CONTRIBUTION TO DEVELOPMENT OF TELEMATIC SERVICES FOR DATA ANALYSIS IN TECHNOLOGY AREA. APPLICATION TO E-HEALTH FIELD.

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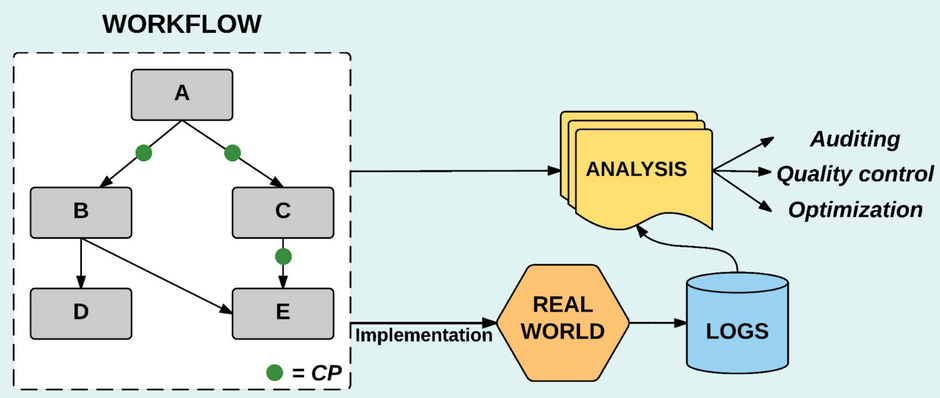
MOTIVATION

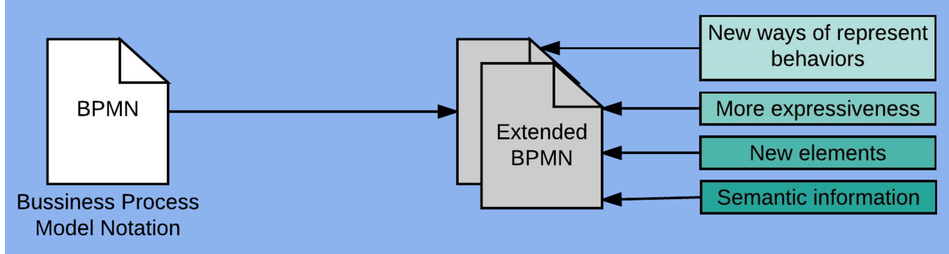
- In some contexts, such as the health domain, process monitoring is very important. It is necessary to control, check and verify the implementation of workflows in actual scenarios.
- Currently, ICT-based implementations and analysis techniques are gaining momentum providing a large set of advantages in auditing, quality control and optimization of procedures.
- Process Mining techniques are in continuous growing. It is a relatively young discipline and a lot of researches and futures lines are open. This PhD research tackles some shortcomings identified:
  - Some techniques are thought for workflows in which all the activities are monitorized. What happens with non-monitored activities?
  - Limited expressiveness of modeling languages. There is information that it is not represented in a machine interpretable format (therefore it can not be used in analysis).
  - It is necessary to improve the detection, prediction and recommendation of different behaviors.
  - Usability and understandability of these techniques are only reserved to experts.



THESIS OBJECTIVES

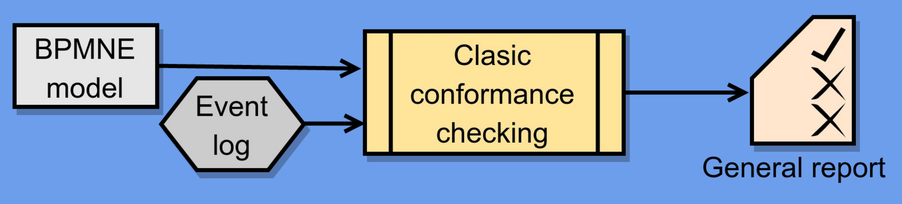
Modeling languages:

- Extension of current languages for improving its expressiveness.
- Current standards does not support the representation of many pieces of information provided in accompanying natural language documents.

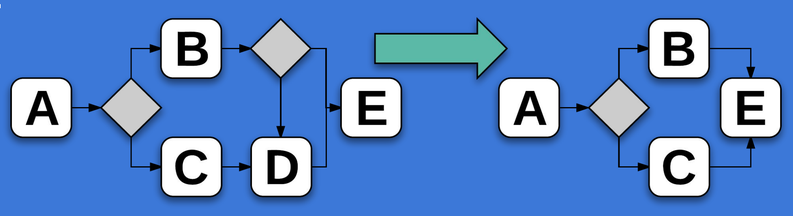


Improve current adherence to protocols techniques taking into account:

- Non-monitored activities.
- New semantic information provided by extended languages.

