

What is the impact of bad layout in the understandability of social goal models?

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Universidade NOVA de Lisboa

Research questions

1 Does adherence to **layout guidelines** influence the **understandability** of i^* models?

2 Does adherence to **layout guidelines** influence the **ability to review** i^* models?

Study method: quasi-experiment with a combination of measures

Success level

Precision

Recall

F-Measure

Effort

Duration

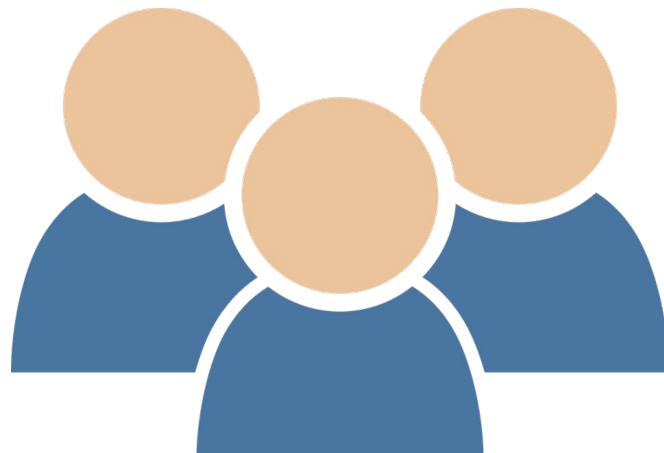
Perceived
complexity

Eye-tracking
data

Average fixation
duration

Fixation rates

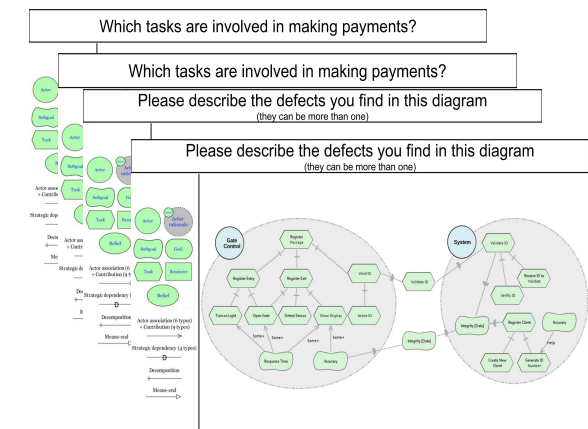
Experimental materials and participants



18 participants



1 eye-tracker



4 domains

Protocol of the experiment

Consent information letter

Information to participants

This experimental work is conducted with Informatics (NOVA LINCS). NOVA LINCS is a network in the area of Computer Science hosted at the Departamento de Informática, Universidade NOVA de Lisboa (DI-NOVA),

All information stated as part of this experiment

Prof. Miguel Goulão is responsible for mgoul@fct.unl.pt; +351 21 294 85 36 (ext. 2121)

We would like to emphasize that:

- your participation is entirely voluntary
- you are free to refuse to answer any question



Demographic Data

*Obrigatório

Gender *

- ☐ Male
☐ Female

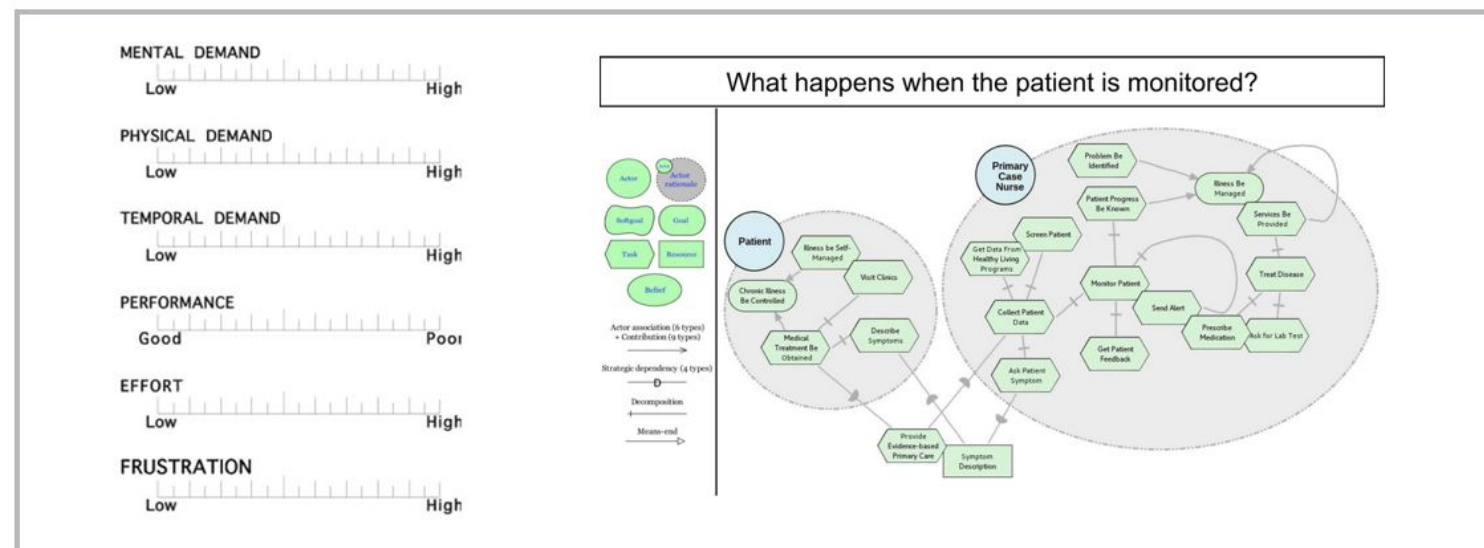
Age *

A sua resposta

Nationality *

A sua resposta

Field of Studies *



Read the consent information letter

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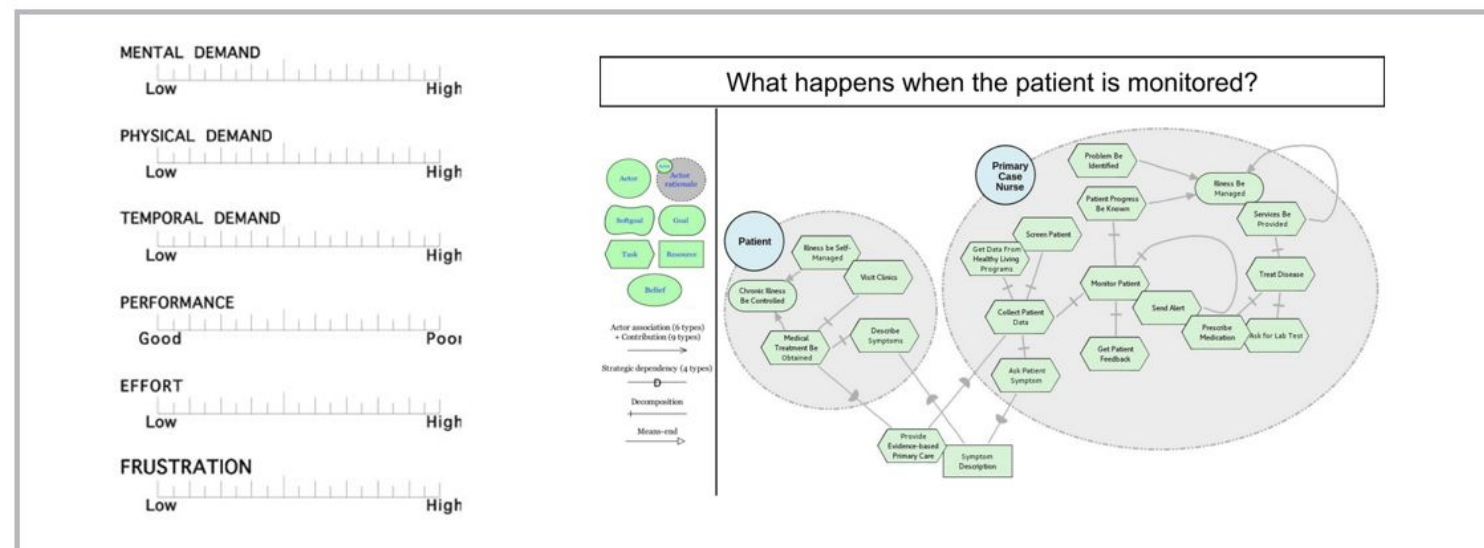
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Watch a video tutorial about i^*

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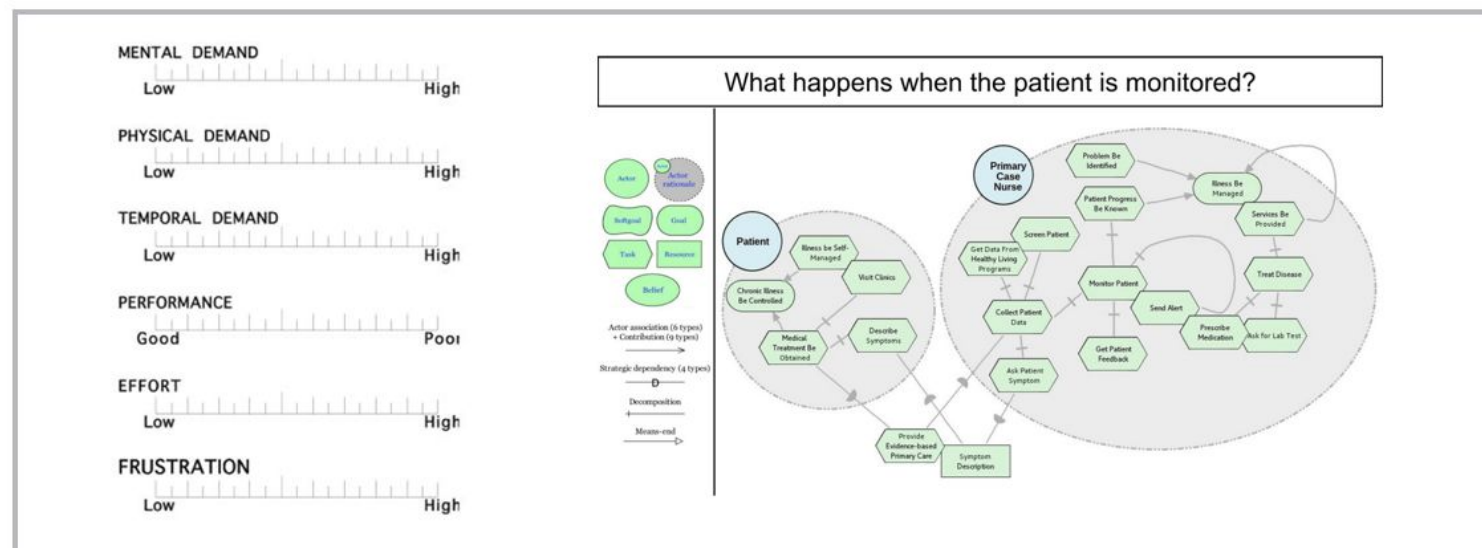
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Calibrate the eye-tracker

