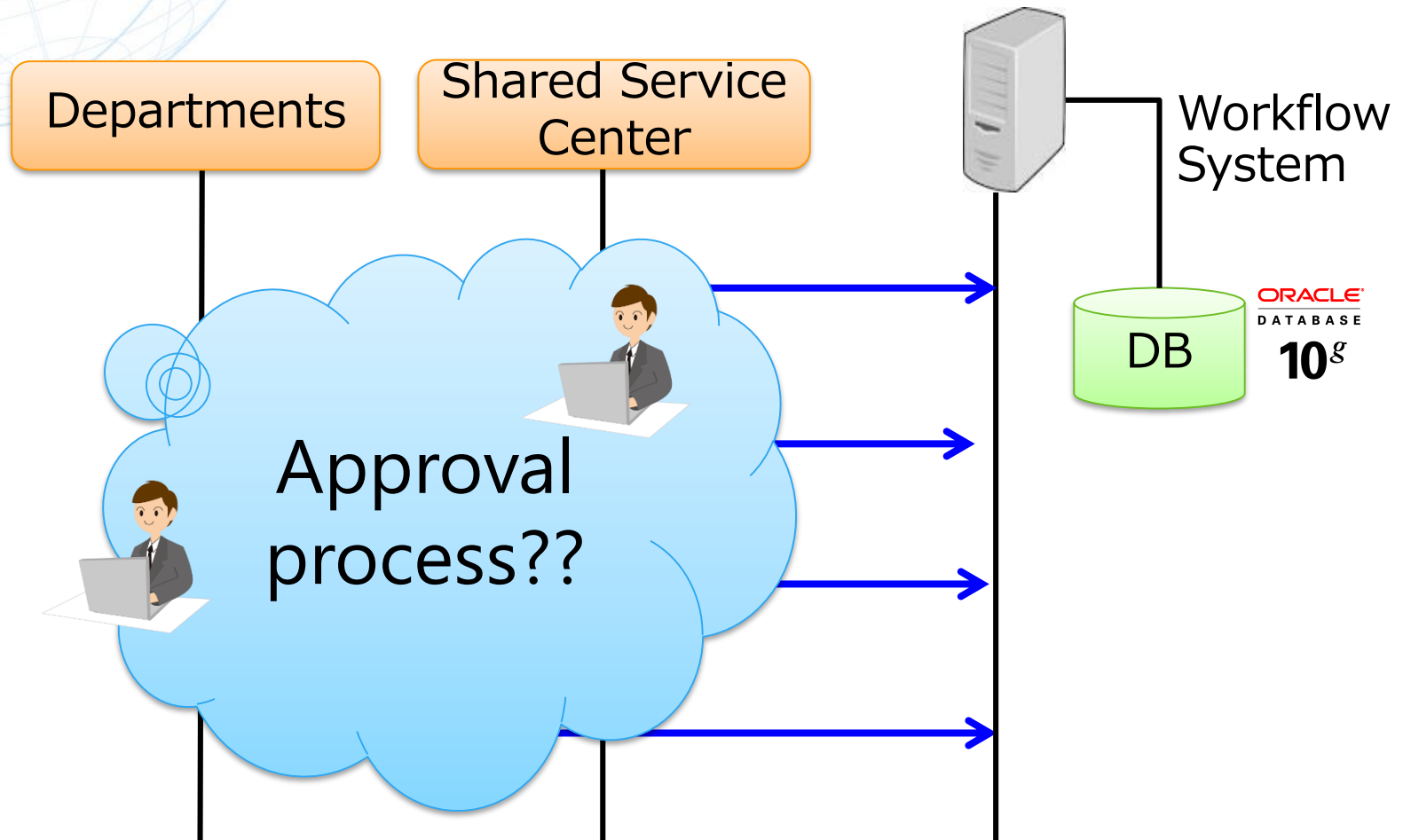
BP retriever

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