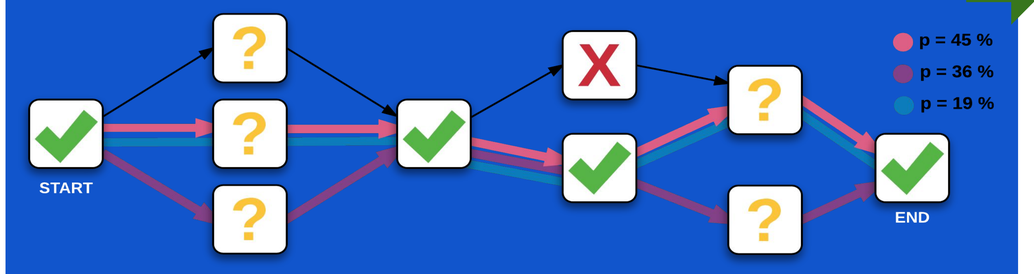


Protocol effectiveness (e.g. simplicity) and understandability for humans users.



About new types of analysis and results:

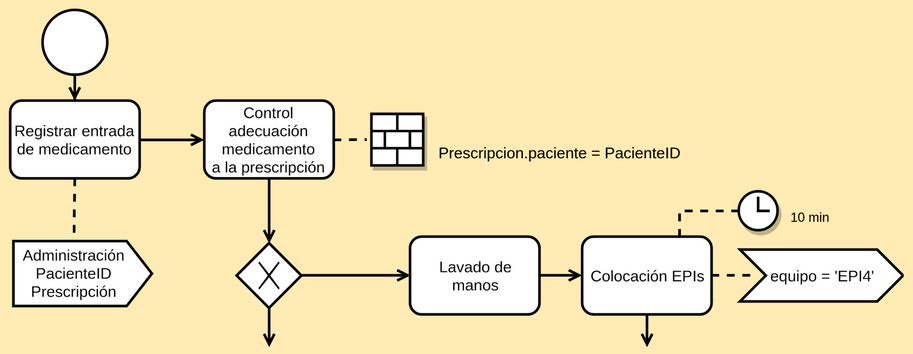
- Detection, recommendation and prediction of different behaviors.
- Analysis of "probability of taken paths" for non-monitored activities using semantic information about the context and state of products.



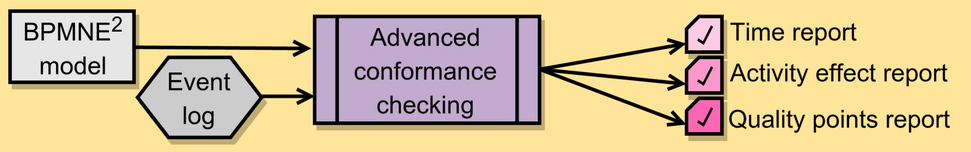
RESULTS & DISCUSSION

Contribution to three JCR articles ([2, 3, 4]) about the traceability process for process control using mobile devices and the safe handling of Hazarous Drugs.

During this last year the BPMN extension was significantly improved. The actualized proposal was published in a JCR journal [5]. A particularization for HACCP plans was discussed and presented in a conference [6]. A validation of the proposal inside a real context taking into account the experts in the field is under review in a JCR journal [7].