Consent information letter

Information to participants

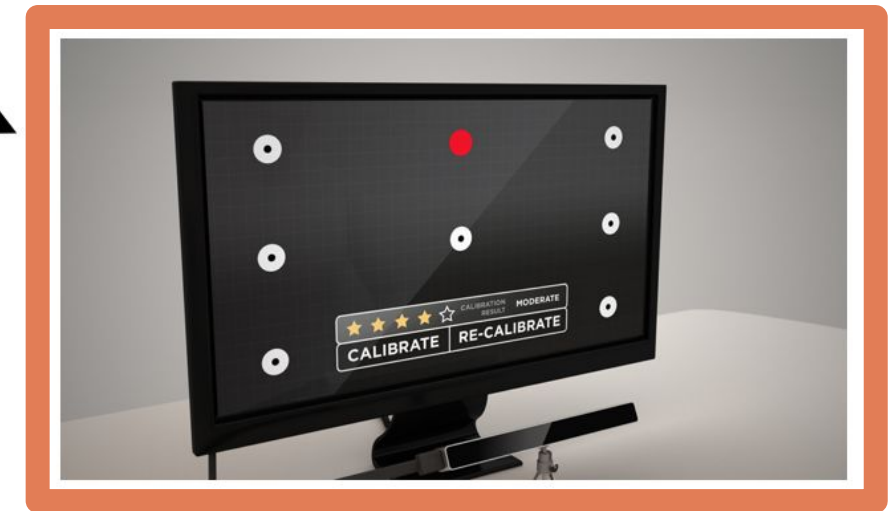
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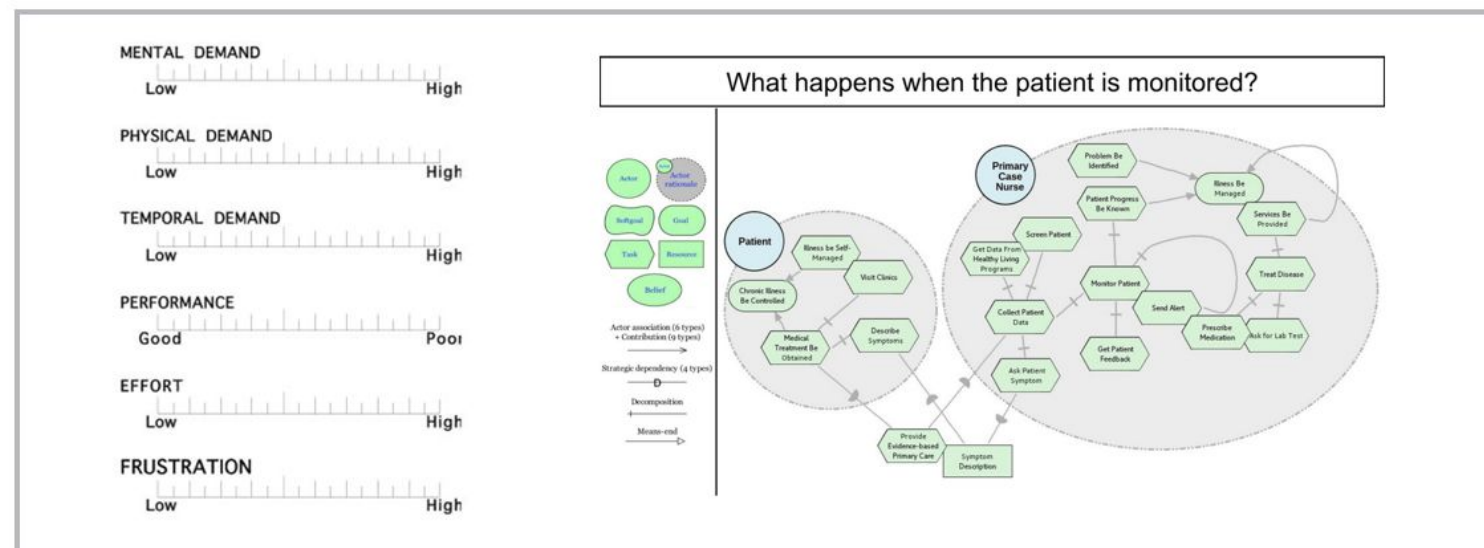
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Answer a question about a model

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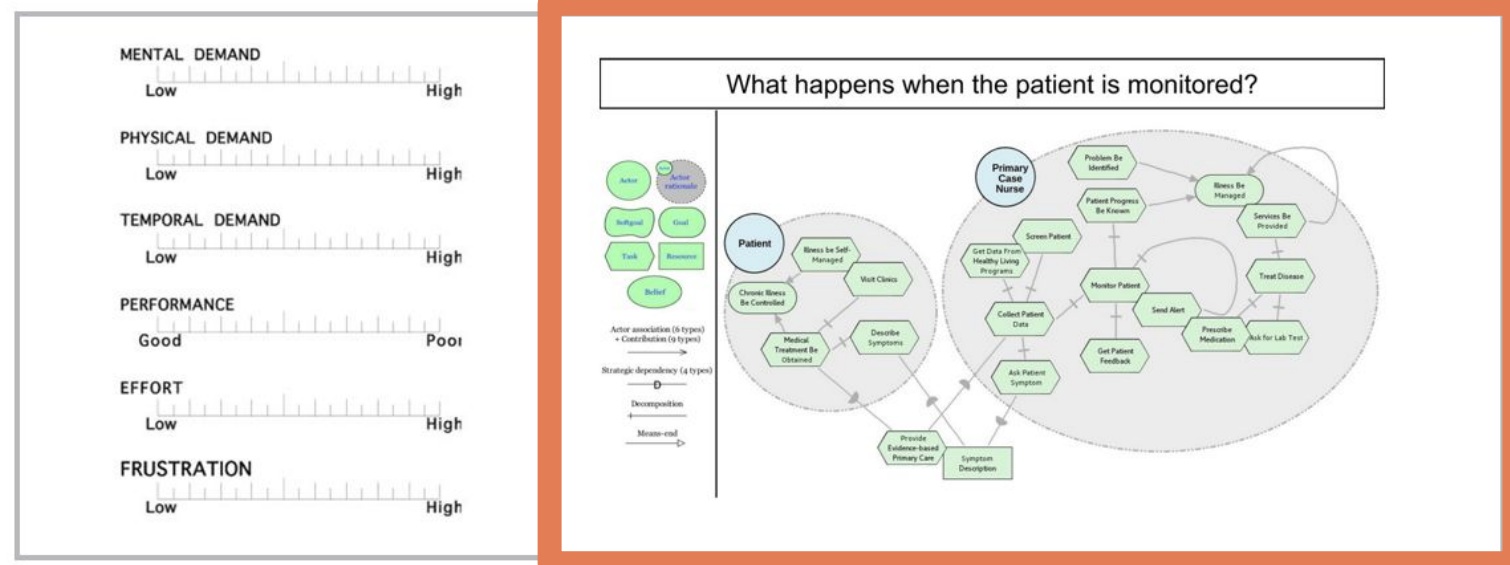
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A sua resposta

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Answer a NASA TLX questionnaire

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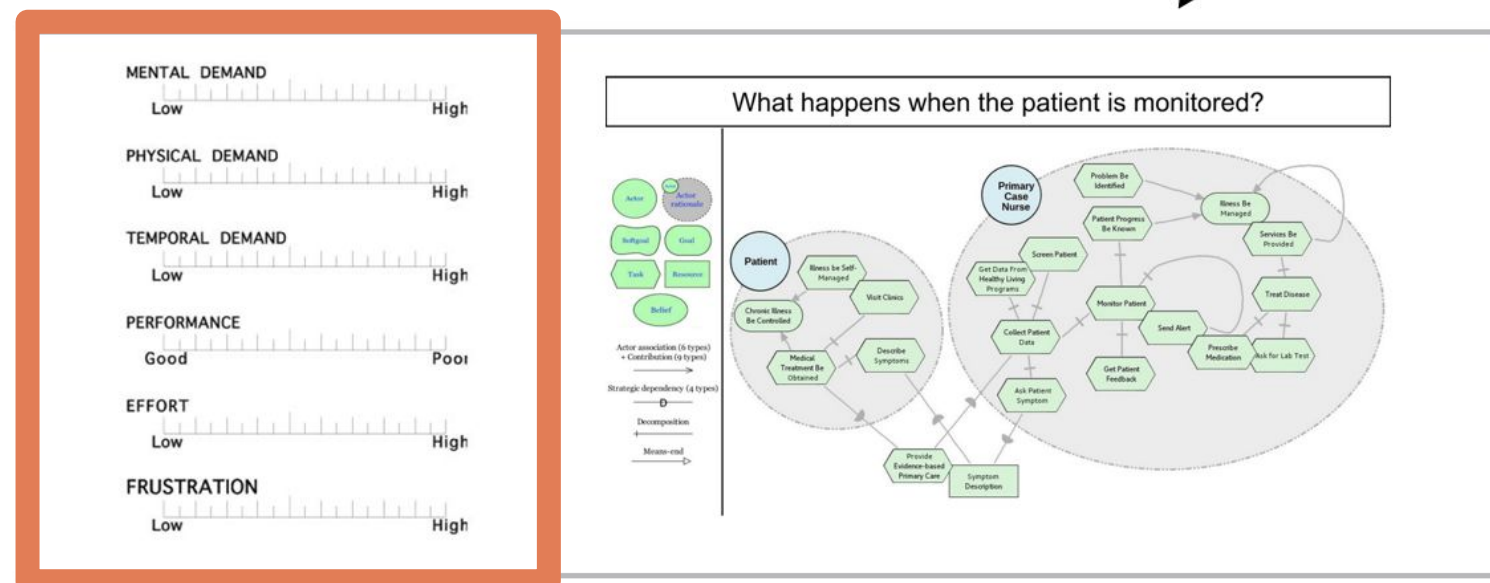
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A sua resposta

Field of Studies *



Answer to demographic questions

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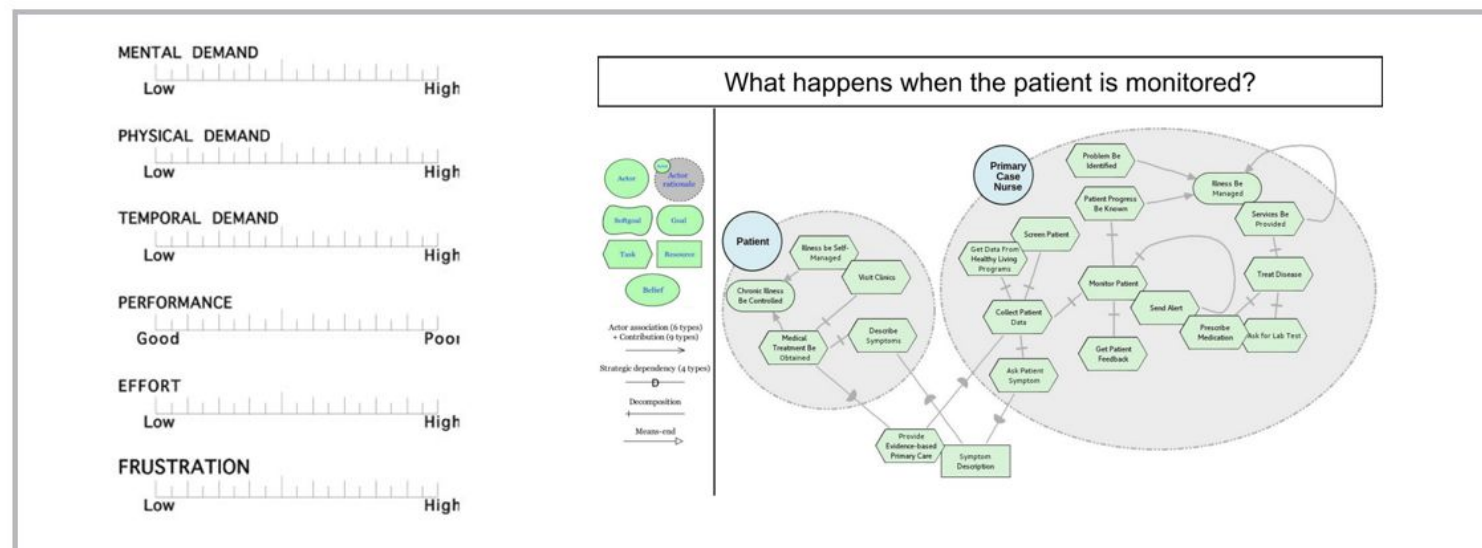
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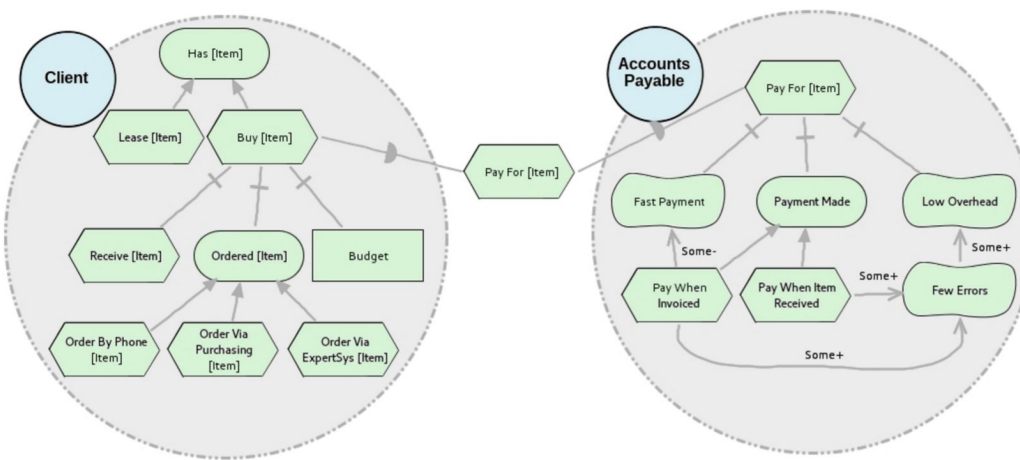
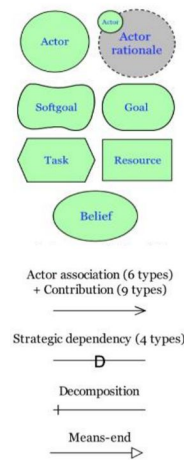
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Field of Studies *

