UNIVERSITÀ DI PISA

BPM PROJECT REPORT

PARKING PERMIT

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1. INTRODUCTION

The problem at hand that we have is the renewal of a parking permit for a citizen for his/her residence zone. To carry out the process, different cases and different possibilities have to be kept in mind, while we model the solution of the problem. First of all, we list the actors that should interact with each other so as to carry out the procedure in a correct manner. In the scenario presented to us we have two actors, namely:

- Citizen
- Municipal Office

The BPMN language will be used to model the processes, and the tools utilized to complete the project include Visual Paradigm for modeling the two connected pools, and WoPed was used for workflow analysis. The citizen initiates the procedure by sending an information request to the municipal office to ask for information and to get a list of forms to be filled and of documents to be prepared.

When the citizen receives the information from the other actor, he/she delivers all documents and forms. These are checked by an officer in the municipality carefully and a decision has to be taken whether to release the permit, to revoke the permit, to ask for missing information or whether any revision is required in some forms.

There is no restriction on the number of times the required forms or documents can be delivered by the citizen to the municipal office until the parking permit is released to the citizen or it is revoked. The same goes for the number of times these forms or documents are analysed by the municipality.

Also the process of the office worker has been modeled in such a way that he/she will continue to ask for forms revision at each iteration and analyze the overall system.

2. BPMN MODEL

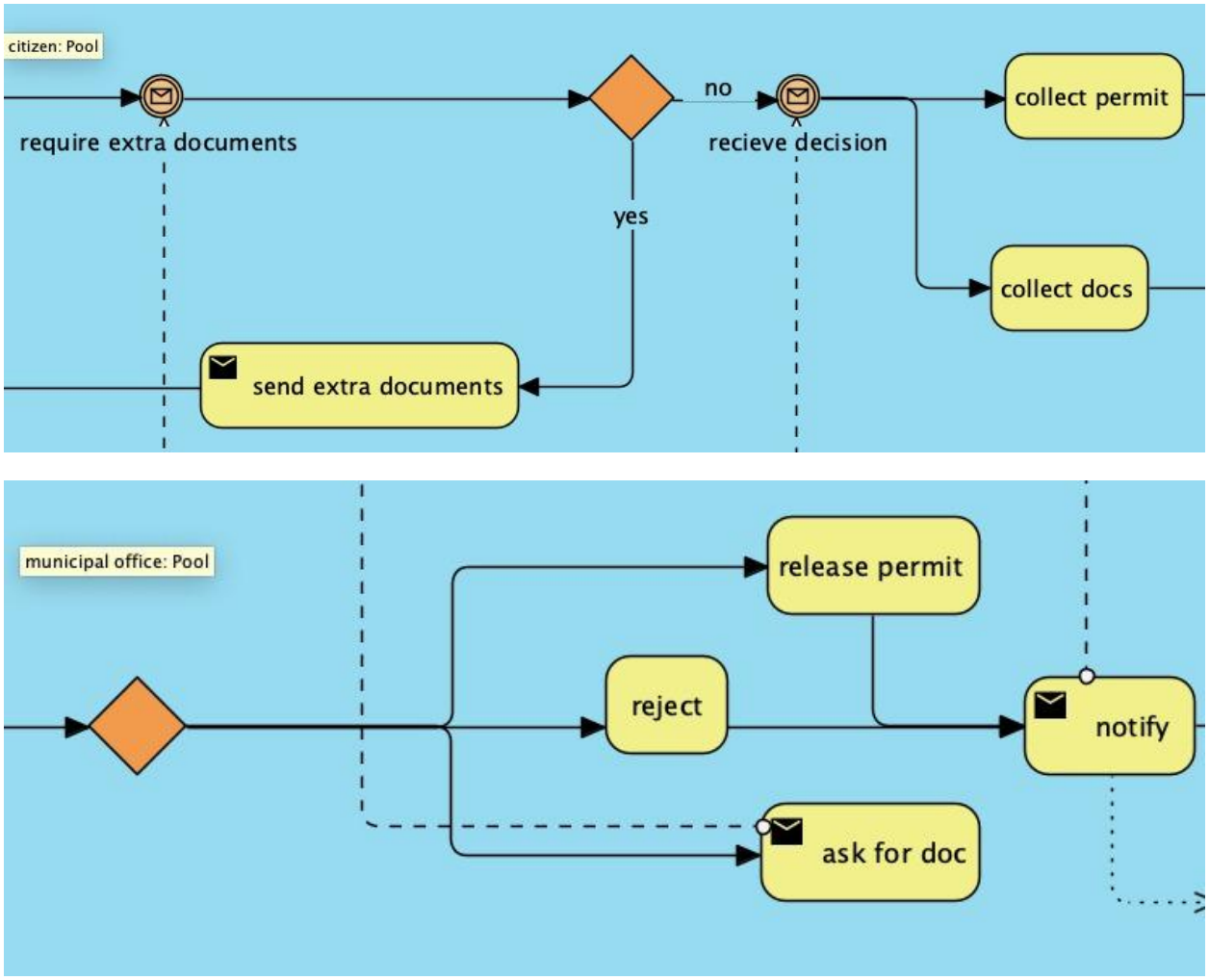
The implementation of the model for the given specified problem will be presented. BPMN was used to do it, and it was constructed on the Visual Paradigm platform. Each actor is represented by a separate pool. In our problem the main actor is the citizen.

