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**Faculty of Computer Science
Workflow Systems and Technology Group**

Generating Data from Highly Flexible and Individual Process Settings through a Game-based Experimentation Service

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Motivation

Research Questions

Flexible & Individual Process Settings

Game Mechanics

Generated Data

Evaluation

Conclusion & Future Work



Basic Problem

- Flexible and individual process settings can be found in many domains
- Common properties can be found in those domains
- Problem: Data access is usually restricted - e.g. data privacy in health sector



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- the general concept stays the same, but the setting is different
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Goal

- generate process change and execution logs
- generate related data for evaluation
- provide a setting for evaluation



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RQ1: „Which data elements are common to a flexible and individual process setting?“

- Find the necessary data building blocks
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RQ2: „How can these building blocks be represented in a game?“

- Map these building blocks to a game-based experimentation environment

RQ3: „Is a game-based design suitable for generating the data common to a flexible and individual process setting?“

- Evaluation: compare the data to data generated in a real world setting



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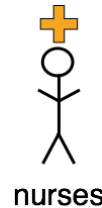
Conclusion & Future Work



Nursing Home

Building Blocks

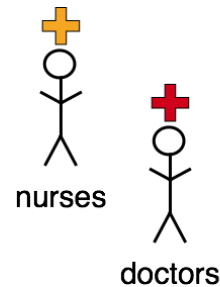
Organizational Units



Nursing Home

Building Blocks

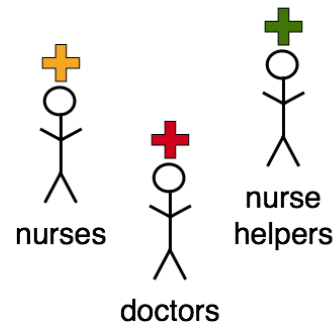
Organizational Units



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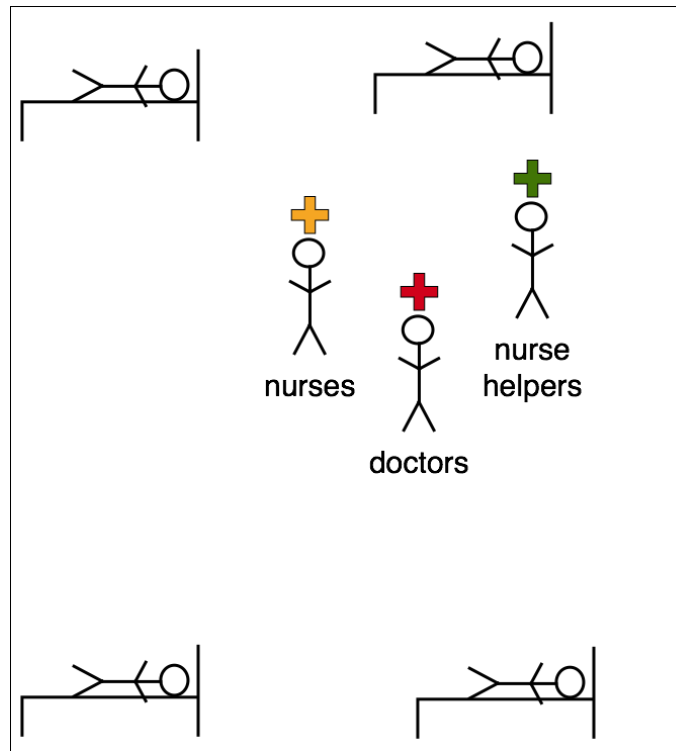


Nursing Home

Building Blocks

Organizational Units

Subjects



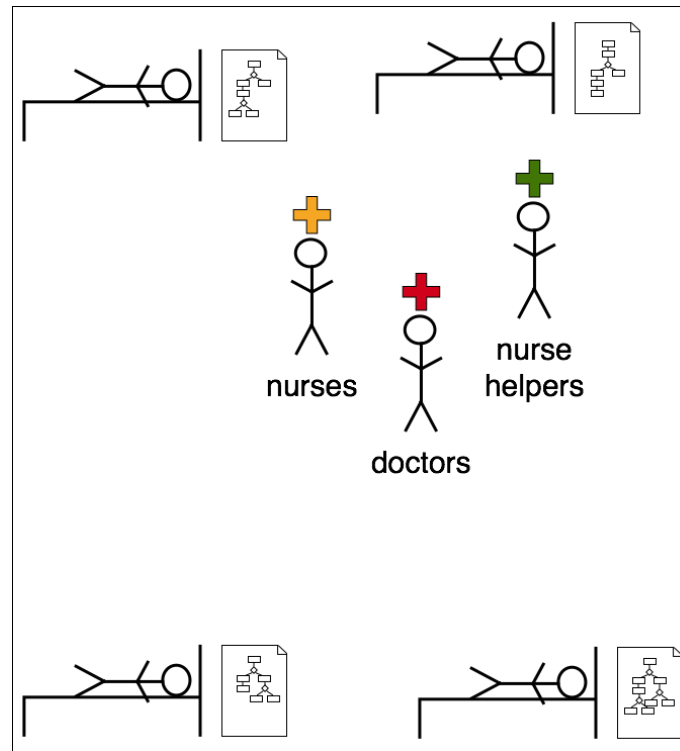
Nursing Home

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Process Instances



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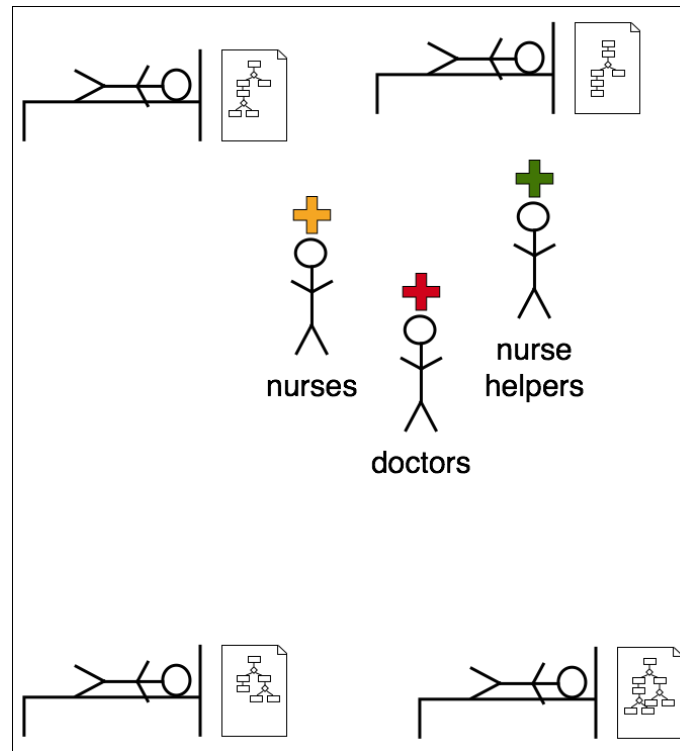
Building Blocks