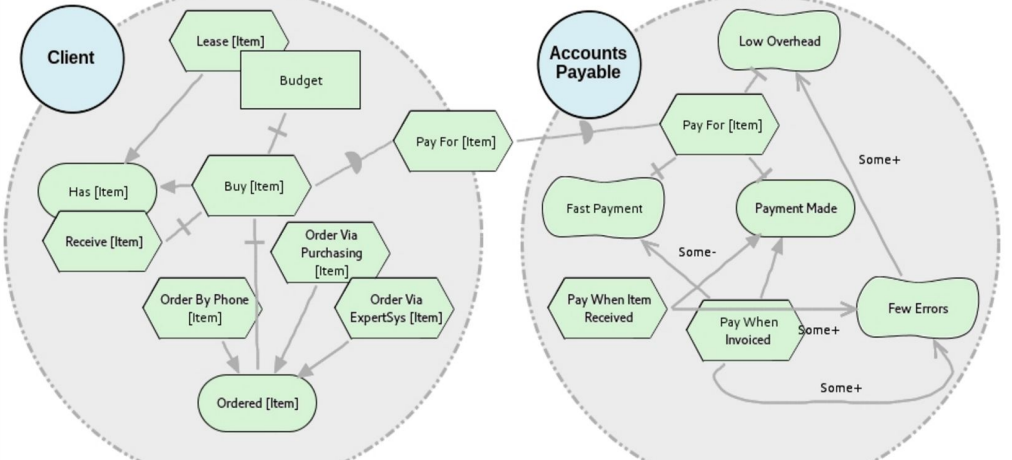
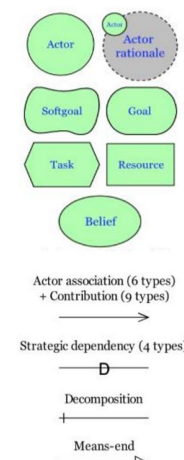


Two understanding and two review tasks, both with good and bad layout

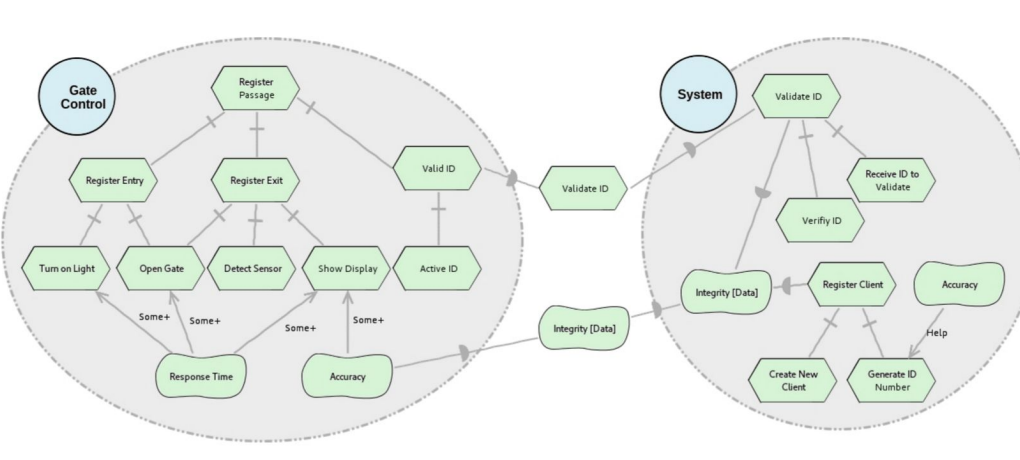
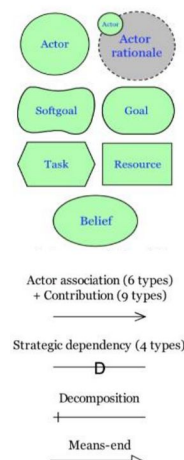
Which tasks are involved in making payments?



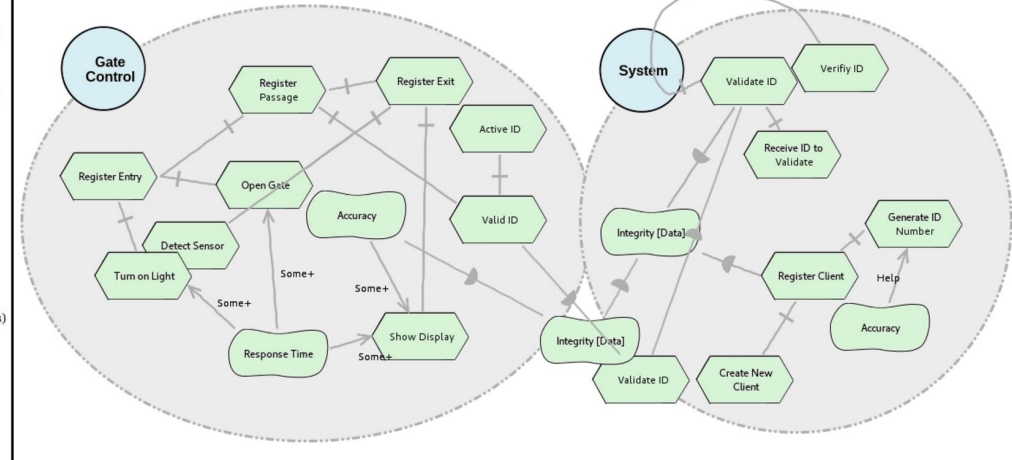
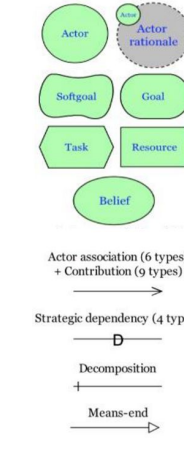
Which tasks are involved in making payments?



Please describe the defects you find in this diagram
(they can be more than one)

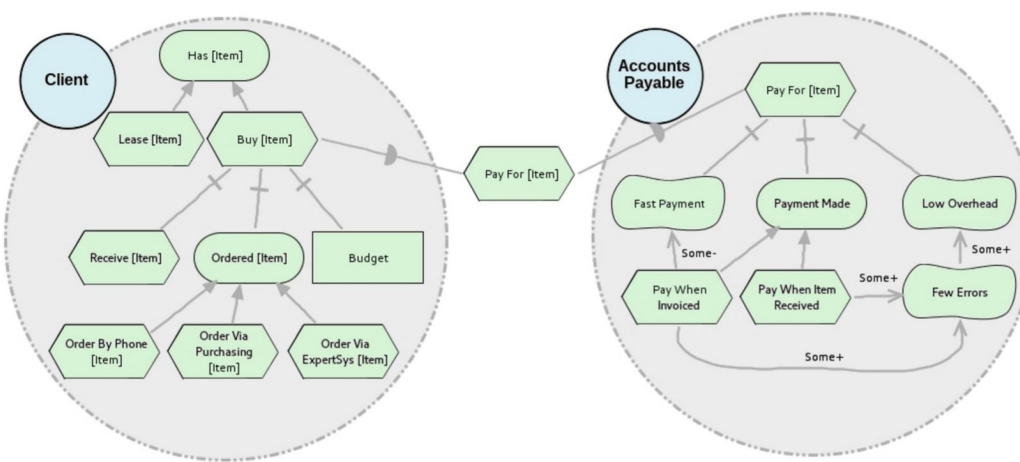
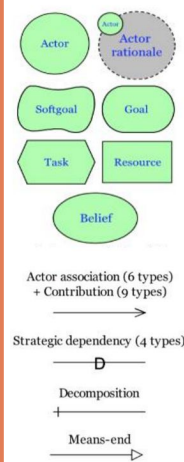


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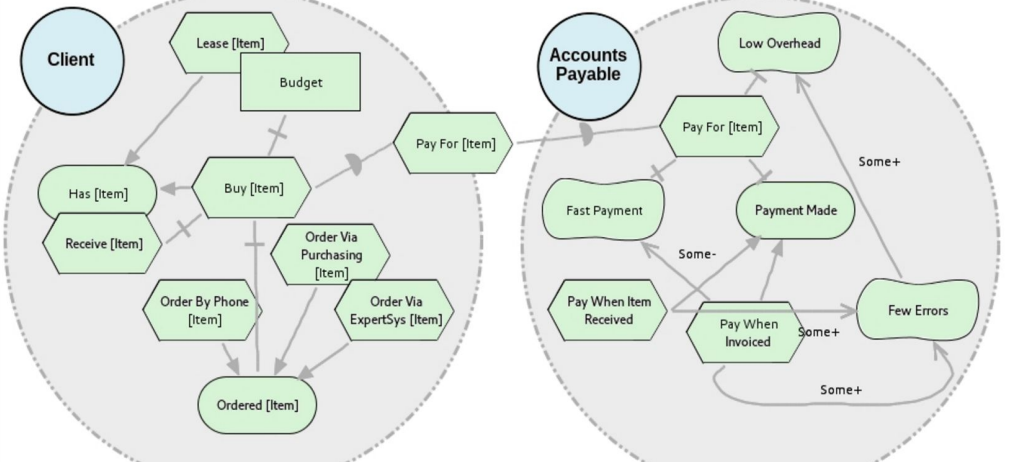
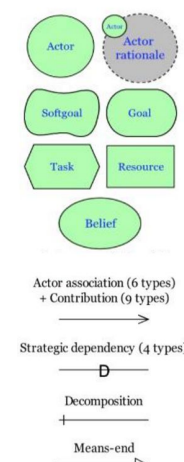


Two understanding and two review tasks, both with good and bad layout

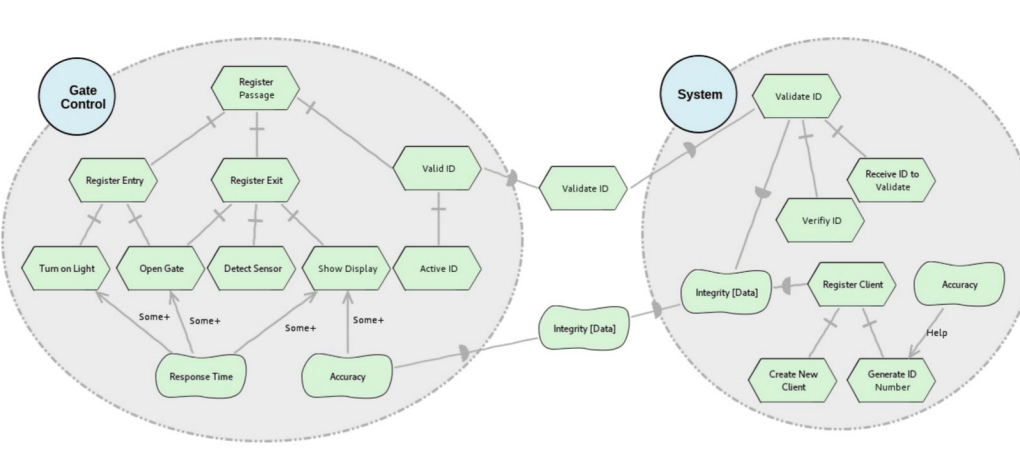
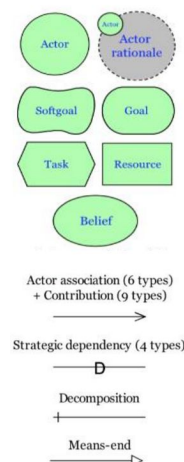
Which tasks are involved in making payments?



