

Applying process mining to analyze business process management performance in the RPA environment

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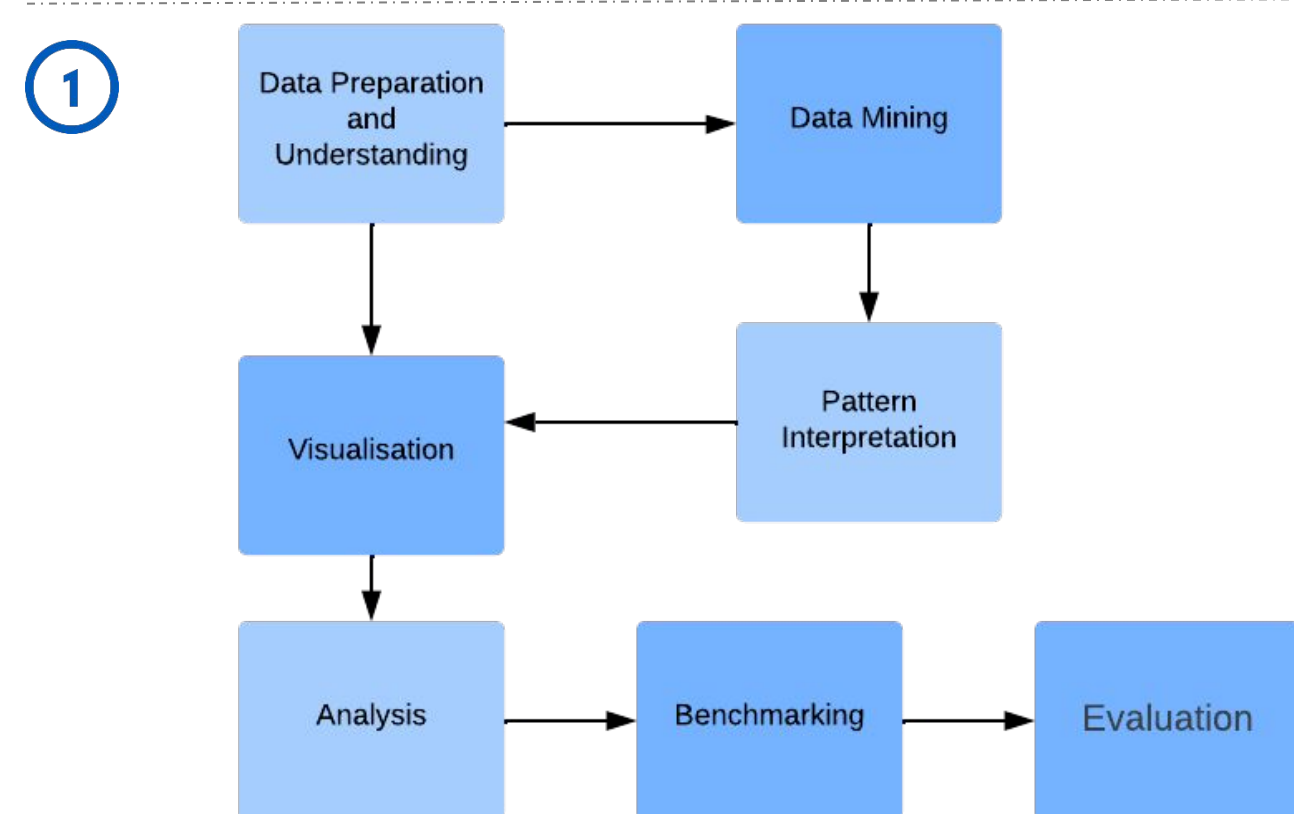
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Introduction