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Nursing Home

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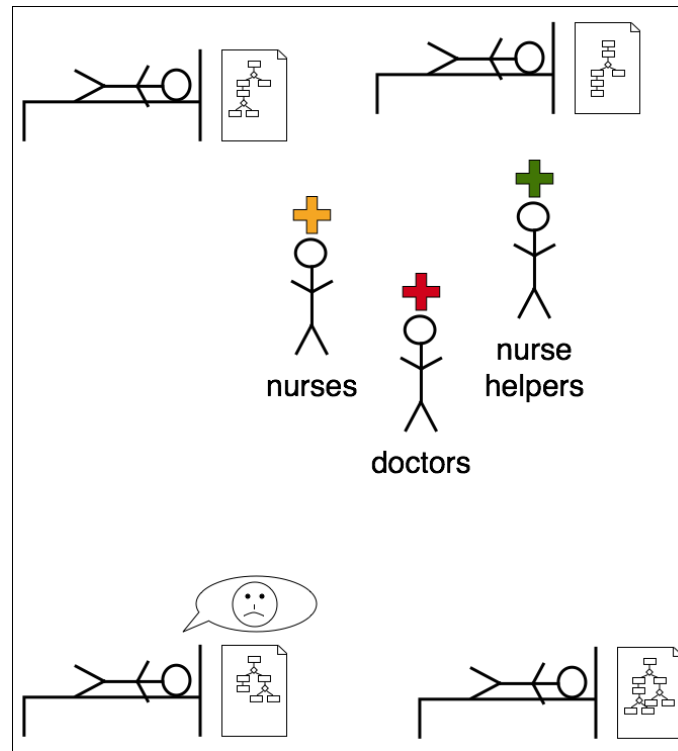
Organizational Units

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Environment

Triggers



Nursing Home

Building Blocks

Organizational Units

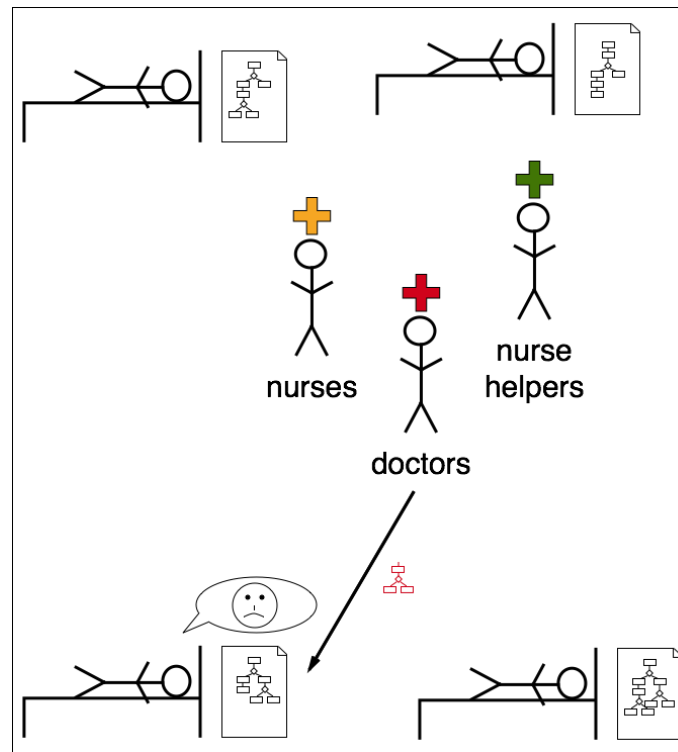
Subjects

Process Instances

Environment

Triggers

Process Fragments



Phases

Planning



Nursing Home

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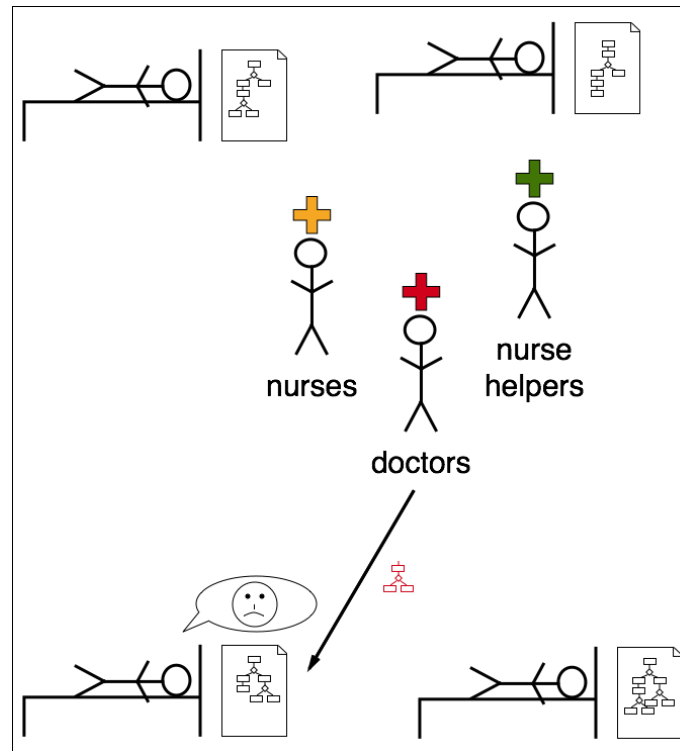
Environment