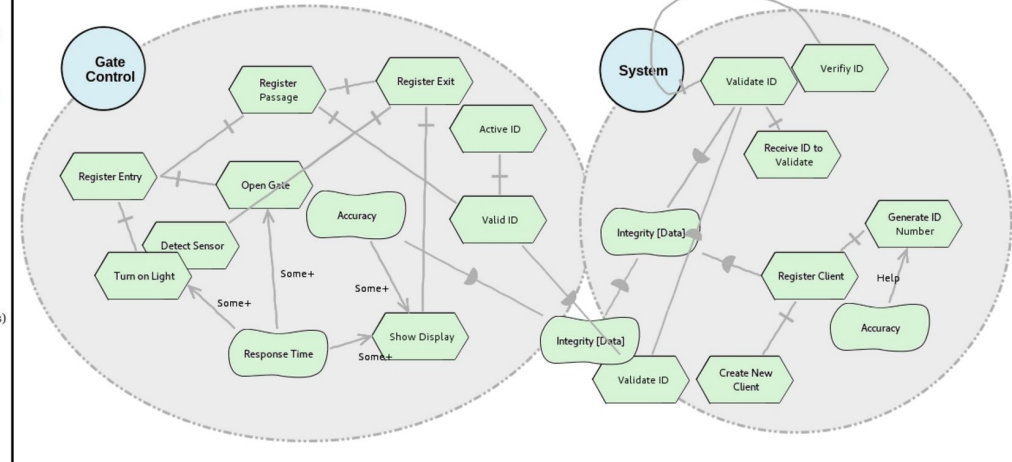
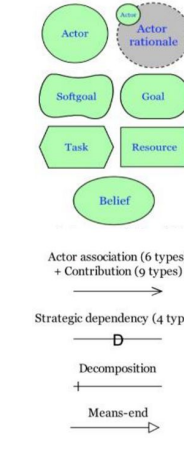
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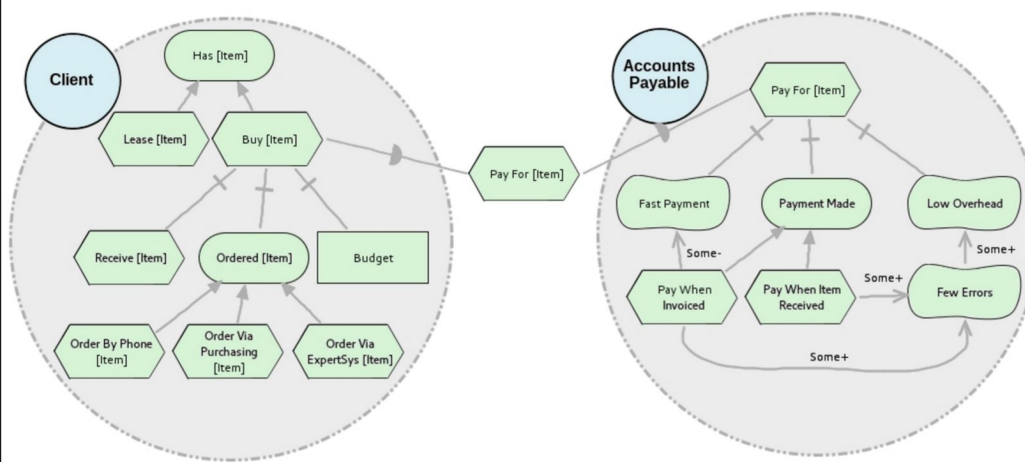
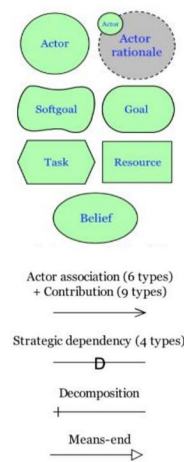


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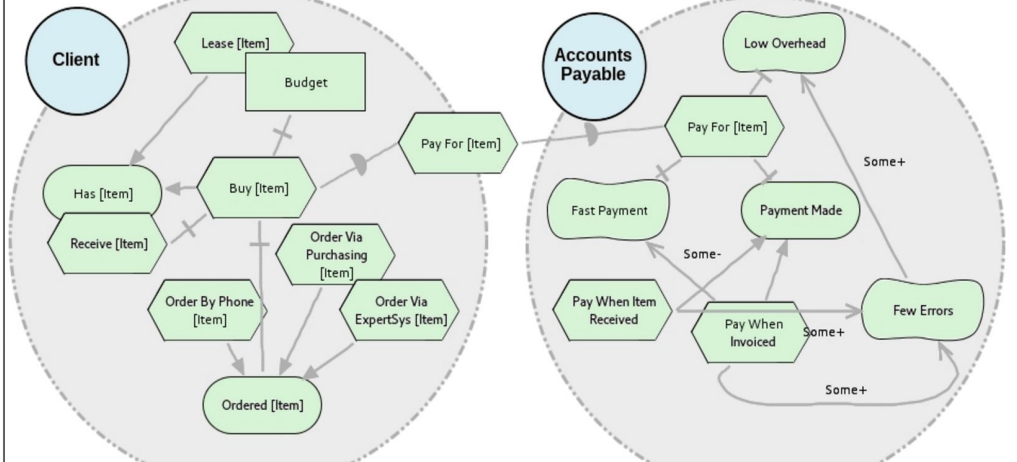
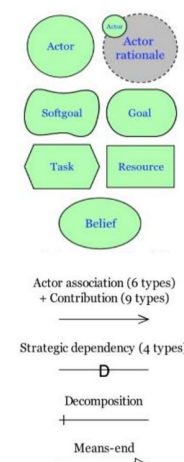


Two understanding and two **review** tasks, both with good and bad layout

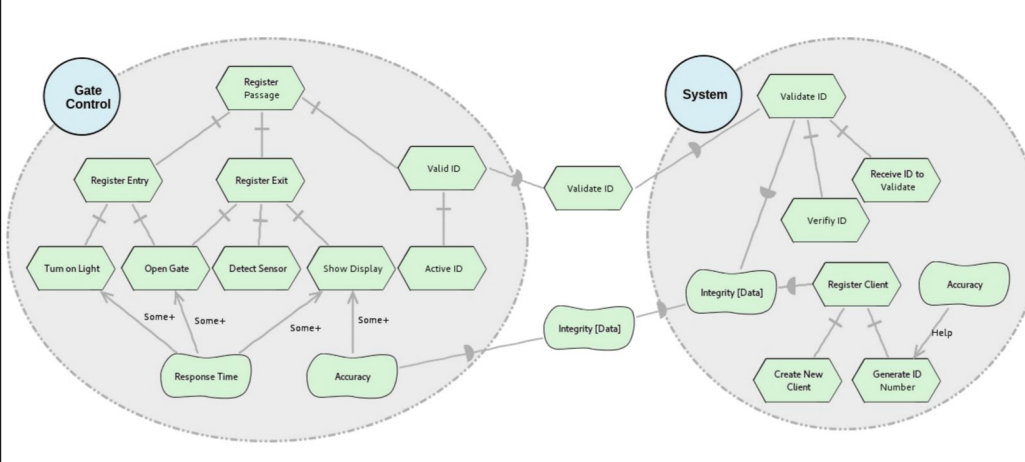
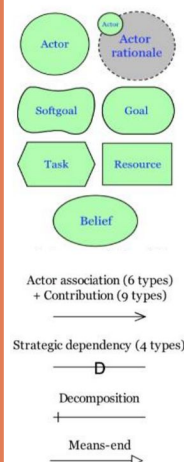
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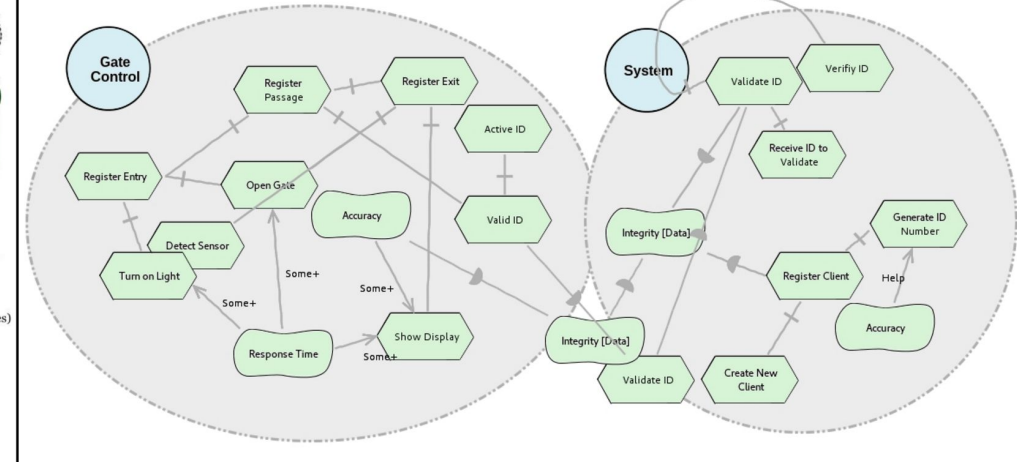
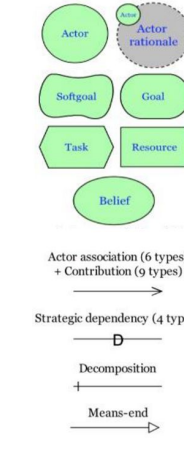
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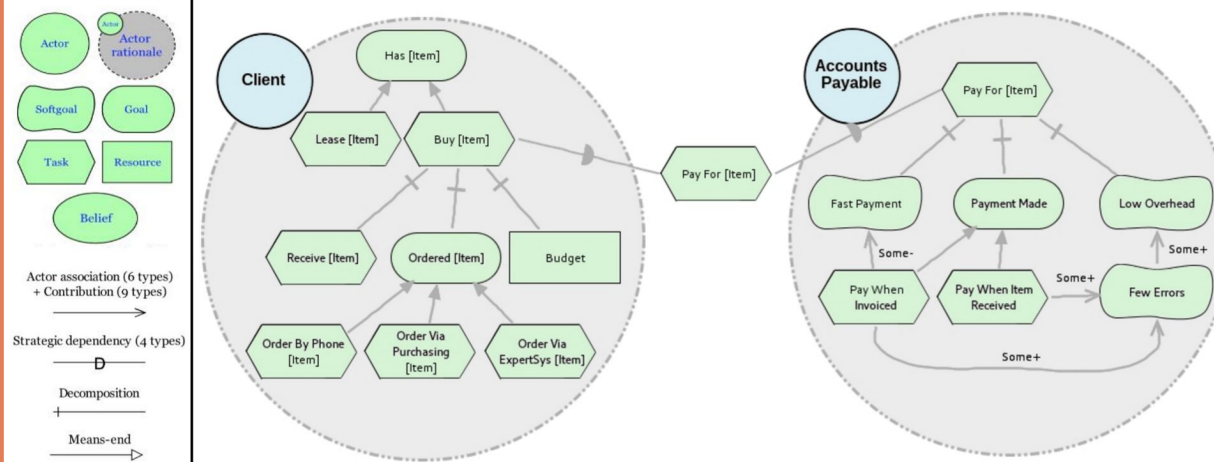


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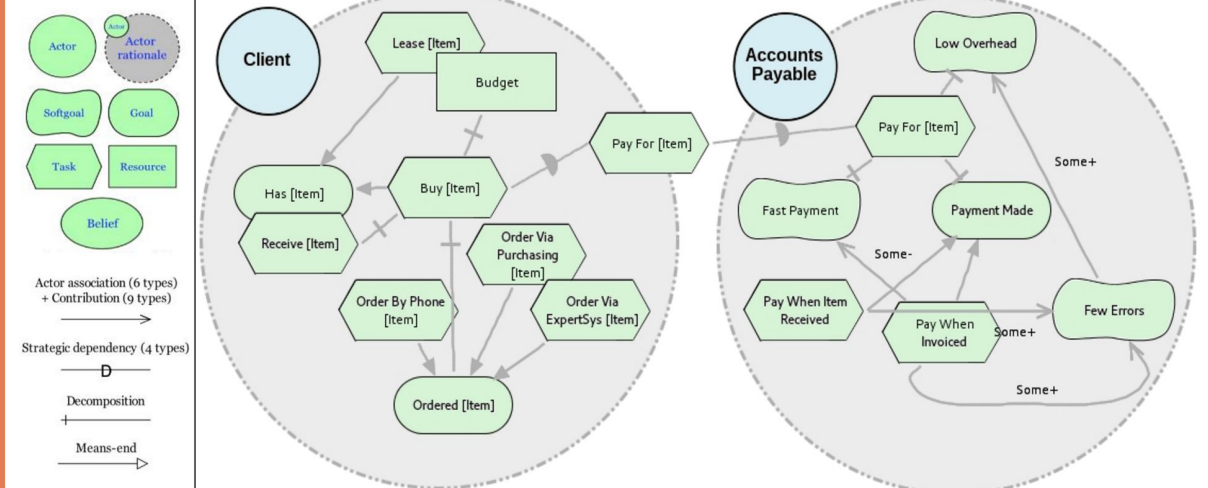