The procedure starts with a citizen who wants to renew his parking permit for his residence zone in the citizen pool. Most of the jobs, such as the firsts, in which the citizen requests information, are communication tasks, and a separate flow is made for the municipal office. This helps in maintaining the logic sequence.

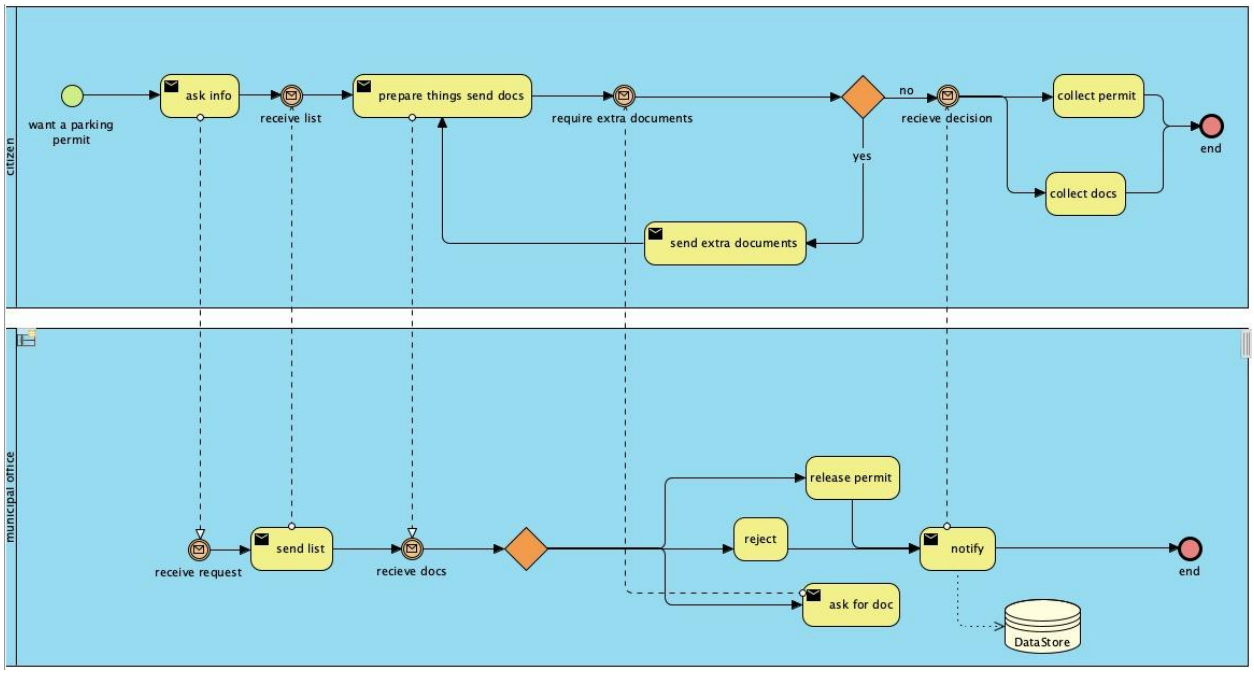
“Ask info” is generating the initiation of the process i.e. the message from the citizen to the municipal office. It makes both the actors get involved in the process. Since the citizen might be asked to resubmit/modify the forms or to provide missing information, we added a loop.