Triggers

Process Fragments

- Problem List

- Bonus List



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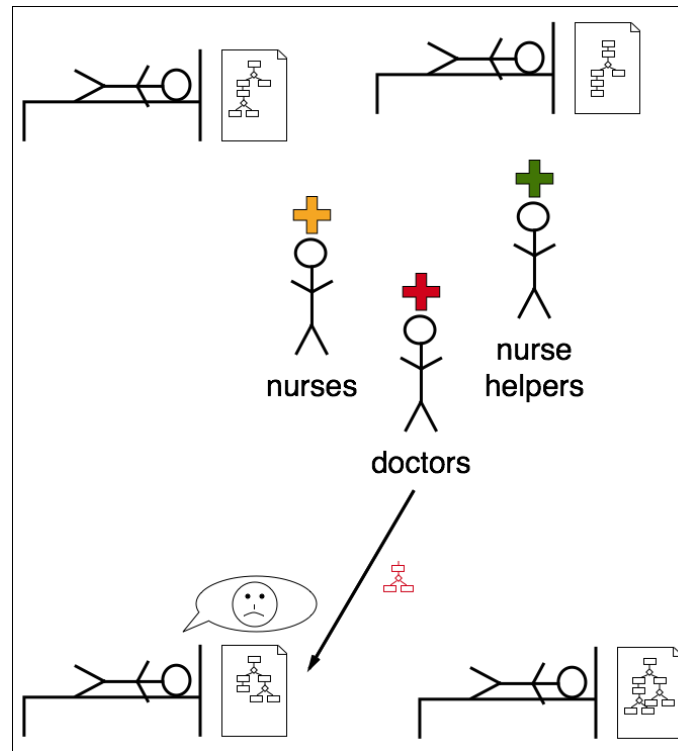
Process Fragments

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Positive Goals

Negative Goals



Phases

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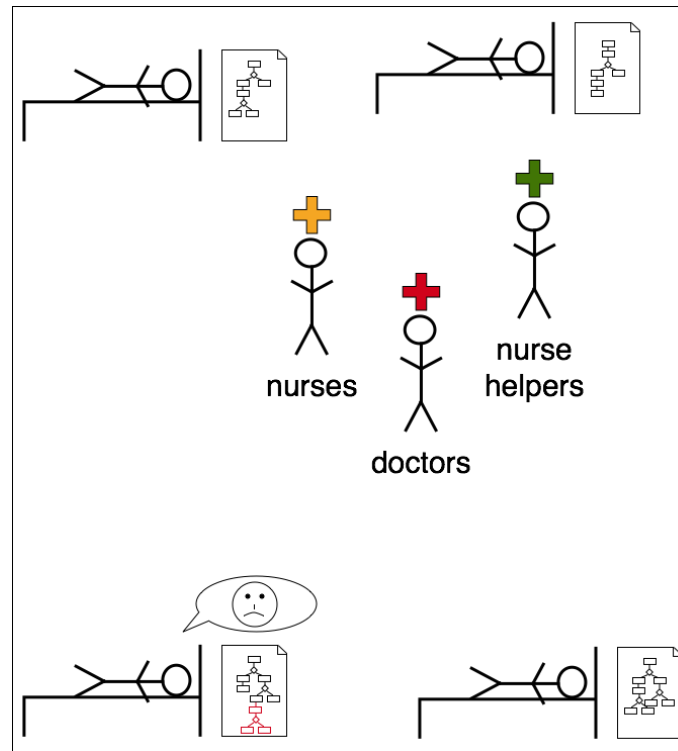
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Phases

Planning

Process Adaption



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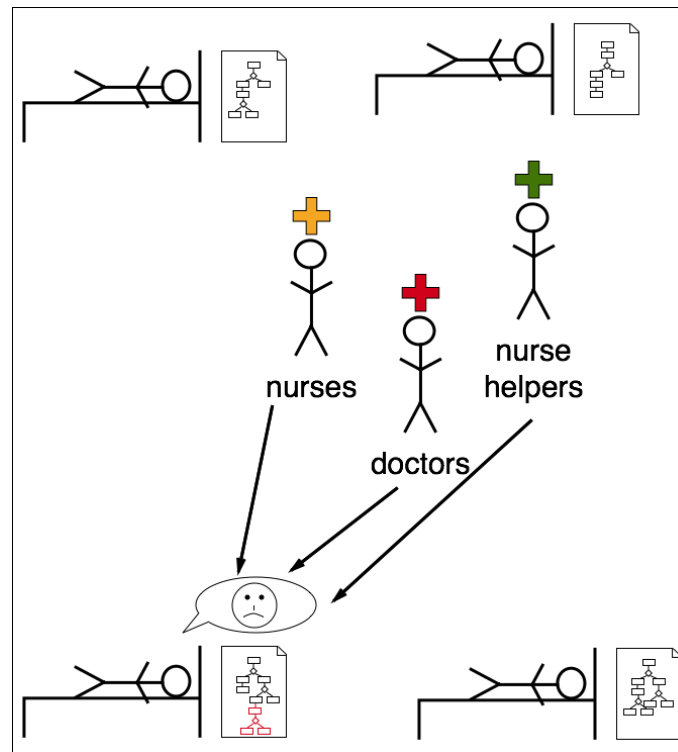
Process Fragments

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Phases

Planning

Process Adaption

Execution



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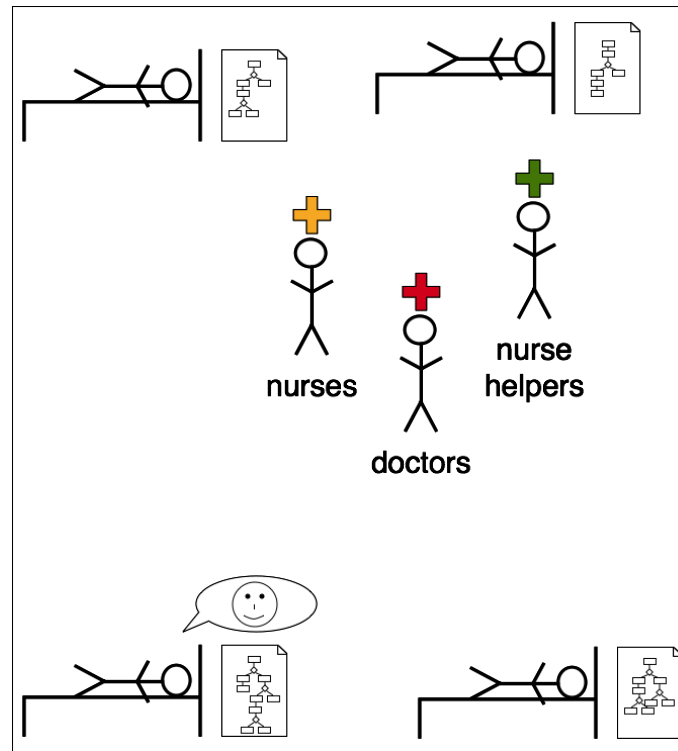
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Phases

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Nursing Home

Organizational Units	nurses, doctors, nurse helpers
Subjects	patients
Process Instances	therapy plans
Environment	nursing home
Triggers	symptoms
Process Fragments	therapies
Problem List	allergies, ...
Bonus List	it has worked before, ...
Positive Goals	patient feels well again, ...
Negative Goals	patient dies, ...