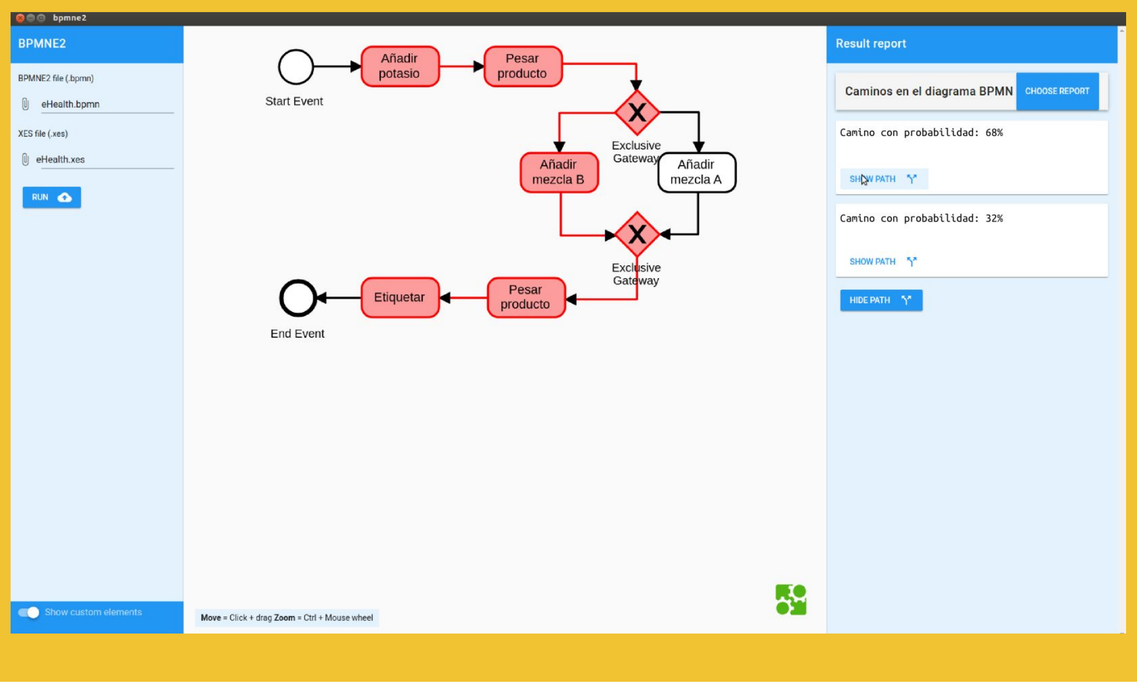


During this last year the advanced conformance checking techniques developed in previous years were refines, tested and validated. A research paper ([1]) gives a first point of view of theoretical perspective of different architectures, automatic tools and new models proposed. The objective now is to disseminate the new advances for its consideration to a JCR journal.

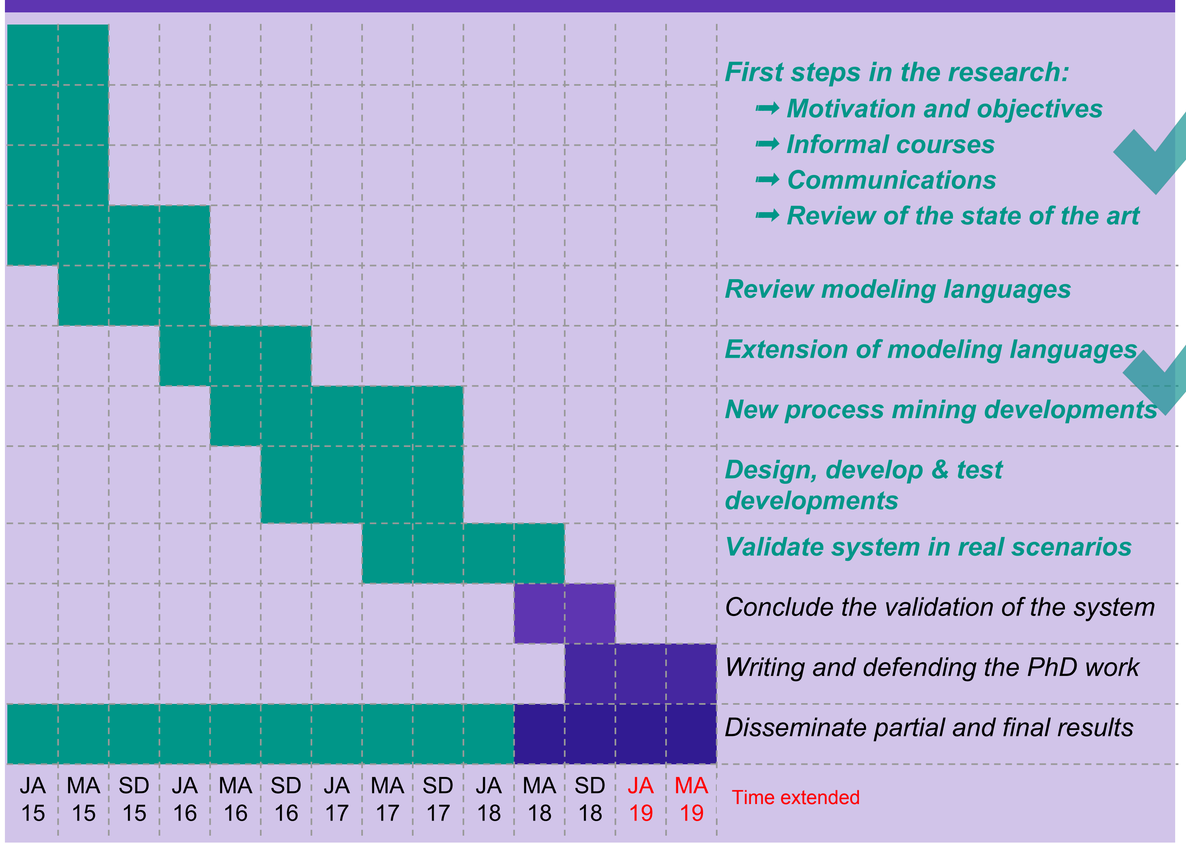


A pattern based method for simplifying a BPMN process model was developed in previous years. During this last year the algorithm was improved and tested with real world cases. An actualized research paper was sent to a JCR journal [8] (under review).

During this last year a prototype app for use the algorithm with a Graphic Interface was implemented. A paper will be submitted for its consideration to a JCR journal.



RESEARCH PLAN



NEXT YEAR PLANNING

- Close the tests in **real scenarios** (conducted in the frame of an eHealth project)
  - Elaborate conclusions about the validation of the models and algorithms proposed.
- Finish the dissemination of final results in international journals.
- Elaboration of final conclusions and writing and defending the PhD work.

REFERENCES

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