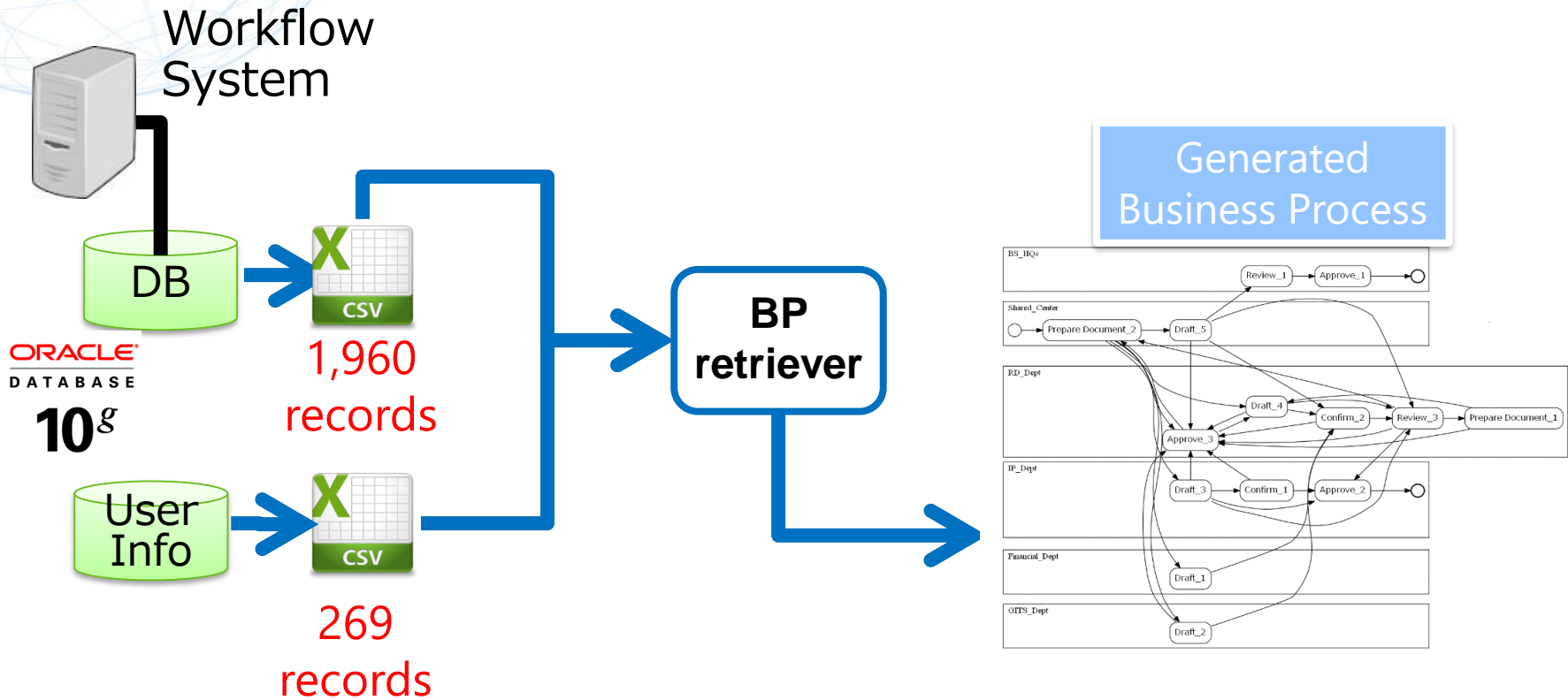
Target System in Case Study

- An industry workflow system for procuring office supplies and equipment.