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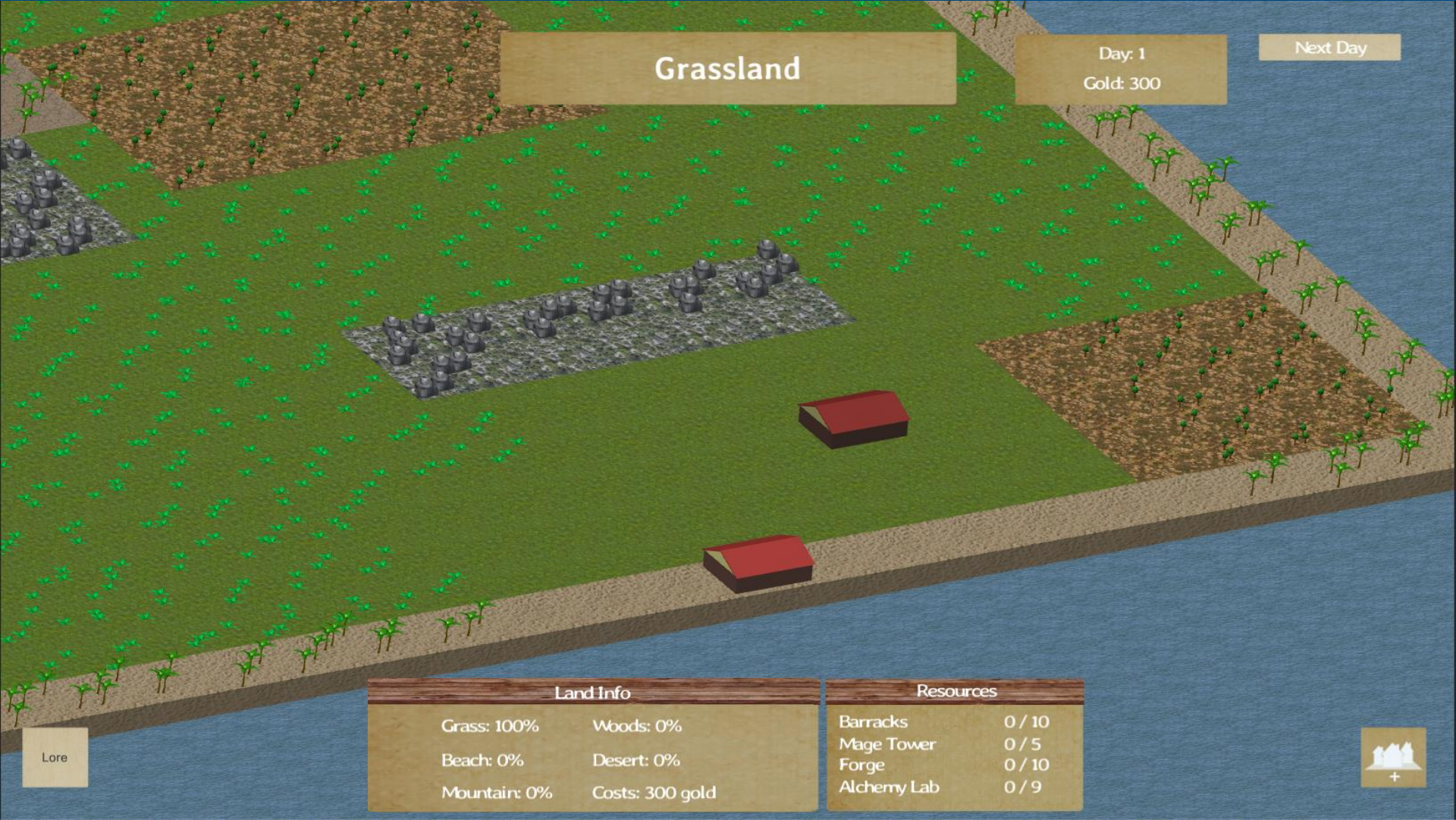


Game Mechanics: Gameplay



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Game Mechanics: Gameplay



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Each Round

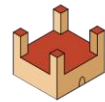
1. Evaluate last round's results
2. Player sees villages where an attack will come the next round
3. Choose defense (warriors etc.)
4. Adapt defense plan of the villages



