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Paper title: Add Data into Business Process Verification: Bridging the Gap between Theory and Practice
Source: Google scholar

The first part of the paper talks about how more understanding has been lately that when it comes to business process modeling (BPM) and artificial intelligence (AI), you really need to have a good way of looking at complex data objects too. It mentions some important details like:
In BPM, people have done lots of work on letting you put data into your models better than before.
This is partly because people in industry asked for these features.
Practical as well as theoretical advancements have led to incorporation of data modeling techniques into BPM. Some of the driving forces behind these advancements are research carried out in academic institutions as well as industry needs. Recently developed BPM suites can allow for model and data besides other features. Examples of such suites include Bizagi, Bonita, Camunda and YAWL.

It is aimed by this piece of work to find a way to make what happens with business computer programs easier to understand in general. Right now, there are tools that let people build models showing both how a program behaves and facts about its data; but if you want to be very sure these models are correct (or check that they do not contain certain kind of mistakes) you need special kinds of math which most commercial products do not support 100%.

Also, even though some scientists have come up with ideas related to that math, recently ones that tell us when we could use them & what sorts of problems, they'd help solve best there isn't anything yet where someone has said exactly what pieces would be most useful overall or described all details how such a thing might work etc.

RAW-SYS framework mentioned in this paper has two main parts:

Popular ways of formally saying what should happen with a process (control flow), how things being true or not true at diffe

1. rent times affects this (actions) and collecting facts about the world that might be needed (data models).
2. Something that tells you more about how any computer programs which follow your model can fit together with ones written with other people.

Every possible way that system could ever be (its 'state') is called snapshot. Sequences of these are used to describe what happens when something is running.
People looked carefully at lots of tools to see whether they let a person do all sorts of cool things both kinds of putting into programs afterwards checking have done right.

There are three levels of verification:

1. just control flow
2. control flow + conditions on arcs
3. control flow + what happens with data

Most current tools only go as far as level 1 or 2 analysis. As a result, they do not catch mistakes that would be visible from level 3.
To make it possible to decide certain things (instead of just giving up because we have too much to keep track of) we use the fact that there are only finitely many objects at any given time in a run but possibly infinitely many overall runs.
There are three different kinds of information in RAW-SYS that can be bounded: how big the global data store can get, how big local ones can get, and how many running cases there can be.

Reachability analysis means checking if there is some way of running the system so that some state matching a given criteria is reached. This problem is hard in general (not always solvable) when dealing with RAW-SYS because there might be infinitely many states in total.

It is proved that three types of reachability become unsolvable even if we change/limit modeling assumptions for RAW-SYS by showing how to reduce from an undecidable problem deciding whether programs ever finish execution (the "halting problem").
They implement the framework by translating RAW-SYS models and verification problems into C exploiting existing planners.

we discuss related work from literature along with its limitations and position RAW-SYS as bridging between foundational-practical; also, we give outline for future work direction.
By coming up with a framework that makes it possible to verify formally aspects of data in business process we aim to show ways in which gaps between academic research that driven by AI and what happens in BPM practice can be narrowed. We do not look at exact AI methods here, but we do recognize that one way to handle all the different possible values as well as complex relations would be by using something such as machine learning or other kinds of AI techniques