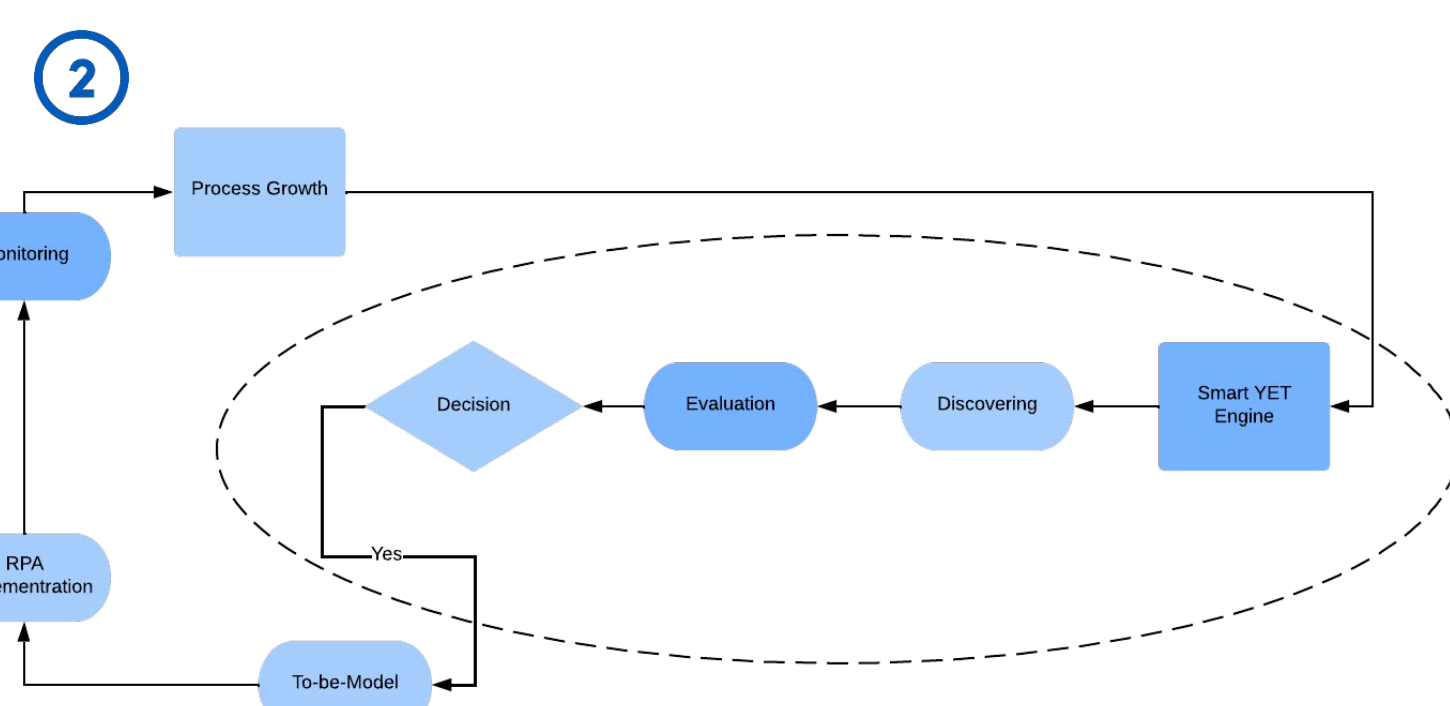
The objectives of this paper involve finding the answer for the research question which looks into applying process mining to analyze BPM performance in RPA systems by identifying the requirements of the investigation, extracting a conceptual design of the system, which considers both the structural and behavioral dynamic of the system, demonstrating the design, analyzing the results of the investigation, that reflects on the research made as well as its results.

Literature Review

Through this research, it is clear that there is a gap in the exploration of the assessment of process mining tools in which the research shows what different kinds of process mining tools can be used for various purposes but it does not detail how efficient that tool is compared to other tools that will fulfill the same purpose. This is because most tools used in the market are ones made by the organization itself. There is also limited recent information on process mining wherein most of the research is elementary and establishes the base of the topic. There was no shortage of information when it came to BPM contrary to when researching more on RPA. While there are some research papers investigating using process mining with RPA, there is little to none details about the process or how it is implemented given that only one of the research papers found detailed a step-by-step method of utilizing process mining to assess RPA. Additionally, because most of the papers mentioned investigated the topic before or after the COVID-19 pandemic wave hit without explicitly stating so, there is room to investigate more on the variations of each of the variables in question post and pre COVID pandemic. This would take into consideration how each variable is affected by unprecedented circumstances. With that being considered, there is a gap in testing the efficiency of process mining tools with how they are used to improve BPM strategies and how they are used with RPA.



To-be-Model of system



BPM model of the system

Methodology

The research question for this investigation is “to what extent will applying process mining to analyze business process management performance in the RPA environment be efficient?”. In order to investigate the question further, a design science-based methodology was used based on the objectives clarified in order to have a sound structural and behavioral design.

Design science involves five different activities that will be explored in depth in this paper:

1. Objectives: solution’s objectives are clarified
2. Requirements: non-functional and functional of conceptual design
3. Conceptual Model Design and development: design of system
4. Demonstration: implementation of system
5. Evaluation and Analysis: Analysis of results of demonstration