Once the document is submitted, the municipality makes an analysis which is represented by XOR gateway where an officer from the municipal office chooses between asking for extra information, rejecting the application or to grant the permit. In case of rejection or granting of the permit, the municipal office notifies the citizen to either collect the permit or to collect back the documents. The municipality can also ask the citizen to provide additional forms or documents until it either grants or rejects the permit application.

In the images below we represented the XOR choice with the brown diamond, in both the cases of citizen and municipality.



The process has been made in a way that the office worker can continue to ask for forms revision and extra documents at each iteration and analyze the overall system.

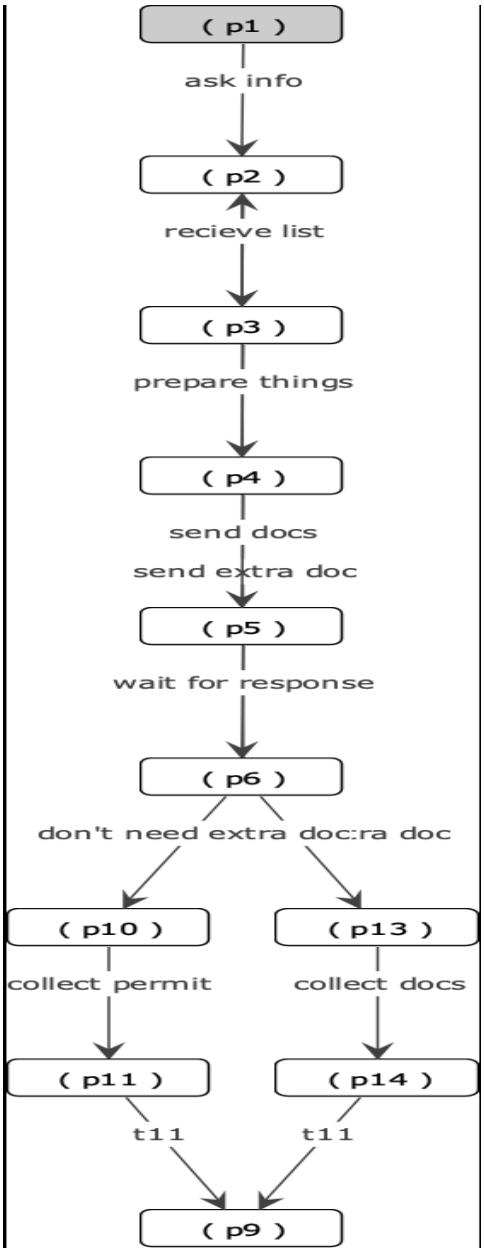


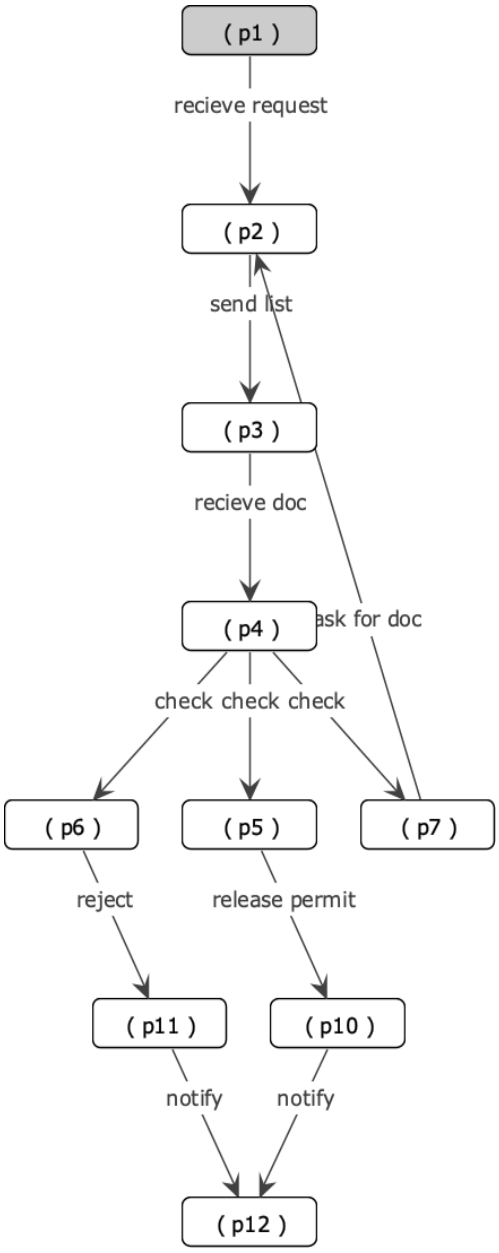
3. WORKFLOW ANALYSIS

We moved to another level of representation after implementing the problem using the BPMN model in order to analyze certain fundamental aspects relevant in describing our model building. The language we used to do it was Petri-net, and the platform we worked on was WoPed, which allowed us to explore the model more thoroughly and verify its validity. We'll go over each one individually and the petri net workflow model and the WoPed properties analysis will be presented in each section.

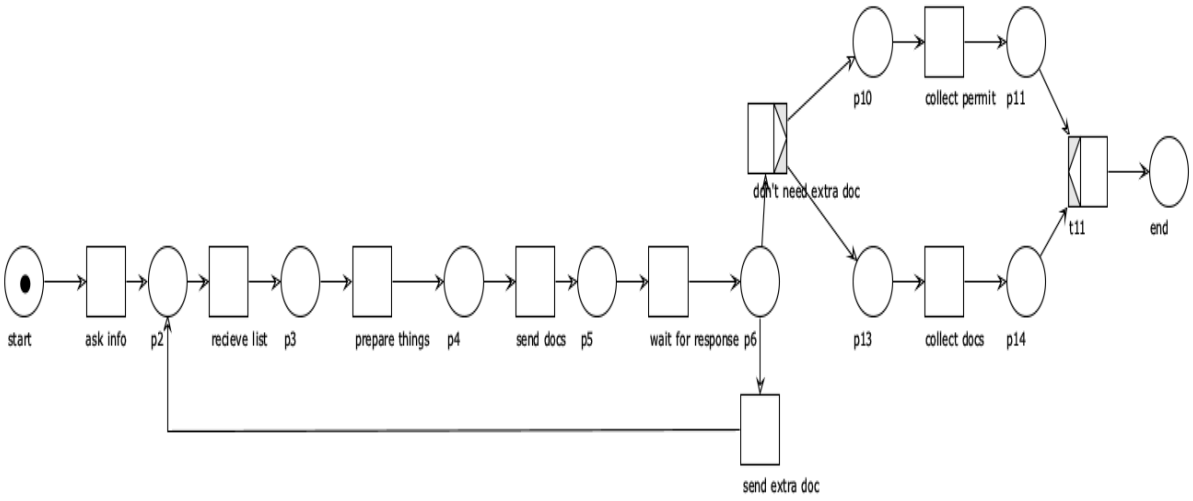
The reachability graphs are shown first.

Since both the workflow nets are bounded, the reachability graphs were successfully created without any need for approximation.