Two understanding and two review tasks, both with **good** and bad layout

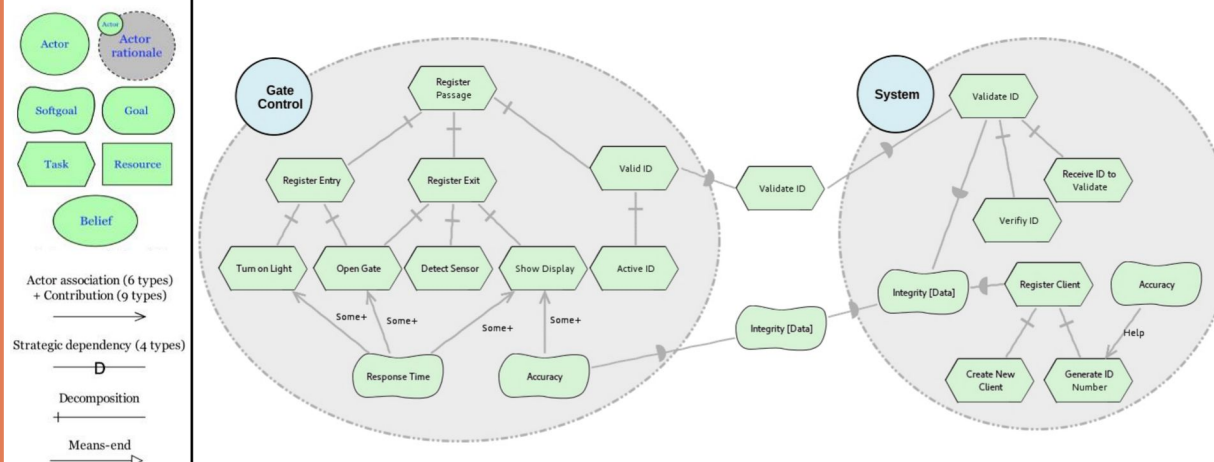
Which tasks are involved in making payments?



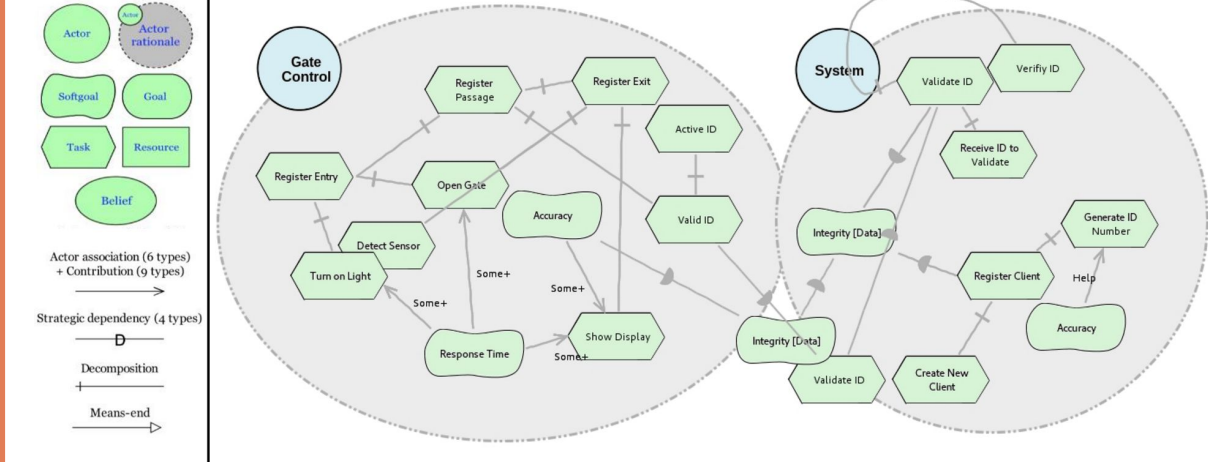
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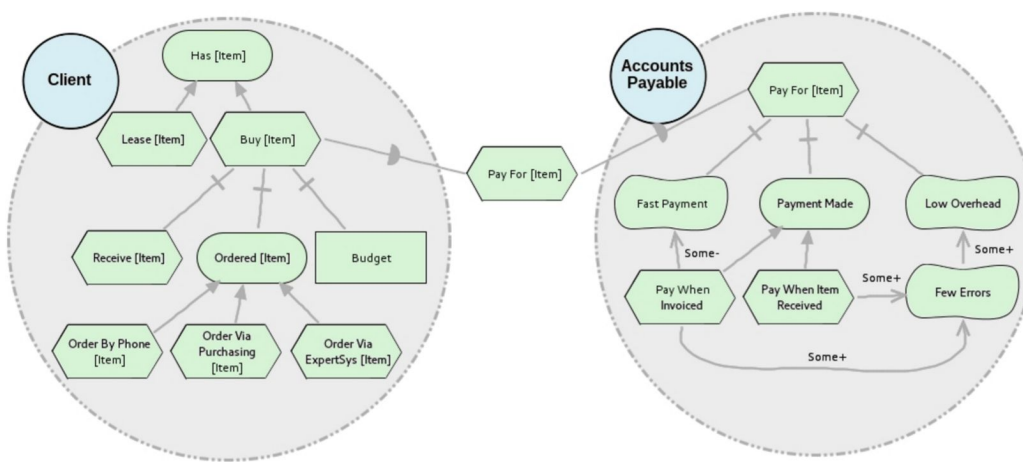
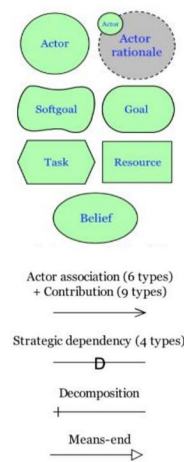


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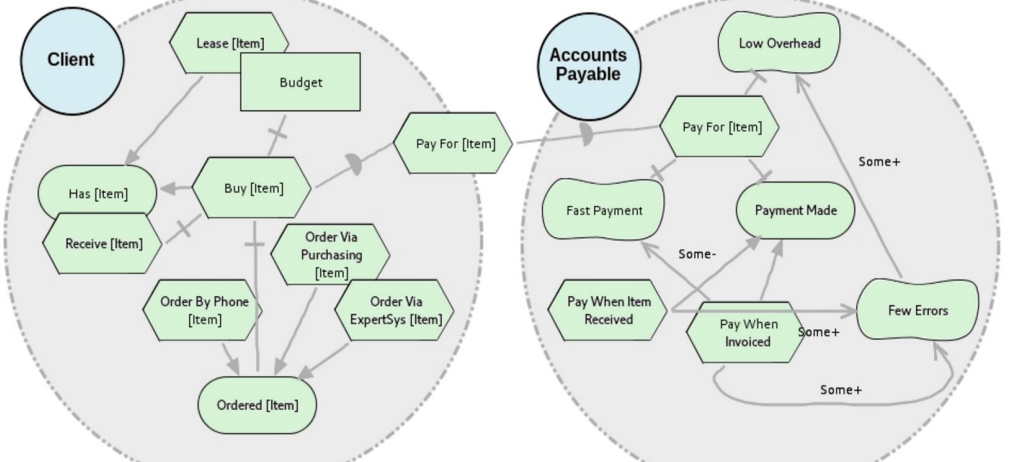
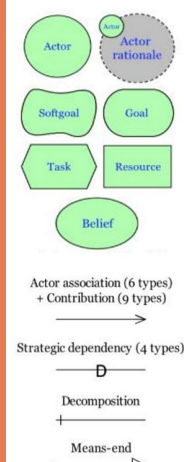


Two understanding and two review tasks, both with good and **bad** layout

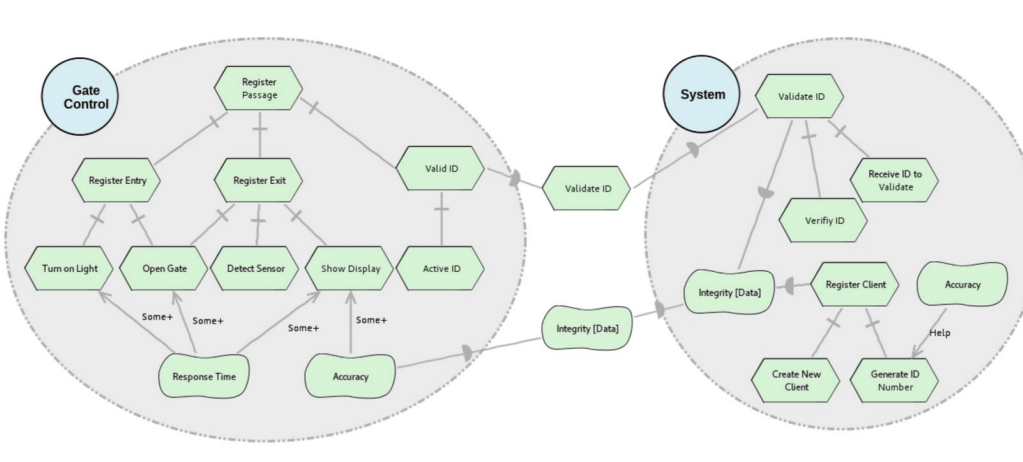
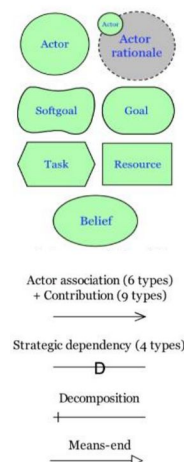
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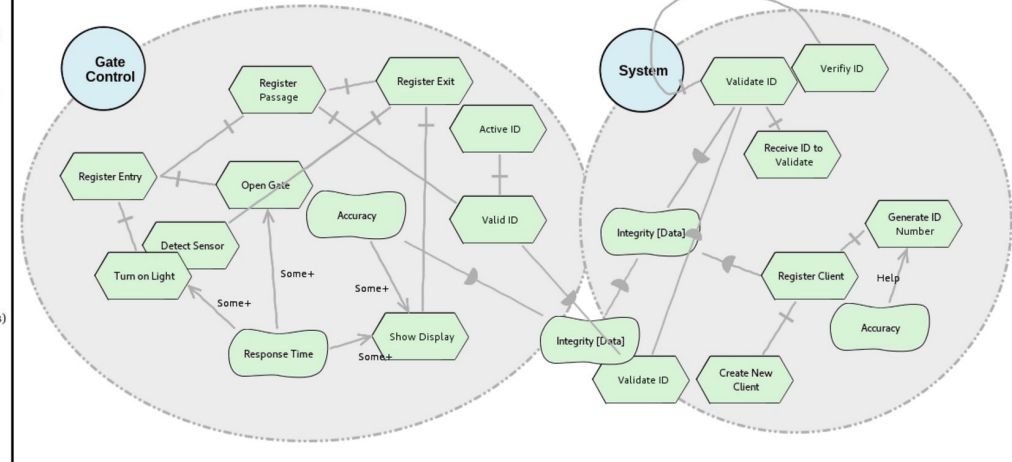
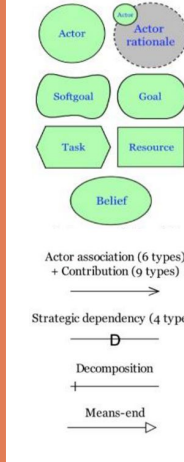
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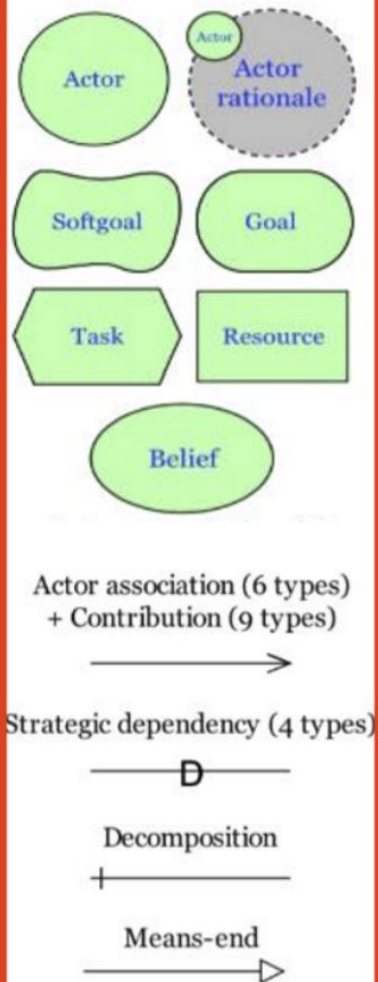