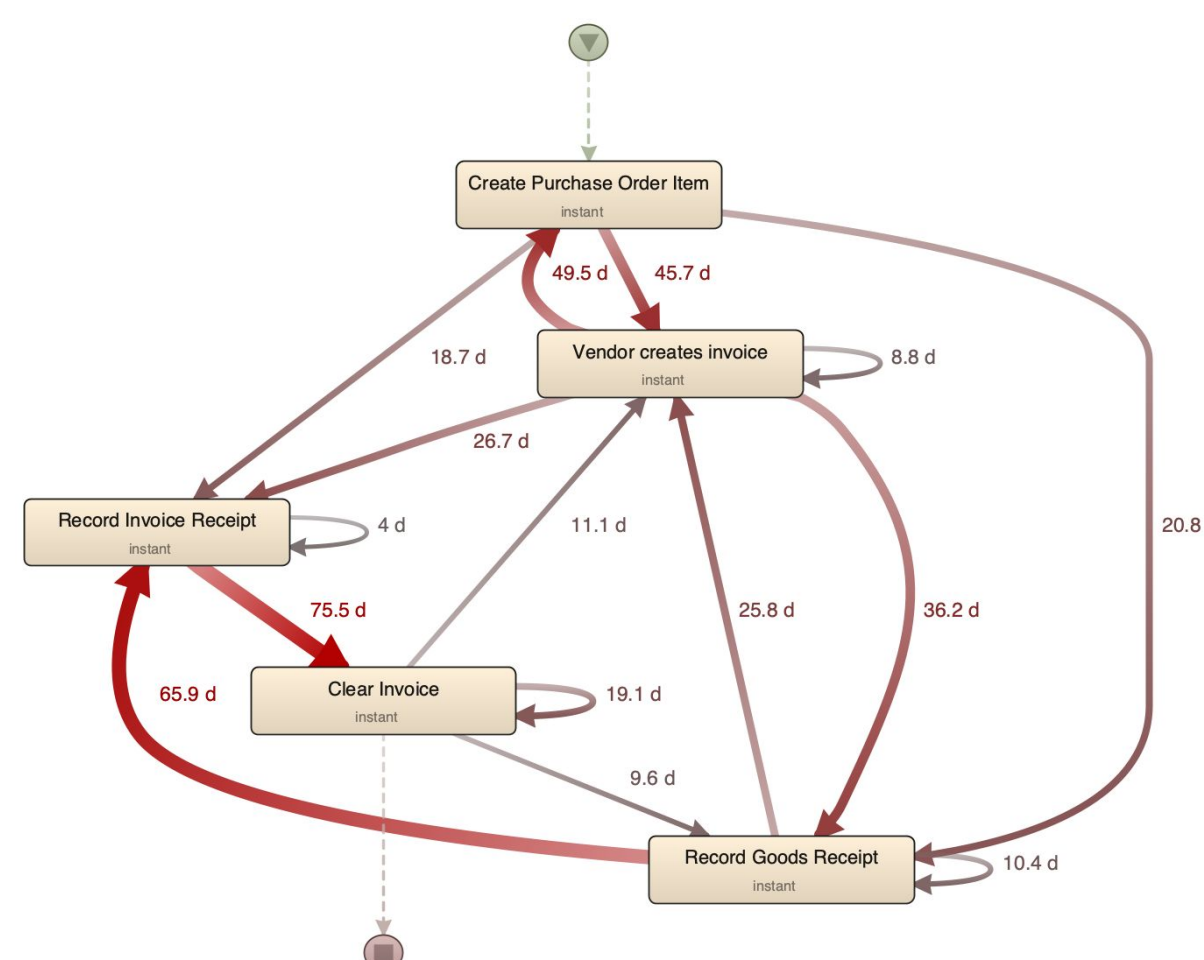
Another research methodology that was used was the BPM methodology which will be utilized in order to account for the behavioral design of the investigation. The BPM research methodology has four main sections:

1. Modeling: BPM model is designed
2. Enactment: test on model and improve real life cases
3. Analyzing: analyzing the model’s efficiency
4. Management: managing general sub-processes of the model

Results

Through the demonstrations and understanding more about the concept of the system’s structural integrity and design, looking into what the results of the investigation is made easier. The results of the investigation showed the different bottlenecks were emphasized when the uniform process map was booked into, and the shorter and longer running process maps were considered. The demonstration showed that the bottlenecks were not focused in a specific part of the process, meaning that the problem wasn't focused in a specific block but instead the entire process management system being utilized. Considering the questionable data quality of the event log, this is not absolutely surprising.

It is also important to consider the different conformance rules when reflecting on the performance of the process and where it stands as per the results of the process mining techniques run. These conformance rules include ordering, cardinality, exclusiveness, response, and precedence rules. It is likely that the amount of bottlenecks are as a result of violations in the rules previously mentioned, namingly the response rules, given the weight of the bottlenecks going from one process to the next after a certain process has elapsed.



Longer running tasks' process map (Disco)

Conclusion

Through finding this gap, two methodologies were adopted: the design science methodology and the BPM methodology in order to approach the research question set out to be investigated, which was, “to what extent will applying process mining to analyze business process management performance in the RPA environment be efficient?” Using these two methodologies for the model of the investigation to be made well considering both structural and behavioral design made the system have a more concrete model given it accounted for both of those aspects. Each of the methodologies’ respective steps will be followed step-by-step. Because of that, two different models were made: one model which was the process model of the system itself that focused on the structural aspects of the investigation and the other being a BPM cycle of the system if it were to be implemented.

By conducting this research and investigation, a complete conceptual design of the business was formed as well as an identification of the requirements they said conceptual design is required to follow, an in-depth analysis of the results with a concrete reflection on the research. The research contributes to literature by providing the concept of a design that encompasses RPA, BPM, and process mining in a singular system. It encompasses the relationships of each of the variables with each other in order to create a unique integration of them.

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