(p1)
ask info
(p2)
recieve list
(p3)
prepare things
(p4)
send docs
send extra doc
(p5)
wait for response
(p6)
don't need extra doc:ra doc
(p10)
(p13)
collect permit
collect docs
(p11)
(p14)
t11
t11
(p9)

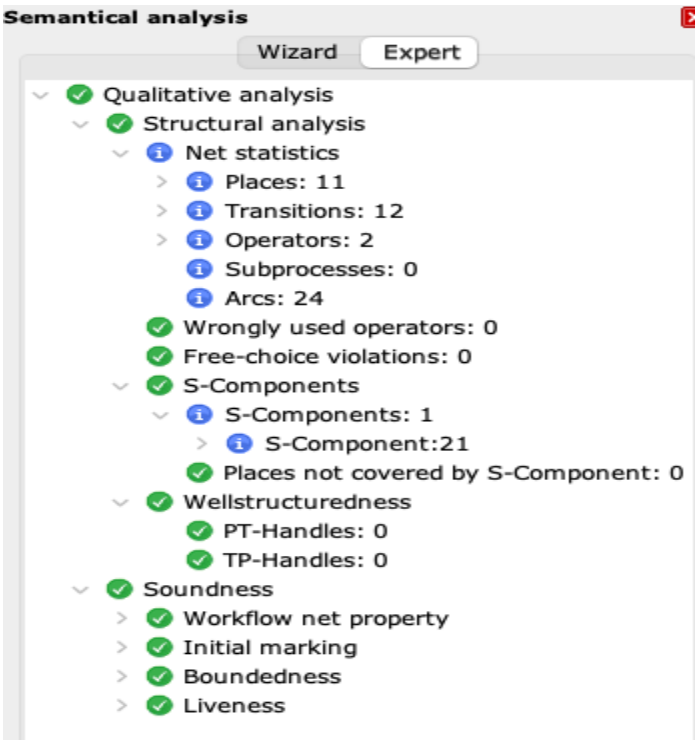

(p1)
recieve request
(p2)
send list
(p3)
recieve doc
(p4)
ask for doc
check check check
(p6)
(p5)
(p7)
reject
release permit
(p11)
(p10)
notify
notify
(p12)

CITIZEN

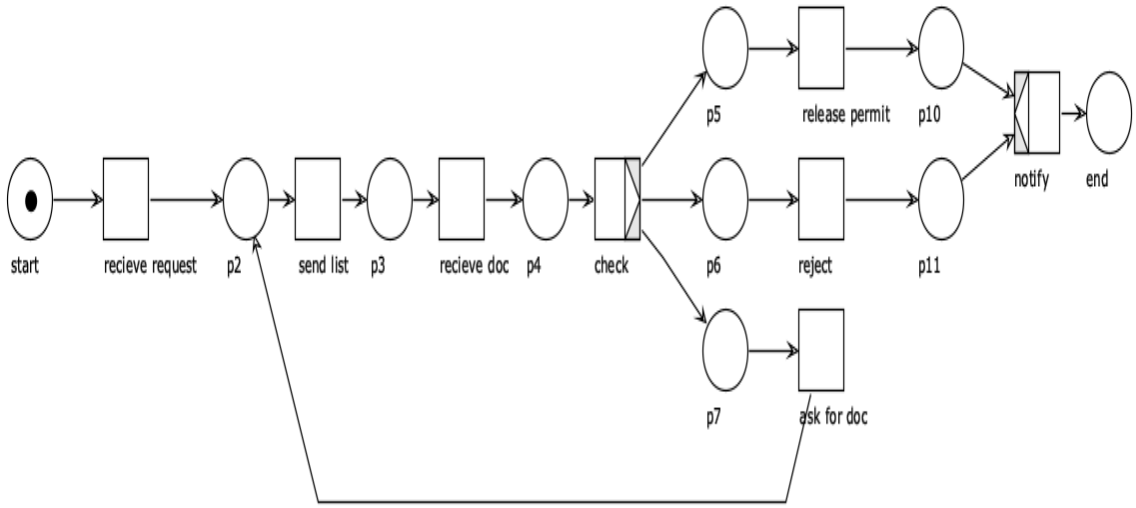


The Citizen Net is:

- an S-system
- without Free-choice violations
- deadlock free
- all soundness requirements are satisfied
- very well handled and very well structured too; it contains 0 PT-handles and TP-handles
- S-covered by one unique S-component to which all the 21 elements of the network belong

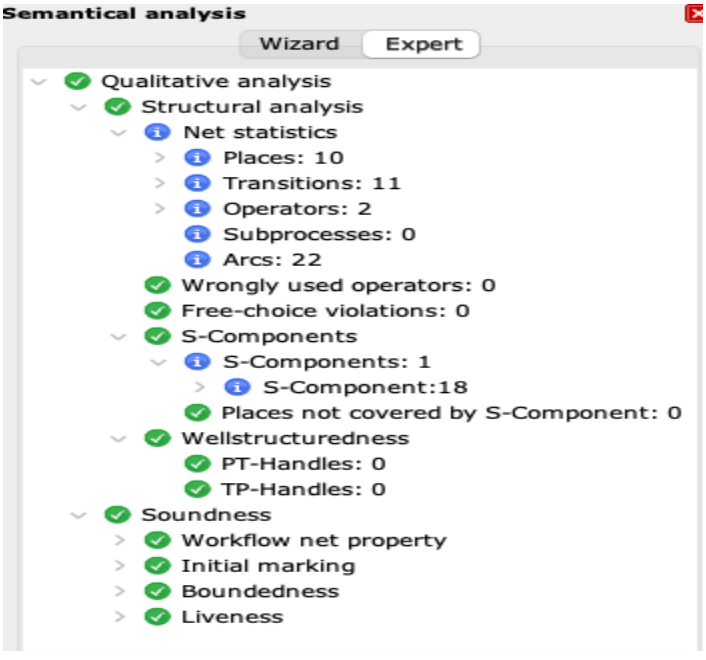


- MUNICIPAL OFFICE



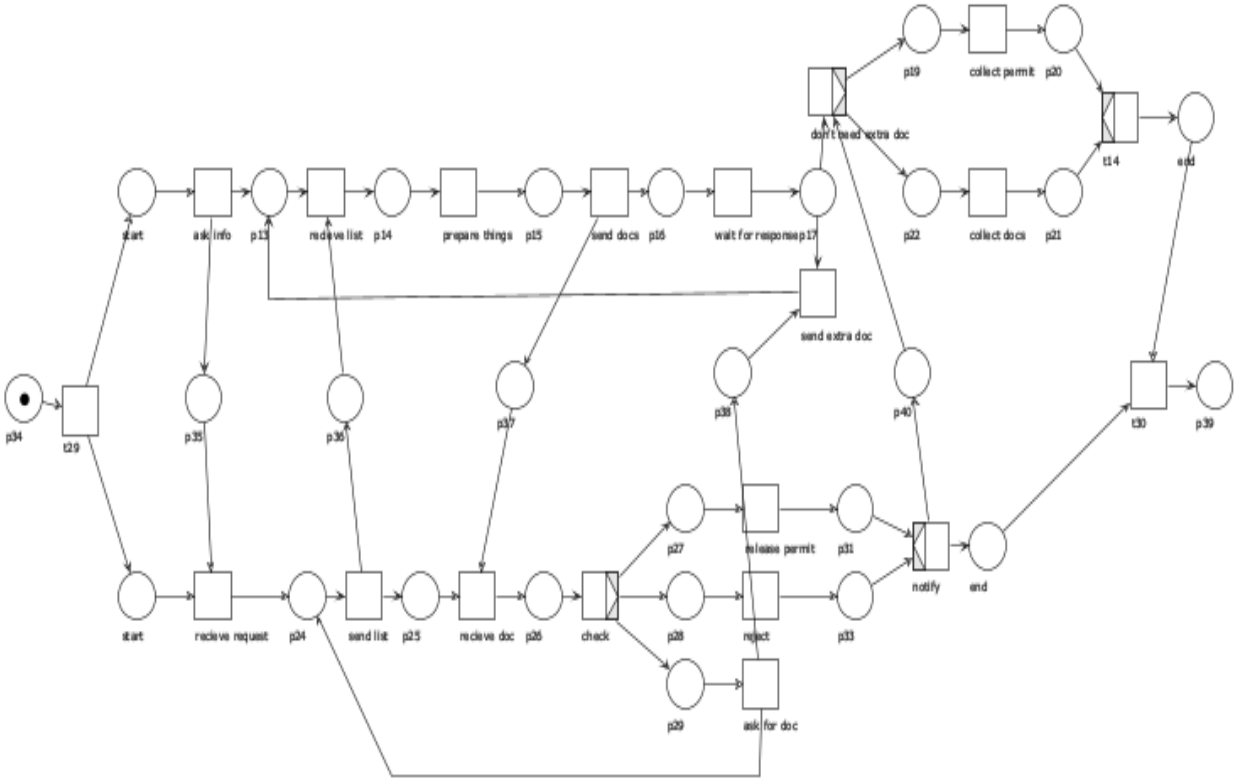
The Municipality Net is:

- an S-system
- without Free-choice violations
- deadlock free
- all soundness requirements are satisfied
- very well handled and very well structured too; it contains 0 PT-handles and TP-handles
- S-covered by one unique S-component to which all the 18 elements of the network belong



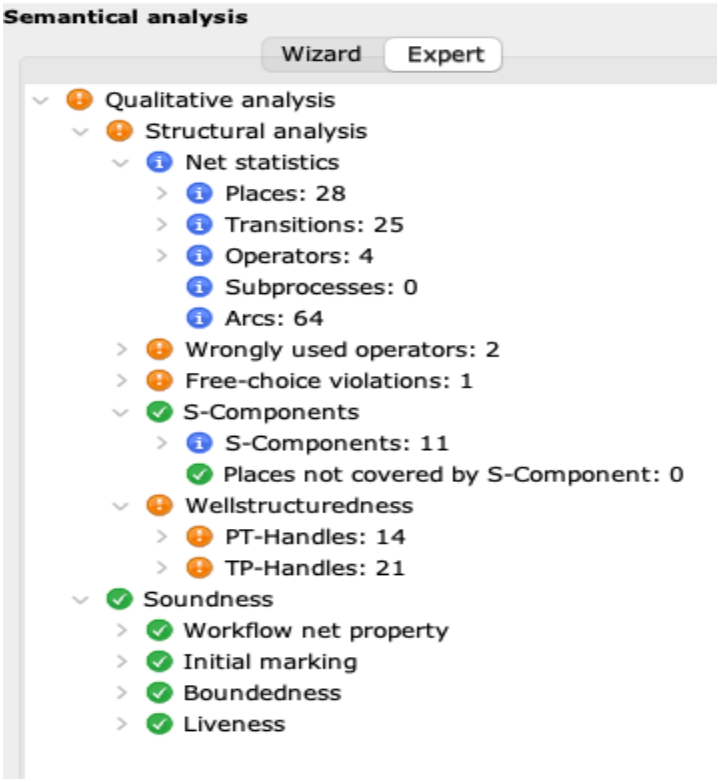
4. CONCLUSION

We can finally connect the previously examined workflow modules and form the combined net that corresponds to the collaboration diagram that was first built by adding spaces for the input and output. The process comes to end with the token at the end place p39.



The Combined Net is:

- an S-system
- has a Free-choice violation
- deadlock free
- all soundness requirements are satisfied
- it contains 14 PT-handles and 21 TP-handles
- S-covered by 11 S-components of different element sizes



In conclusion, the combined network appears to be sound, as evidenced by simulation of the token game on WoPed.