Areas of interest: question, key and model

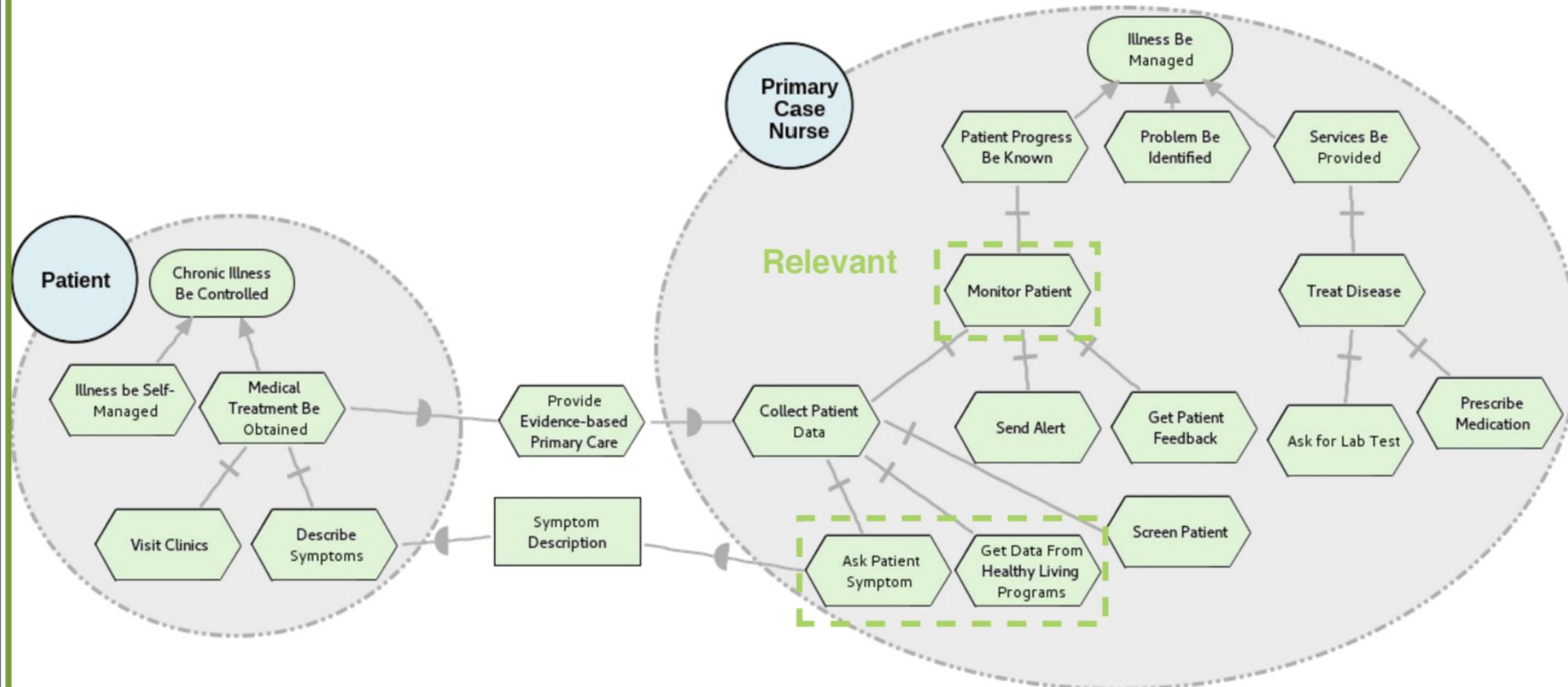
Question

What happens when the patient is monitored?

Key



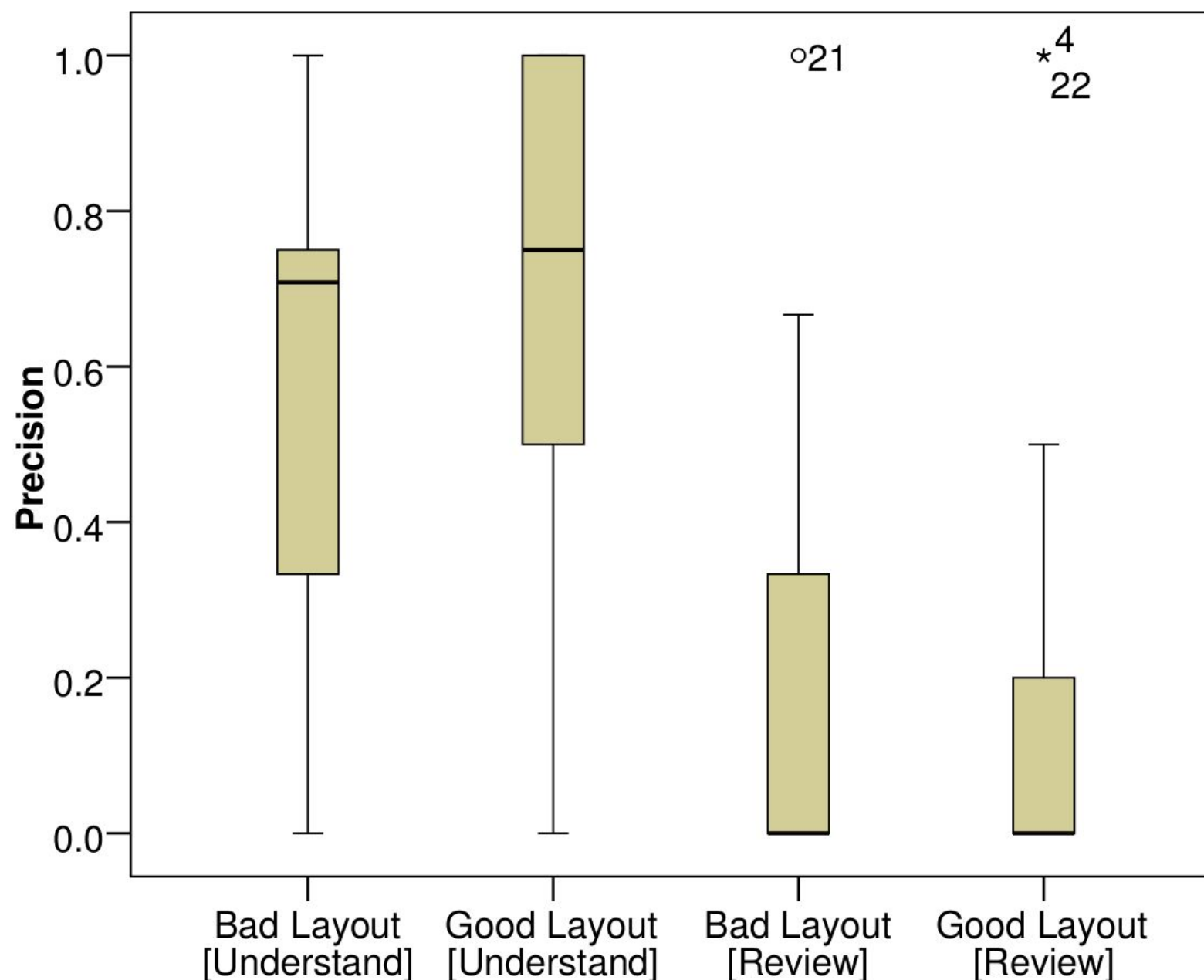
Model



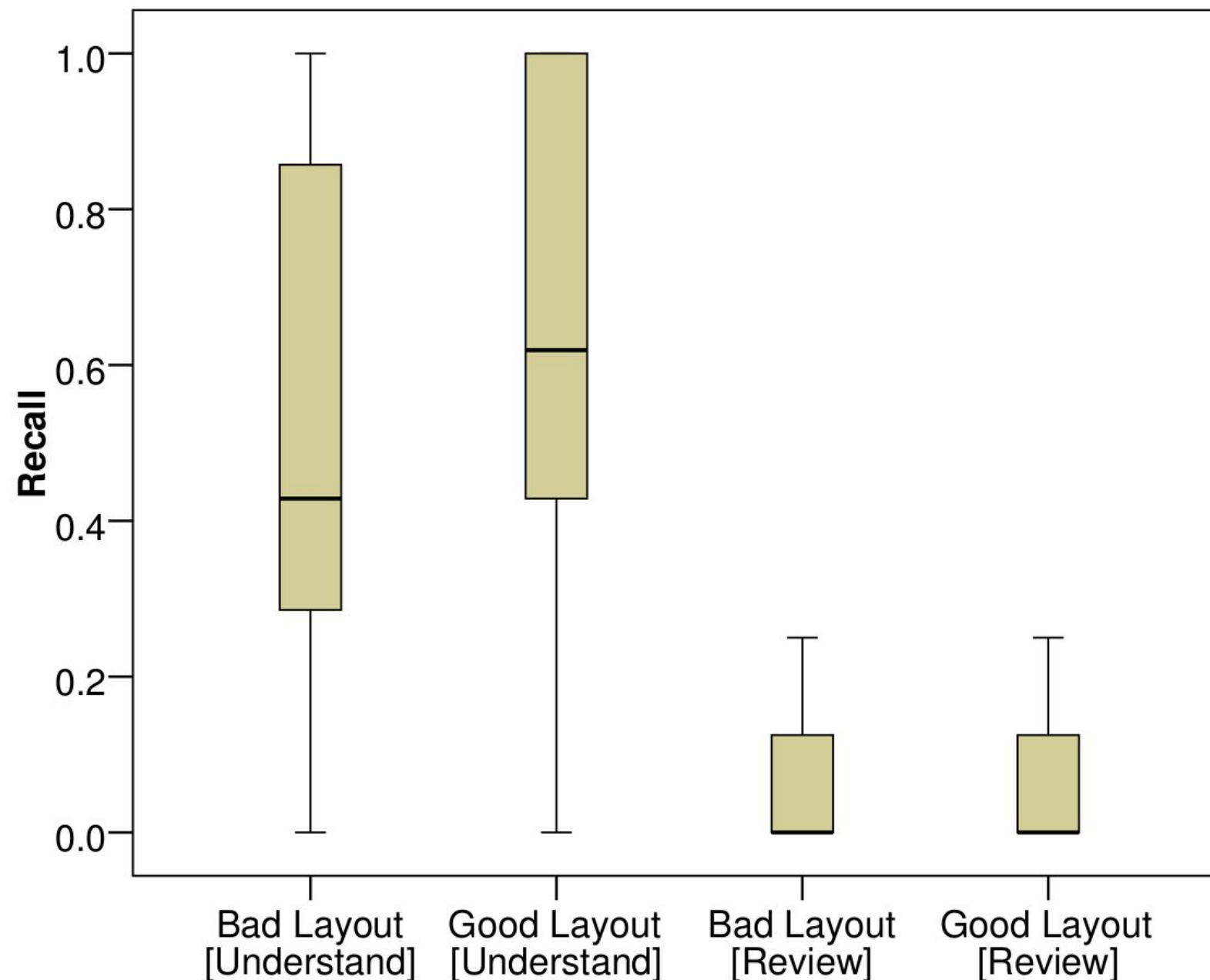
So what was the impact of good and bad layouts in understanding and reviewing i^* models?