Game Setting

Building Blocks

Organizational Units



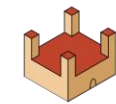
Barracks



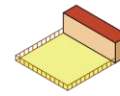
Game Setting

Building Blocks

Organizational Units



Barracks



Mage Tower



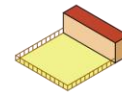
Game Setting

Building Blocks

Organizational Units



Barracks



Mage Tower



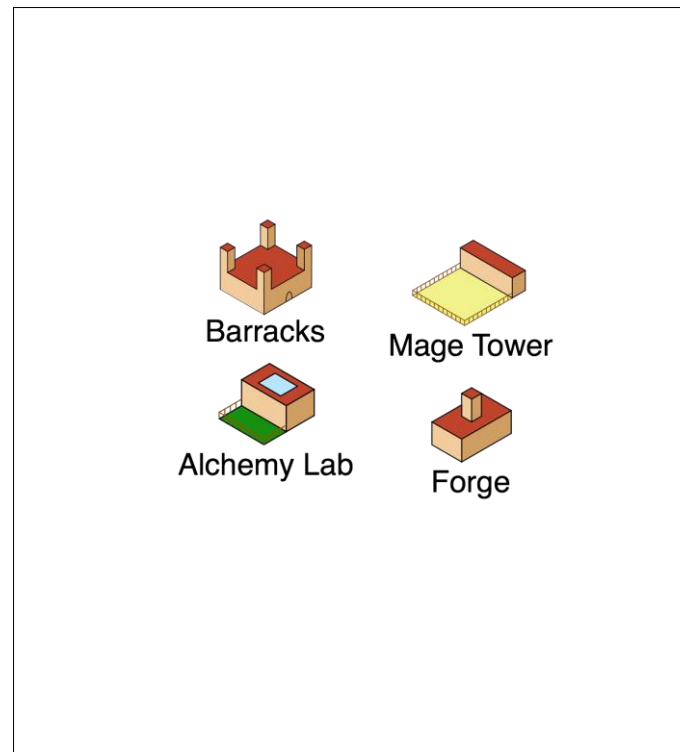
Alchemy Lab



Game Setting

Building Blocks

Organizational Units

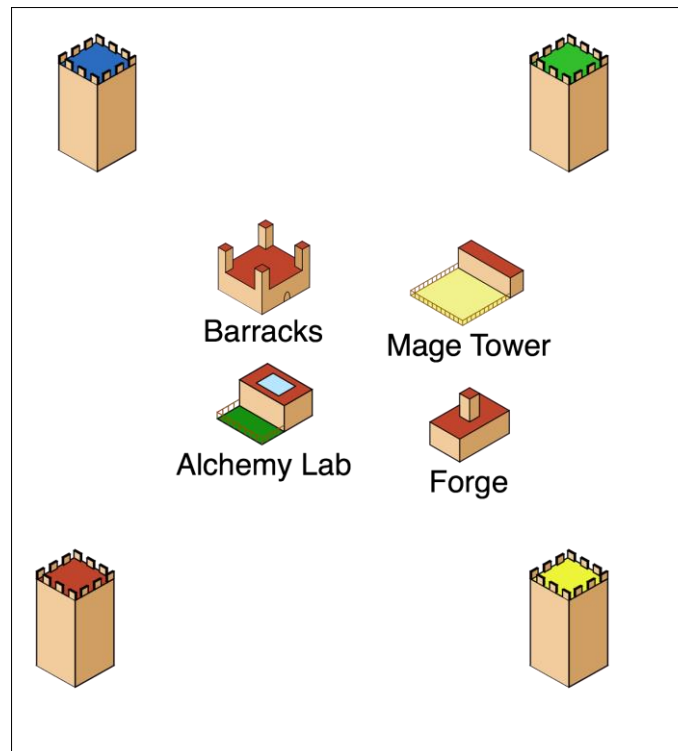


Game Setting

Building Blocks

Organizational Units

Subjects



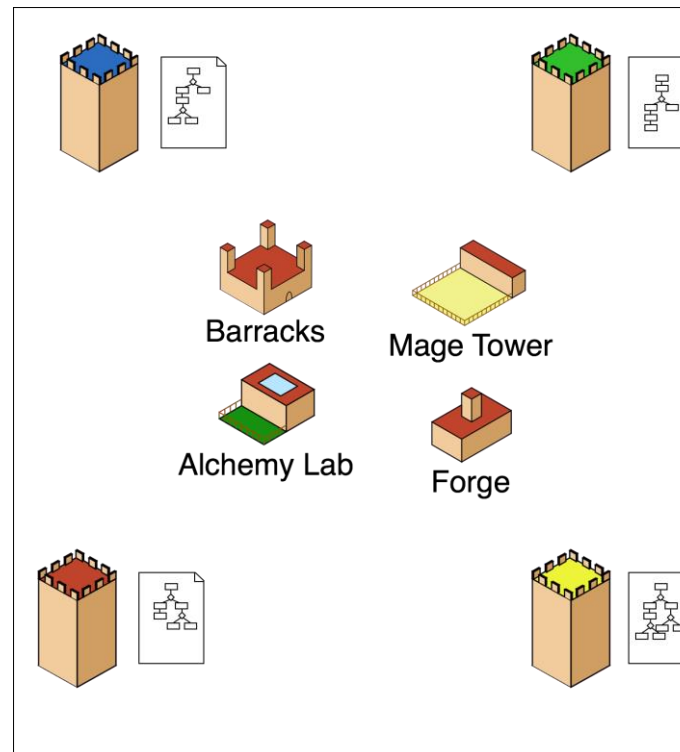
Game Setting

Building Blocks

Organizational Units

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Process Instances



Game Setting

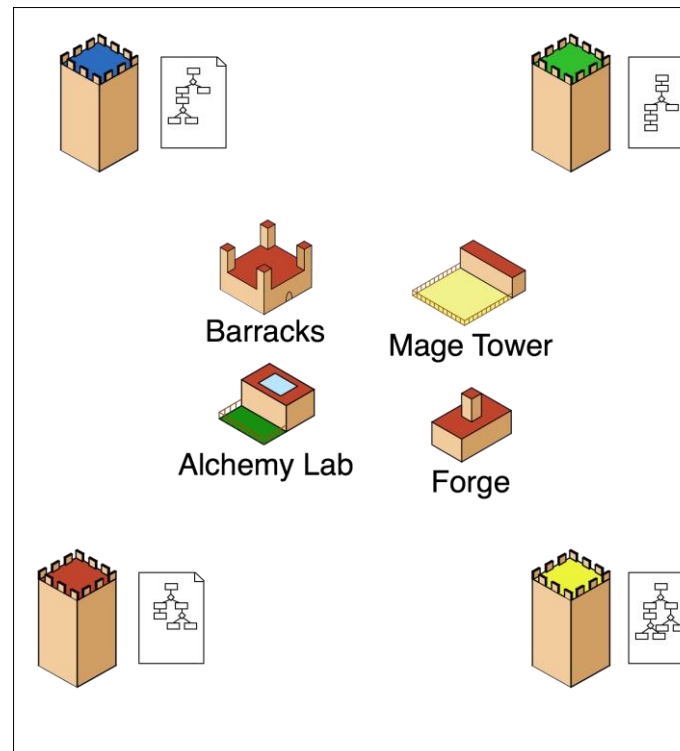
Building Blocks

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Game Setting

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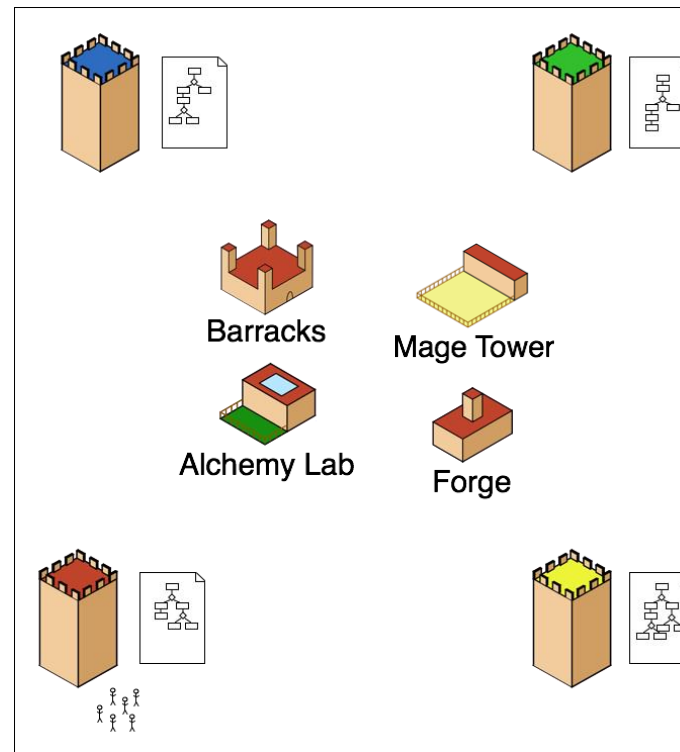
Organizational Units