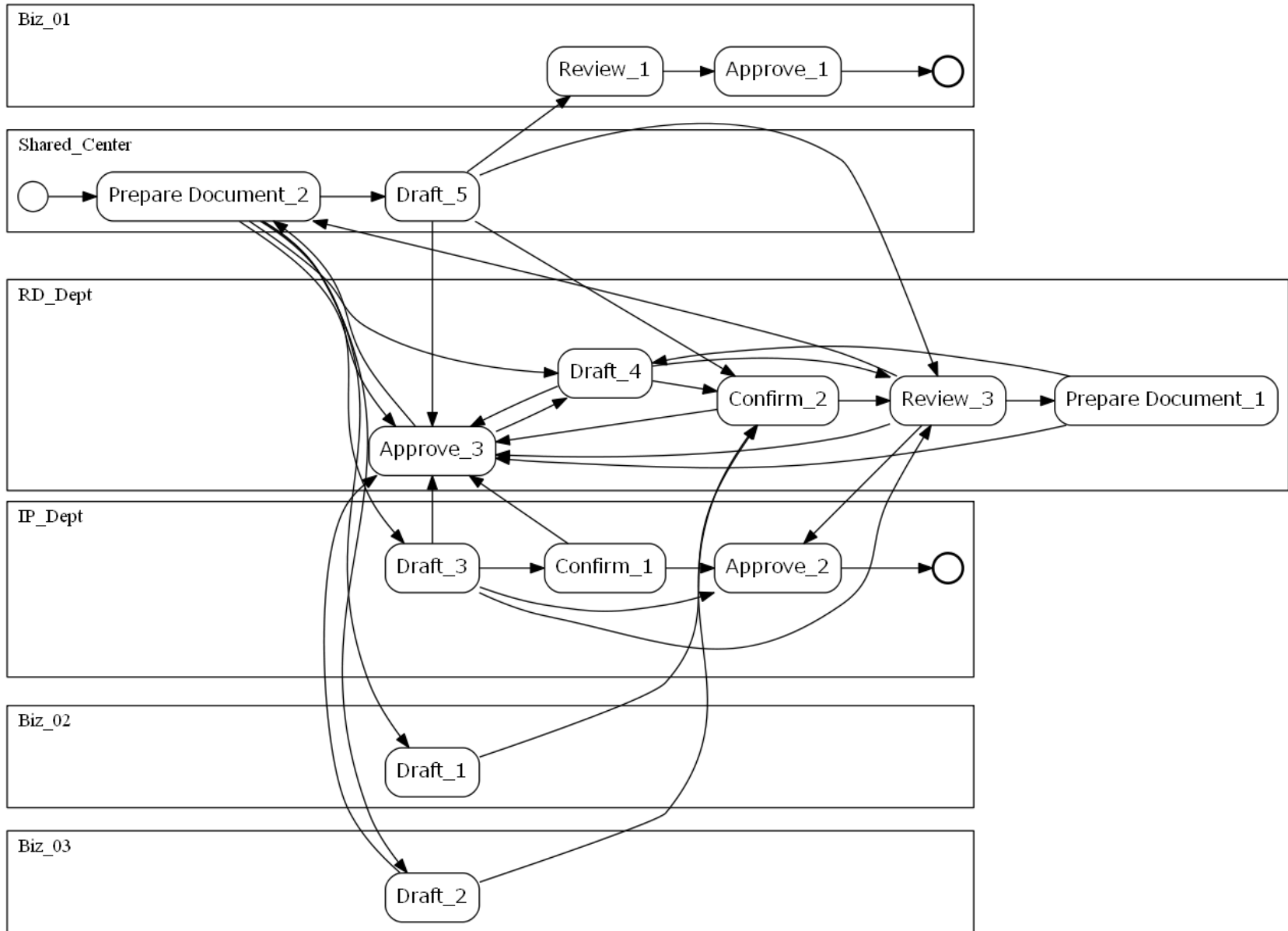


Business Process Discovery

We used our tool to discover this department's approval process based on **two years system's data**.



Generated Business Process



Stakeholder - Activity Matrix

All the activities are affected by more than one department.

Activity Department	Prepare Document	Draft	Confirm	Review	Approve
RD_Dept	X	X	X	X	X
Shared_Center	X	X			
IP_Dept		X	X		X
Biz_01				X	X
Biz_02		X			
Biz_03		X			

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Summary and Future Issue

- Summary

- We introduced our industrial case study for identifying and understanding stakeholders.
- Our tool generated the business process model that involves organizational entities (i.e., swim-lanes) by analyzing the database of the system.
- The model can help requirements engineers to capture correct and complete stakeholders.

- Future Issue

- We plan to verify the generated process models from the case study.
- We will evaluate whether the result of eliciting requirements from stakeholders identified are effective for the project success.