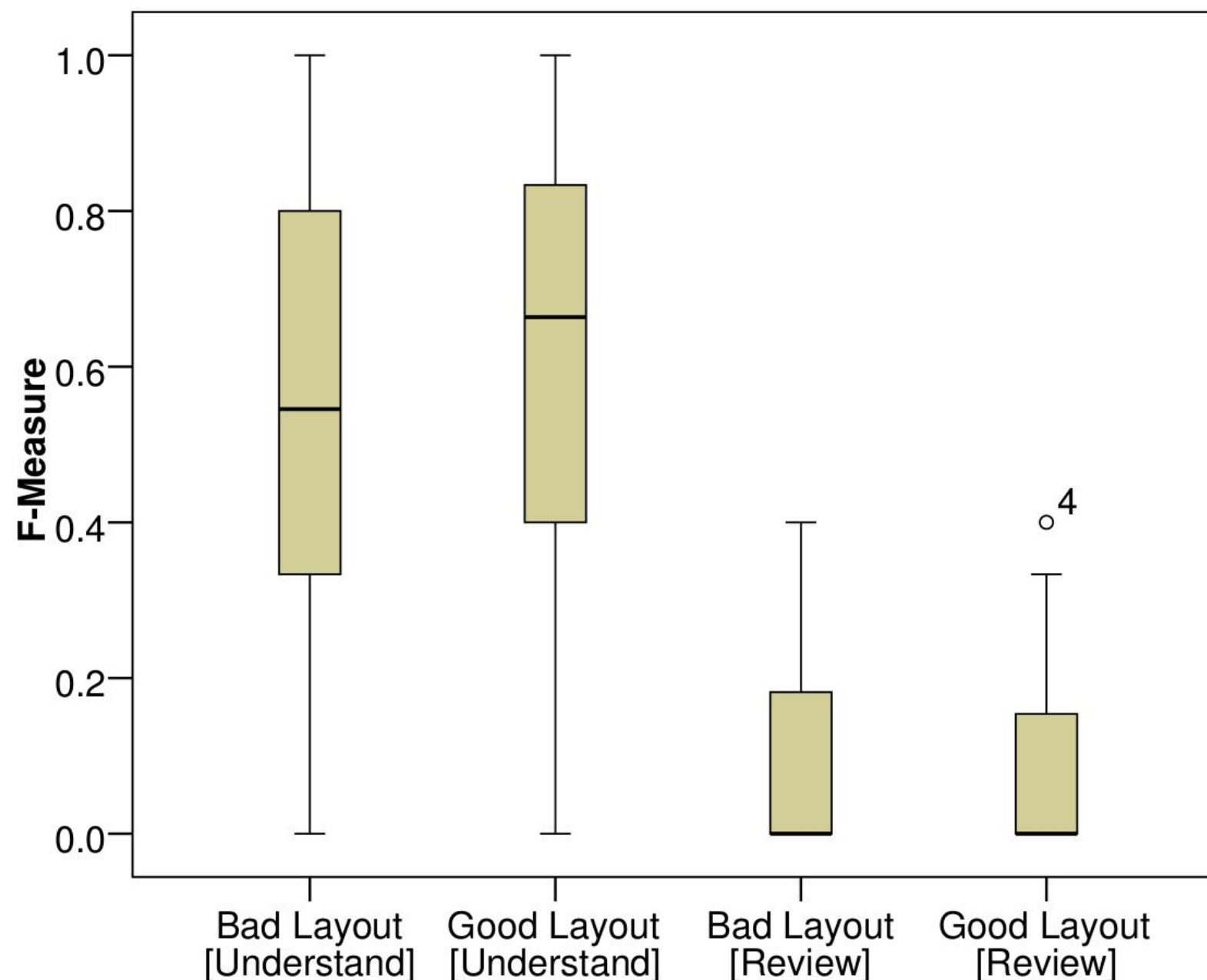
Precision is higher for understanding tasks,
but there is no statistically significant
difference between layouts



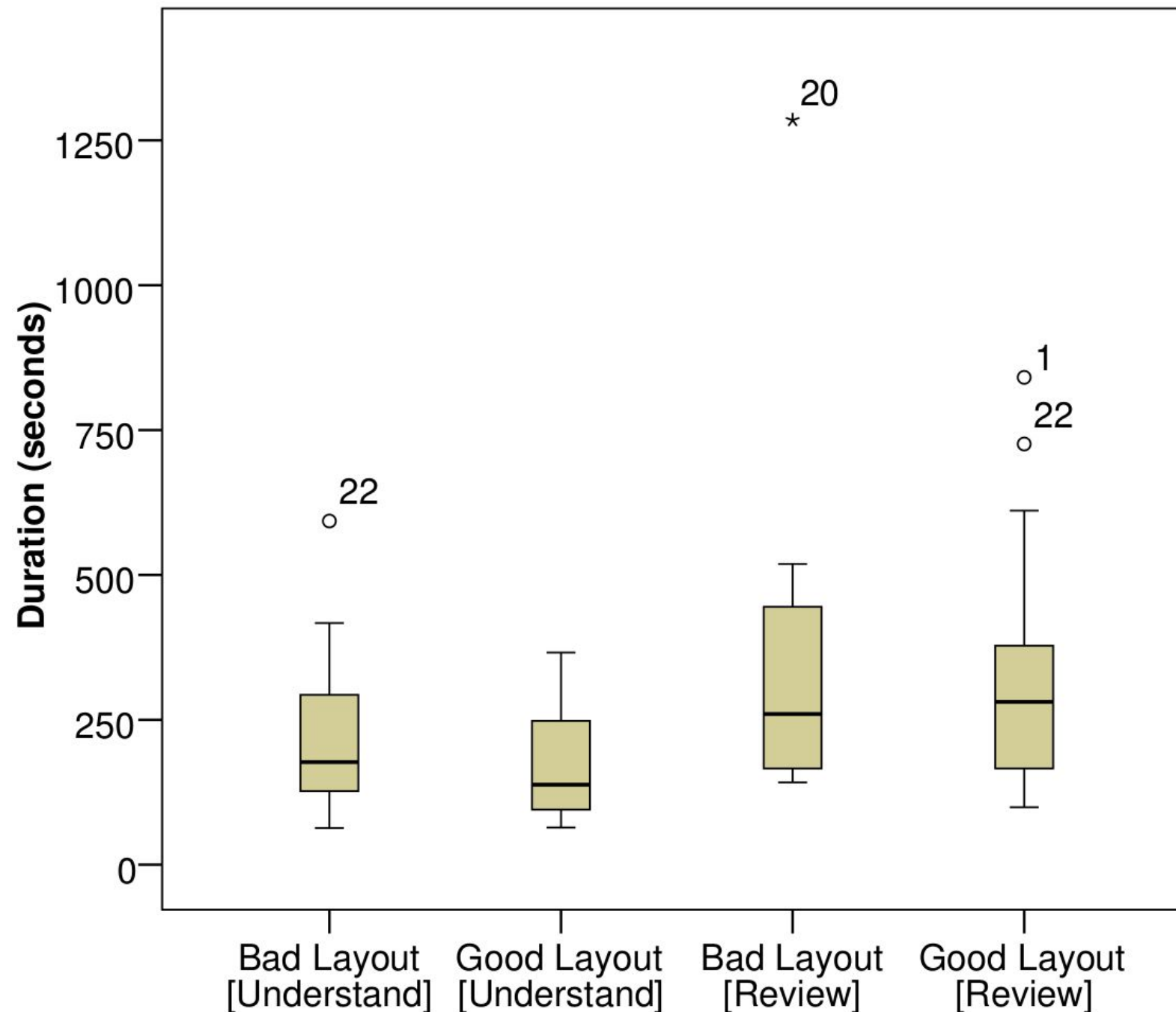
Recall is better for understanding tasks with good layout, but the difference is not statistically significant



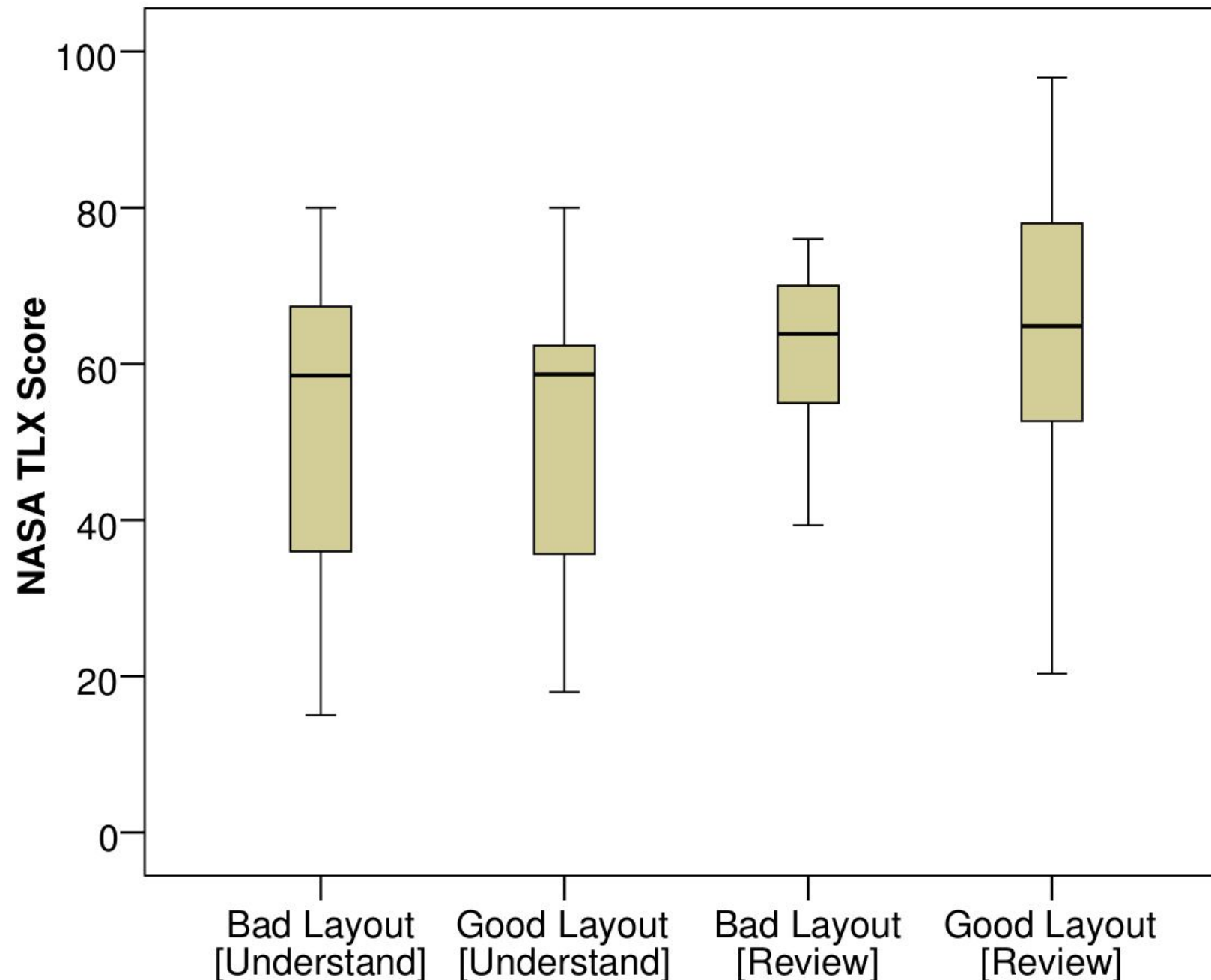
F-Measure is better for understanding tasks with good layout, but the difference is not statistically significant