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Triggers



Game Setting

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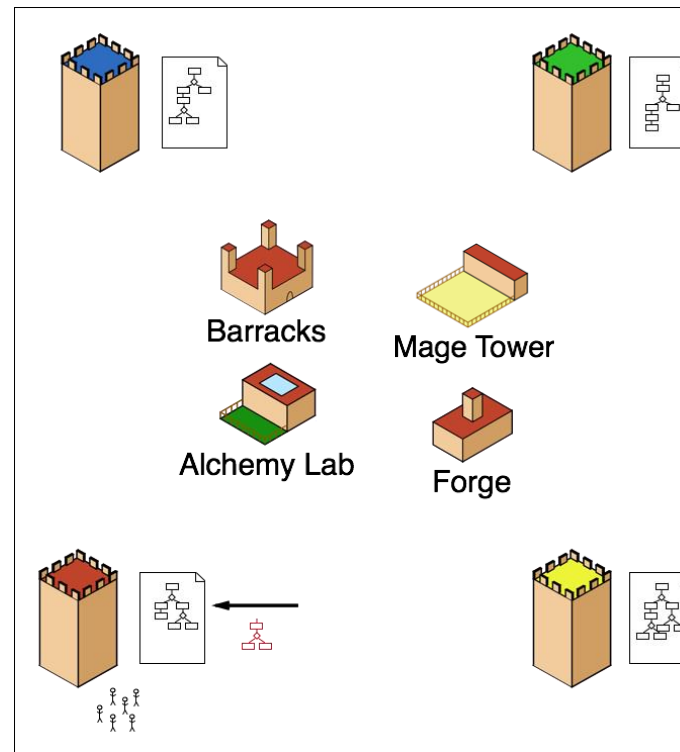
Subjects

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Process Fragments



Phases

Planning



Game Setting

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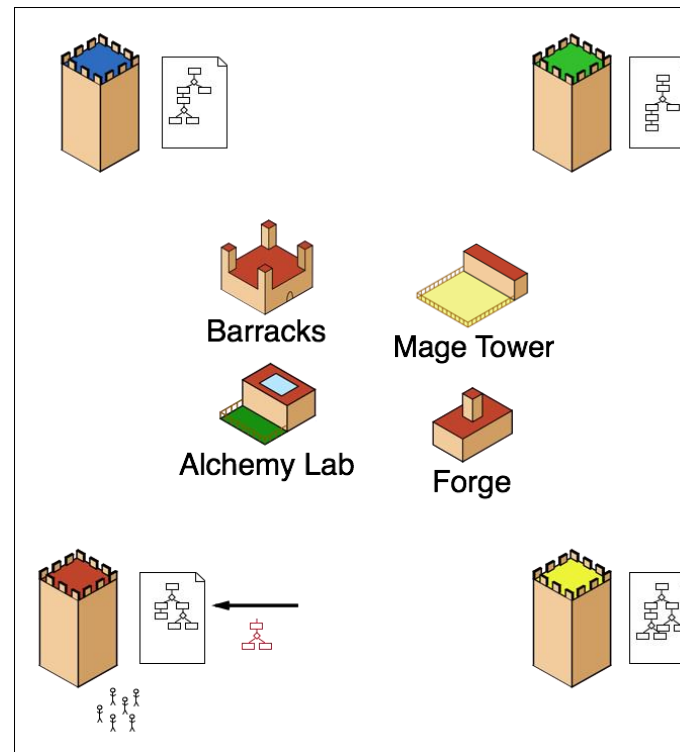
Environment

Triggers

Process Fragments

- Problem List

- Bonus List



Phases

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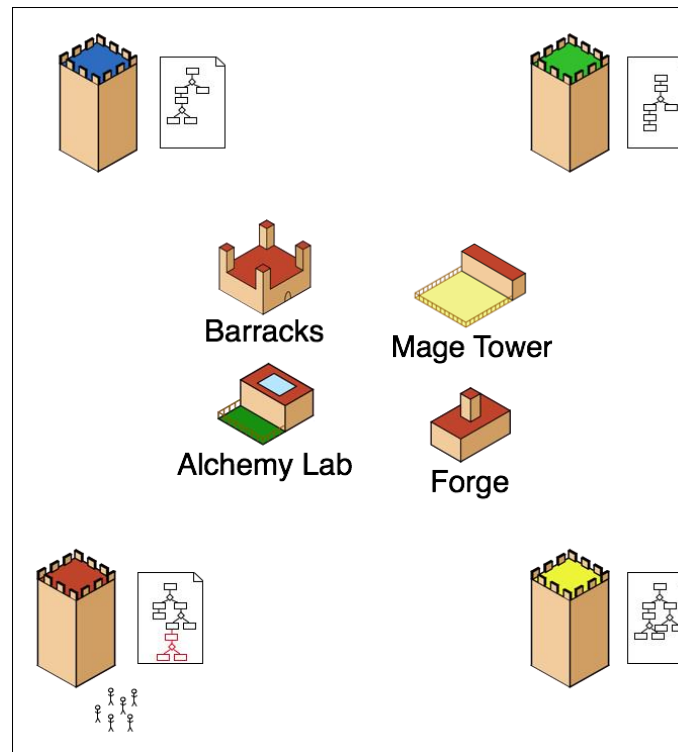
Process Fragments

