DEVELOPMENT AND RESEARCH OF SOFTWARE COMPONENTS FOR QUALITY ASSESSMENT OF BUSINESS PROCESS MODELS

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Small companies and large enterprises can use business process modelling as a key element of a Business Process Management strategy to map their operations into graphical diagrams that can then be used by business analysts to identify ways to improve organisational workflows.

It is assumed that business process models that violate the rules of business process modelling are incomprehensible and unsuitable for further work, which can lead to various errors at the stages of business process analysis, improvement and implementation of proposed modifications, i.e. during the development, testing and maintenance of various software components, information system components, etc. Therefore, this study investigated the structural measures of BPMN (Business Process Model and Notation) diagrams.

The existing software solutions for business processes modelling were analyzed, including ProcessMaker, Questetra BPM Suite, BizAgi Process Modeler, and Adonis.

The general design of the system architecture is proposed, and the database and software application were designed and implemented as the three-tier client-server web application based on Java, using the Oracle database.

Fig. 1 shows the home page of the developed software solution for assessing the quality of business process models. It shows a list of BPMN business process models evaluated for quality indicators against thresholds and error probabilities. The evaluated models were taken from the open BPMN model repository created by Camunda [1].

Name	Tasks	Start Ev.	End Ev.	OR-splits	Error Probability
Excercise_3_-_Subrogation_995343cb589c438e9e0edd816860d54f.bpmn	7	1	3	0	0.05
Exercise3_Regress_41a37ed15e824f5dafac82ffd71ea1de.bpmn	7	1	0	0	0.00
Exercise_3_-_Recourse_4fd5fffa728a4c5ab18cc6ae7a1cb95a.bpmn	7	1	4	0	0.05
Exercise_3_0266c9c0cf4c407bbcdbb3e4ff245102.bpmn	7	4	2	0	0.07
Exercise_3_f2ef3302a810413795d0fd9aa0f3d44c.bpmn	7	1	2	0	0.00
Exercise_3_Recourse_d6c211d232e248ed83cad2a0dcb1e19e.bpmn	8	1	3	0	0.05
Ex_3_906bd7c47cfb4257ac43aa297c2da4cf.bpmn	5	1	2	0	0.00
New_Process_e4405e688afa461a912b03281c13e44d.bpmn	5	1	1	0	0.00
Recourse_5ac35cacc88b43f9a0712c2b46ddbc07.bpmn	6	1	1	0	0.00
Recourse_642c92777f41437c8765ee142cb6964c.bpmn	3	1	2	0	0.00
Recourse_86d1ce1b0c73424c8edb8a136099b586.bpmn	4	1	3	0	0.05
Recourse_fb013b492cba4b8fb0fd38bdbcec65f5.bpmn	8	1	3	0	0.05
Recourse_Process_4ec053cbebfd4cb88665ee6916ae9ff9.bpmn	9	1	5	0	0.05
regressnahme_-_english_53f7c52ab6dd402a9f74f682293fb1cf.bpmn	5	1	4	0	0.05

Fig. 1. – Example of measured thresholds and error probability of BPMN models

BPMN business process models were evaluated in terms of quality indicators and compared to thresholds to calculate the probability of errors.

References:

1. BPMN for research, https://github.com/camunda/bpmn-for-research, 16.04.2025.