

RESEARCH ON UNDERSTANDABILITY ASSESSMENT OF BUSINESS PROCESS MODELS USING TEXT ANALYSIS SOFTWARE

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Business process models are increasingly used to represent the business operations of companies. Such models play an important role at the stage of identifying requirements for information systems to be created and during the analysis of business performance at the current moment. Many business process modeling initiatives have now grown significantly, involving many designers with varying backgrounds who have built and maintained hundreds of different models over time. One of the obstacles on the way to more effective use of these business process models is often insufficient quality assurance. It is necessary to determine how empirical research can improve the textual quality assurance of business process models. We also try to identify and exploit automated analysis techniques capable of maintaining quality assurance.

Conceptual modeling studies often distinguish between the syntax, semantics, and pragmatics of business process models with reference to semiotic theory. But any conceptual model must first be understood in terms of its syntax by a reader of the model before the semantics can be interpreted. The reader's understanding of a business process model should be seen as the central basis for analyzing its quality. An important direction for this research is to supplement the syntactic model analysis with an understanding of textual semantics and pragmatic aspects in the business process model. Therefore it is proposed to focus attention on the textual characteristics of the business process model [1].

Experiments and industry best practices suggest a preference for the “verb-object” style for text labels. This is one of the three general styles of naming activity elements. It defines an activity tag as a verb followed by a corresponding business object. Marking style is a factor whose indicators can only be nominally distinguished. This means that the input variable can be defined in binary, distinguishing between the use of the verb-object style and the use of another style [2].

The approach reported in one of the studies uses a variety of contextual information to match each label to its correct labeling style. When the marking style is known, tools such as WordNet can be used to find a verb corresponding to an action that has been formulated as a noun. This approach is proven to work accurately for several simulation collections [3].

There are already many different solutions in the world that try to automate the process of assessing the quality of business process models. Some of them are “BPMNspectator”, “Bizagi Modeler”, “Signavio”, “ARIS BPM”, “Camunda Modeler”, and “BPMN Quality Tool” [4]. However, none of them consider the clarity of text labels in business process models as a factor that affects the overall quality of these models.

With this in mind, let us introduce a degree that produces values in the range between 0 and 1, where 0 signalizes the very bad correspondence of business process activity labels to the “verb-object” labeling style and, therefore, the very bad comprehensibility. Whereas, 1 signalizes the very good correspondence of business process activity labels to the “verb-object” labeling style and, respectively, the very good comprehensibility.

Thus, the initial algorithmic solution, which can be proposed in this study, is the following:

1. Collect all elements of “task” type in a BPMN file.
2. Get text labels of all collected elements.
3. Split each text label into separate words.
4. Check if each first word is a verb with the help of NLP tools.
5. Check if rest of the words are nouns with the help of NLP tools.
6. Get the total correspondence to verb value for all first words.
7. Find the average correspondence value for the whole BPMN model.

Based on this algorithm, we designed and developed a software tool for end-users capable of processing business process models in the BPMN format and evaluating the quality of their text labels.

The basic usage scenario of software is the following: user submits a BPMN file and begins the process of evaluating the quality of business process model; when the process is complete, the system presents the evaluation results, and stores them in the database for further investigation. User interface of the implemented web-application can be seen in Fig. 1 together with result of a BPMN model quality evaluation.

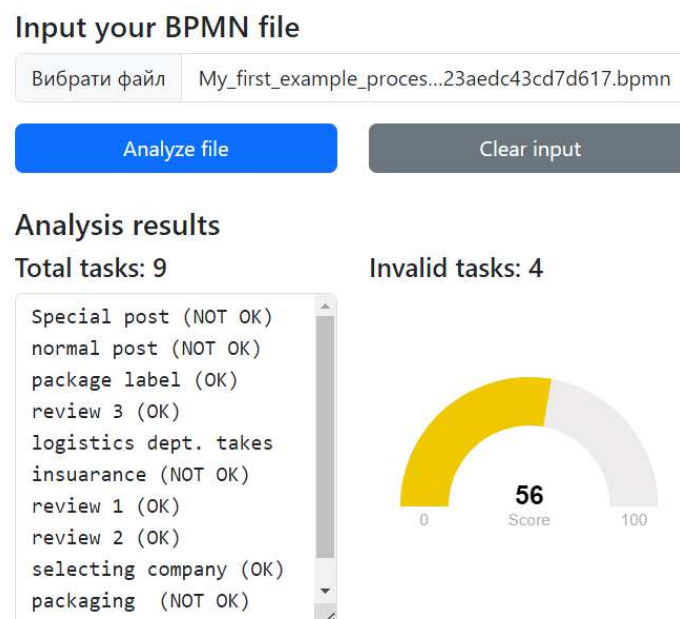


Fig. 1 – Developed software user interface

One direction of future research is how business model refactoring methods based on the resulting analysis can be defined in such a way that they do not depend on a rich set of natural language processing tools. In addition, it is still not clear how synonyms and homonyms problems in English can be automatically corrected.

References:

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