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Positive Goals

Negative Goals



Phases

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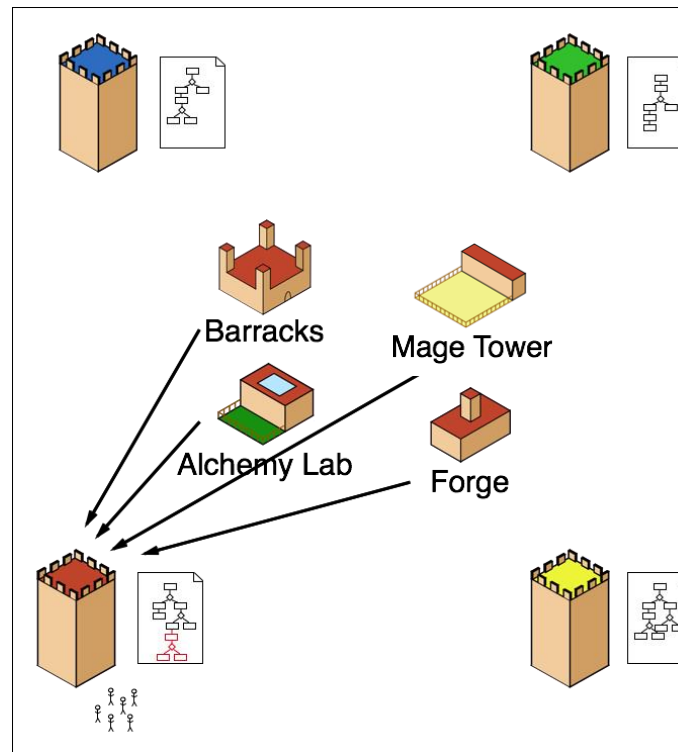
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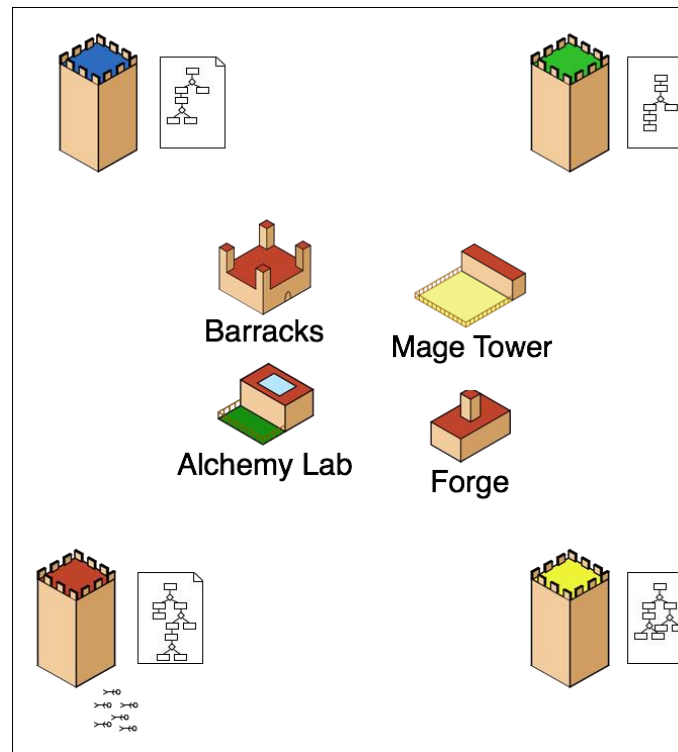
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Change Log

- Data about process change operations

Execution Log

- Data about process execution

General Log

- Environmental Data: workload of the organizational units
- Subject-Related Data
 - Previous attacks
 - Info about the village's field
- Evaluation Data
 - efficiency of an adaption - we know exactly if the user's approach did work or not

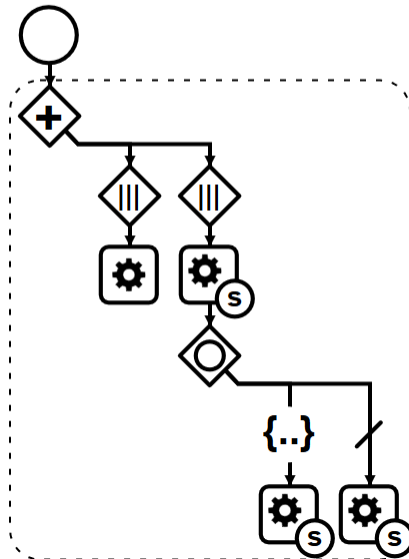




Graph

Description

Log

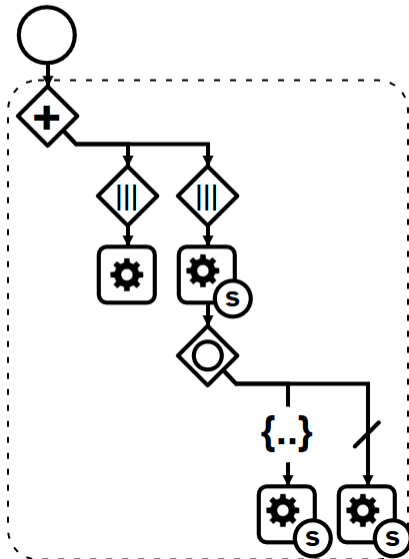




Graph

Description

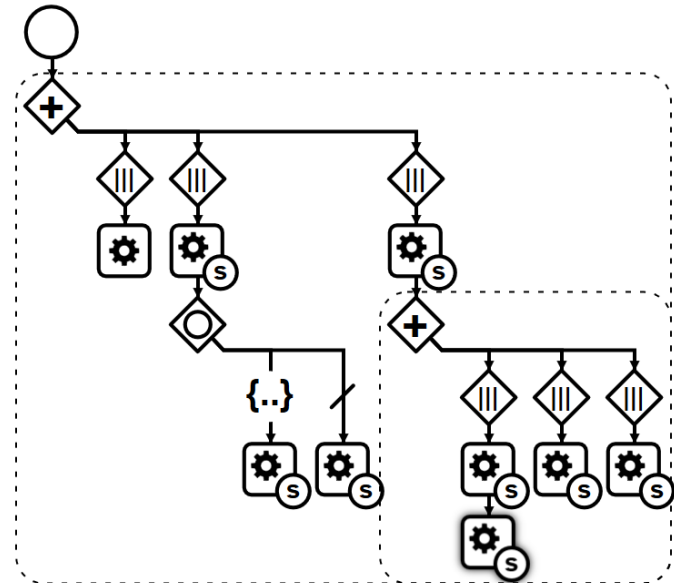
Log



Graph

Description

Log



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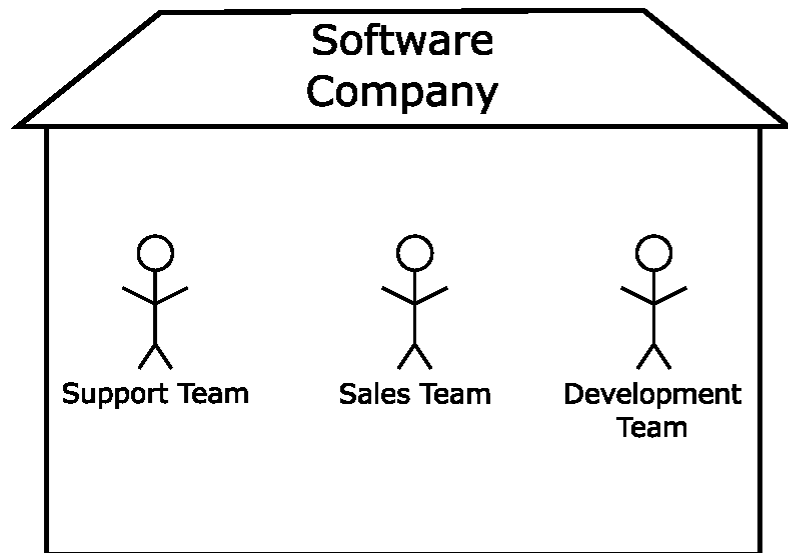
Generated Data