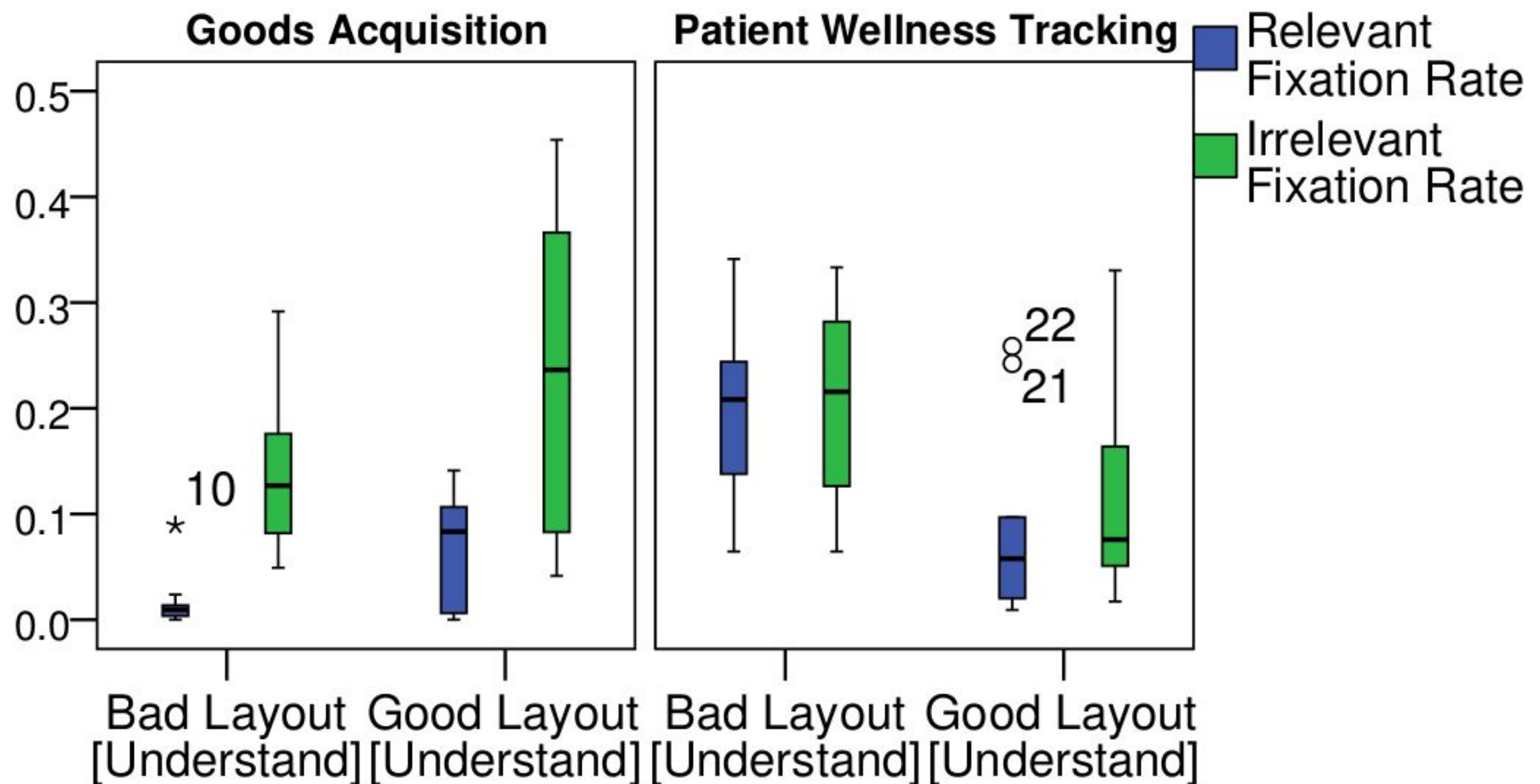
There is no difference in terms of **duration**, between good and bad layouts for both tasks



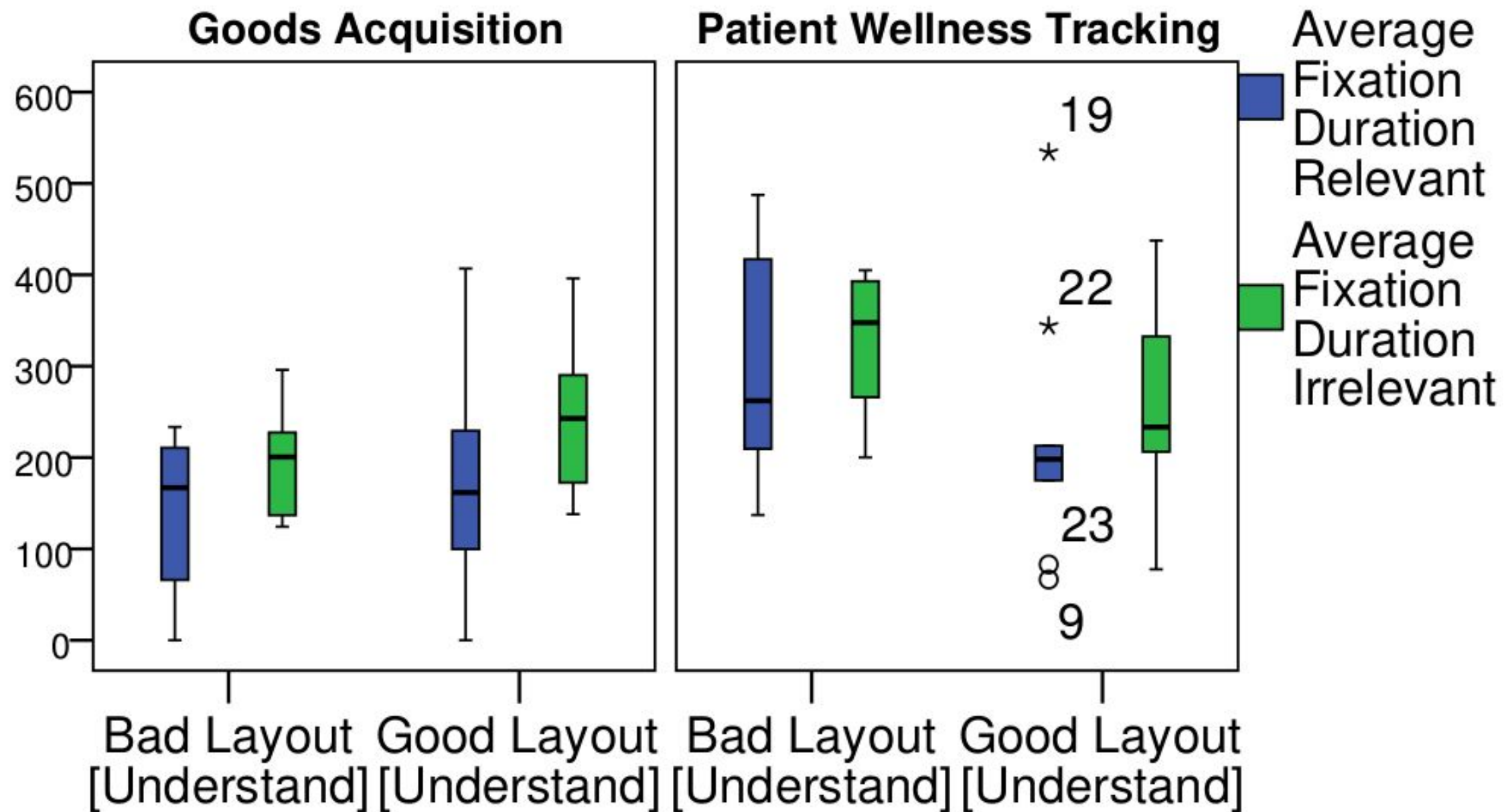
There is no difference in the **perception of complexity** of the tasks, for both layouts



Relevant **fixation rates** were superior in understanding tasks, but the difference for layouts is not statistically significant

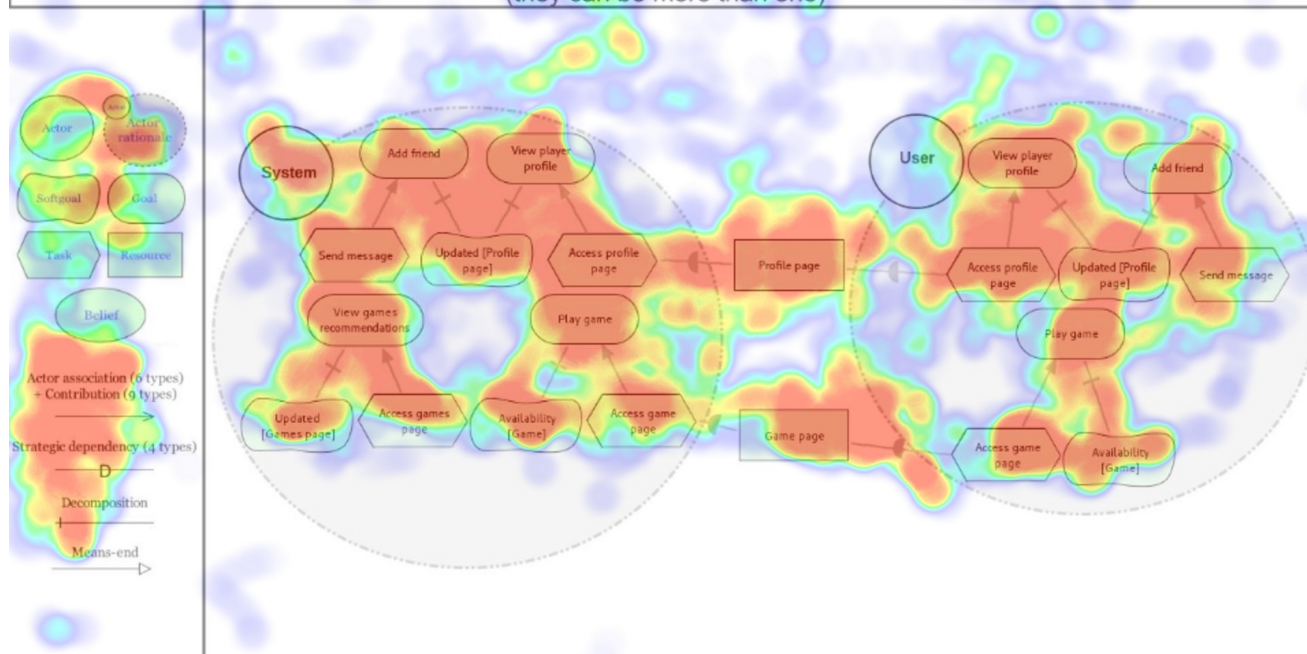


Average fixation duration varies depending on the model, but the difference is not statistically significant

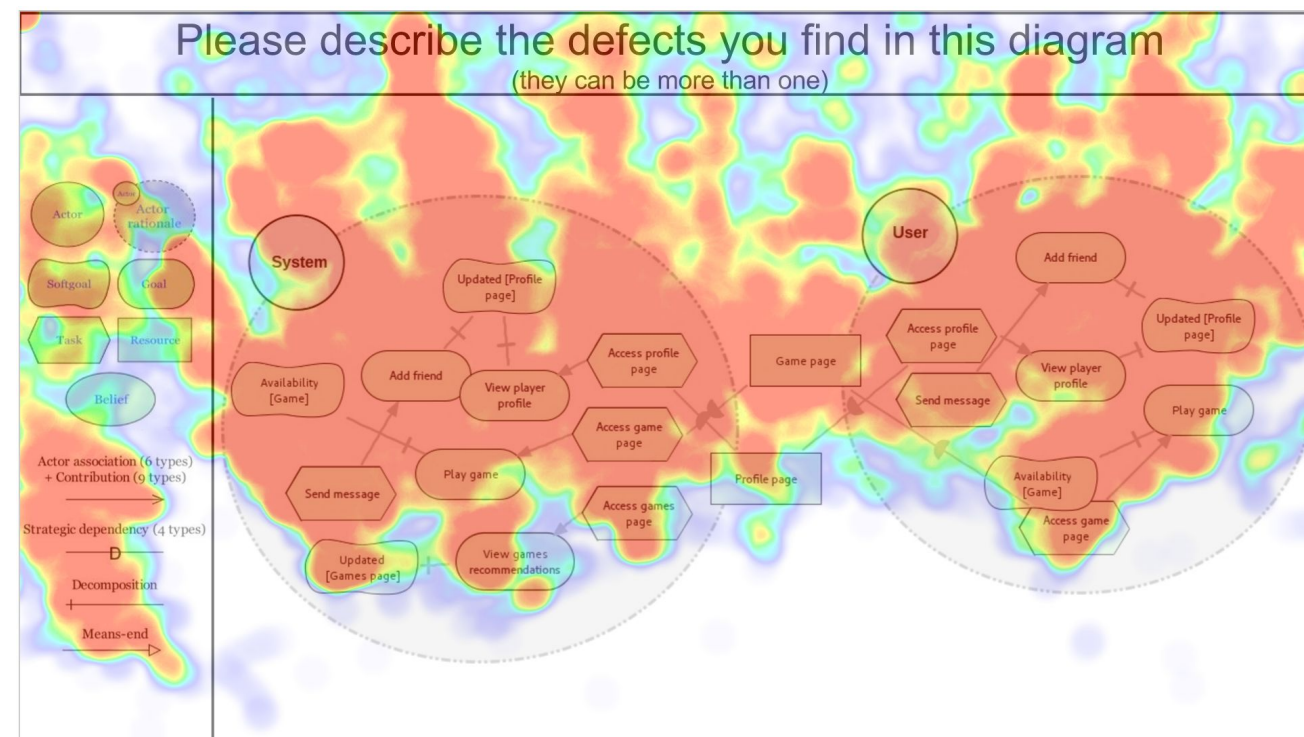


Heat map for the good layout is less scattered than the one for bad layout

Please describe the defects you find in this diagram
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Conclusions

Understanding tasks were more accessible than reviewing tasks

The layout was not a significant factor for any of the measures,
for both understanding and review tasks

In heap maps for the review tasks, participants' gaze seemed
more dispersed by the noise cause by bad layouts

We expect layout quality to have a stronger impact as diagrams
increase in size and complexity

Thank you!
Questions?



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