Evaluation

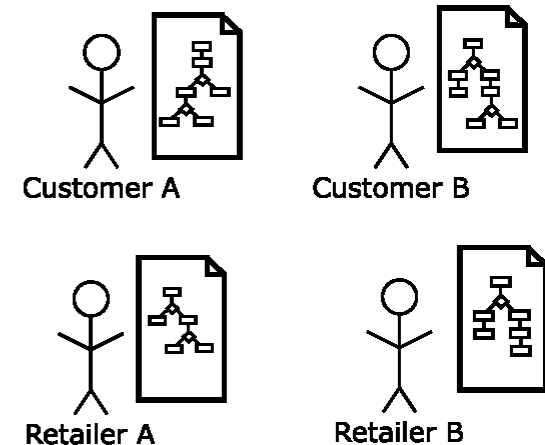
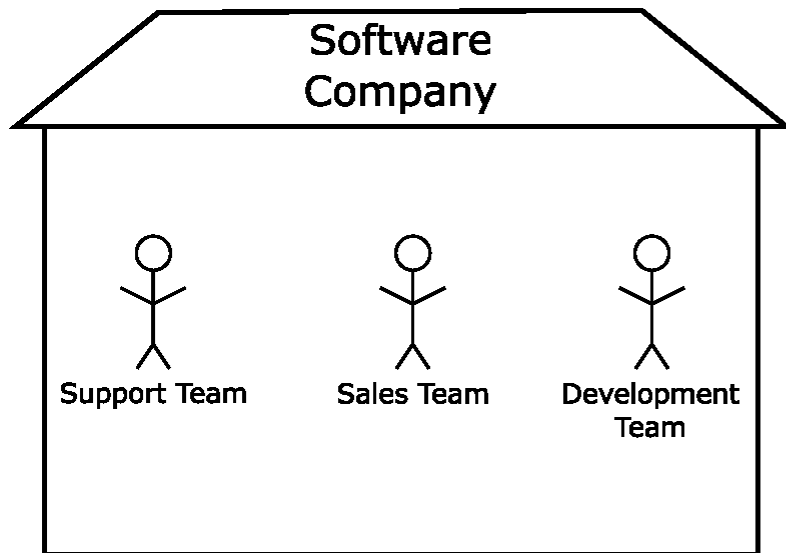
Conclusion & Future Work



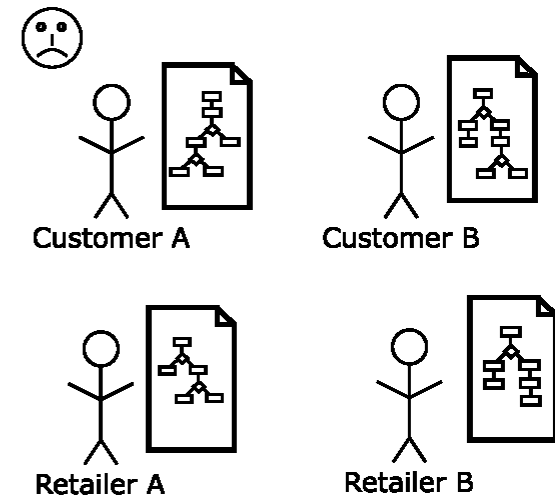
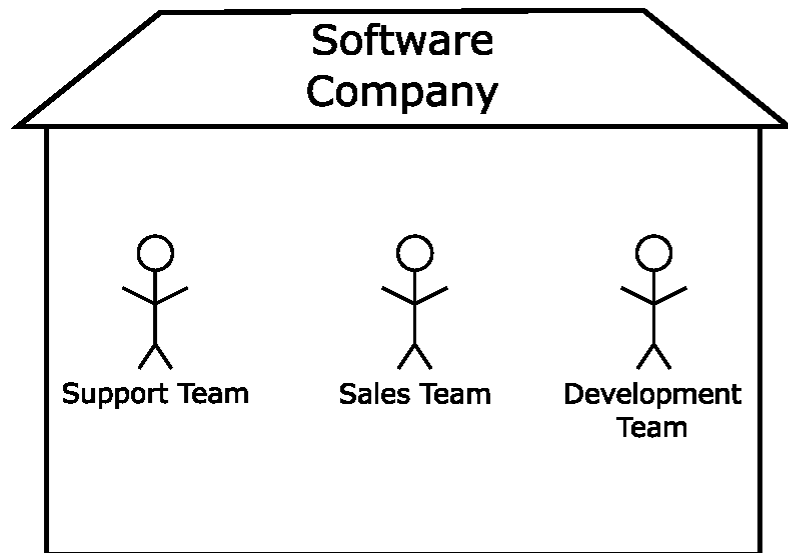
- Comparison between generated data and real world data
- Domain: Software Development & Support
- Compare data of a certain customer's problem with the data generated in the game



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Game: General Log

- basic information about village
- enemy description
- how the village's parameters evolved

Game: Change Log

- process change operations - what to do next?

Game: Execution Log

- execution of process steps



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- enemy description
- how the village's parameters evolved

Game: Change Log

- process change operations - what to do next?

Game: Execution Log

- execution of process steps

Support Case: General

- basic information about customer
- problem description
- how the problem evolved

Support Case: Change Log

- developer's calendar
- support team calendar

Support Case: Execution Log

- version log
- protocols of discussions



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Using logs to...

- compare approaches to react to a certain situation
 - effects on the subject
 - effects on the process instance
- find out when the same approach is used
- find out about side effects - change already existing "therapies"
- ...



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Conducting experiments

1. let the players learn how to play the game
2. let the players play the game without support
3. let the players play the game with support
4. compare the results
 1. resources used
 2. effectiveness
 3. goals reached
 4. ...





Thank you for your attention
Questions?

