Illustrative Application Case Process

The case study of the research is an ITIL Change Management (CHM) ticketing process of the IT CHM department of a big enterprise with more than 200,000 employees worldwide. The following data were used in the scope of the present research for the process analysis, complexity measures and further evaluation of the results: unstructured ticket textual requests and ticket logs extracted from the IT ticketing system, official ITIL handbooks, and IT ticketing system manual.

ITIL provides a framework of best practice guidance for IT Service Management (ITSM). ITIL V3 contains detailed descriptions of 26 processes arranged as a Service Lifecycle into five main areas: Service Strategy, Service Design, Service Transition, Service Operation, and Continual Service Improvement. The case study process relates to Service Transition which objective is to build and deploy IT services. CHM deals with the processing of so-called Requests for Change (RfCs), tickets issued in order to add, modify or remove anything in the IT infrastructure that could affect IT services. RfCs can be issued for a variety of reasons, for example: proactively, to improve existing services or increase the ease of the latter, or reactively, as a response to resolve errors or incidents related to IT infrastructure. RfCs may also have characterized by, for example, different kinds, sizes of infrastructure components or configuration items (CIs) and their importance from the end-customer perspective.

To demonstrate the BP complexity, the need for its awareness creation, and practical value, we present a typical RfC processing scenario: (i) a customer request for a change (ticket) in IT infrastructure products or services reaches CHM workers; (ii) requested changes can be processed with various templates (pre-filled forms) existing in the system database. In case of a simple routine customer request, such as adding admin rights, these templates can be used one-to-one, and the IT ticket is processed within a few mouse clicks. In the case of non-routine and rather complex requests, two options are possible: (a) a pre-filled form from the database is used as a basis, and necessary fields are adjusted, and (b) an entirely new template is created; (iii) based on the information documented in a ticketing system, the IT ticket is implemented. We envision a BP complexity concept-based decision support to assist the ITIL CHM worker at this important step and reduce unnecessary work.

To illustrate this proposal, i.a., decision support by adequate use of automation, two application case processes are modeled – as-is and to-be – with the help of BPMN notation. The models are created from scratch based on the process descriptions from ITIL handbook and IT ticketing system manual, as there were no process models in the application case CHM department. The goal is to highlight the process improvement potential using the textual data based BP complexity. For a BPMN as-is model development, two pools, a customer unit and CHM department, are selected to depict the relation between process participants. The CHM department pool in its turn has four lanes, each one modeling the activities of groups with diverse roles and responsibilities (Fig. 1).

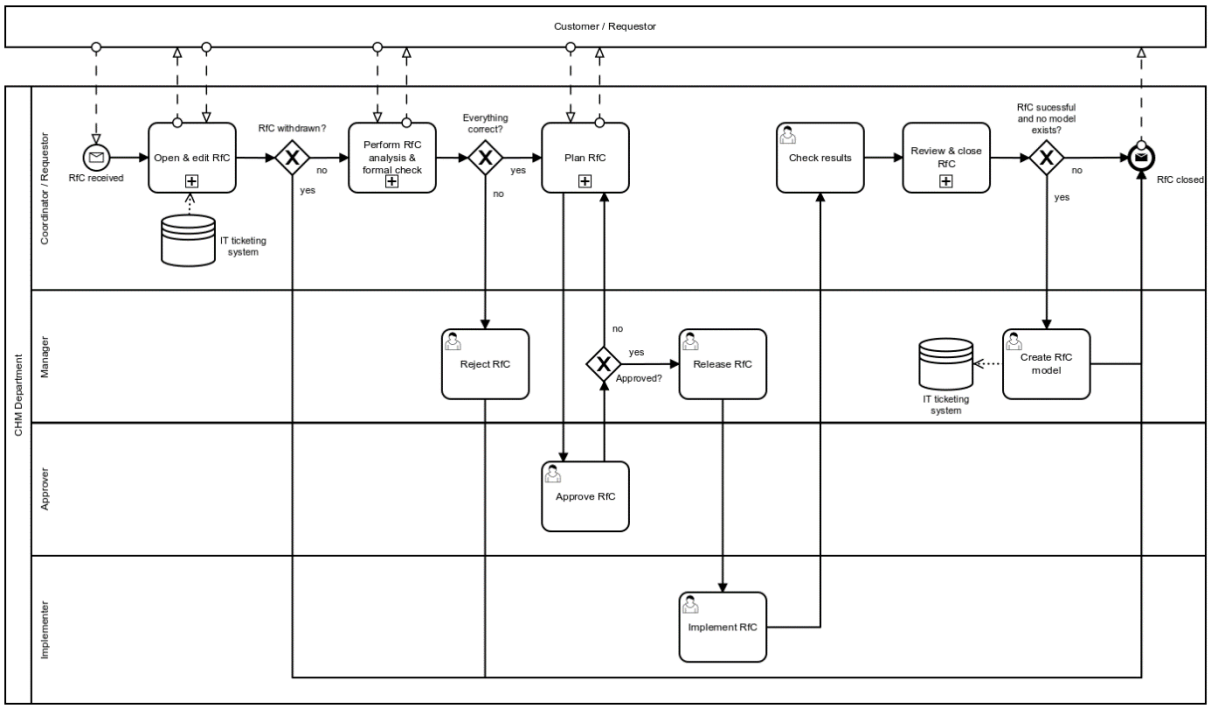

Fig. 1. As-is BPMN model of the ITIL CHM application case process

The to-be process model (Fig. 2) is used to show the process improvement enabled by the textual data based BP complexity concept. Here, business rule task "Predict RfC complexity" is implemented with a DMN decision table

(see Table 1) to predict the BP complexity and to demonstrate the practical value. Such an approach helps to identify the right type of processes for adequate technology-based (automation) decision support.

If one compares the as-is and to-be process models, it is obvious that the latter suggests significantly fewer interactions, process steps and process workers specifically for the processes with low complexity, which should reduce process muda[1], errors and processing time while increasing the efficiency. As one can see on Fig. 8, the mentioned business rule task "Predict RfC complexity" automatically extracts and aggregates the three knowledge aspects into the RfC complexity, this way enabling a partial automation of the process. Accordingly, the process flow for RfCs with *low* complexity is completely automated with the one-to-one pre-approved templates, directly leading to the activity "Release RfC". In the as-is process, this activity is an exclusive task of the manager and has to be always performed after "Plan RfC" and "Approve RfC" activities for every RfC. For the RfCs of *medium* and *high* complexity, another level of support is envisioned. A BP worker receives a so-called next best action template whereby he/she needs to make the right choice from the options available in a form of drop-down list. Afterwards, the activity "Plan RfC" takes place including other activities in a sub-process, such as "Approve RfC". This happens in case when BP worker was unsure which drop-down list option (pre-approved or unapproved) from the template to take. This decision can be influenced by many context specific factors, for example experience, professionalism, stress. In case of high complex RfCs, the suggested support is minimal, i.e., history of similar RfCs. Here, the process flow remains equal to the as-is process model, whereby all activities are summarized as a sub-process "Plan RfC".

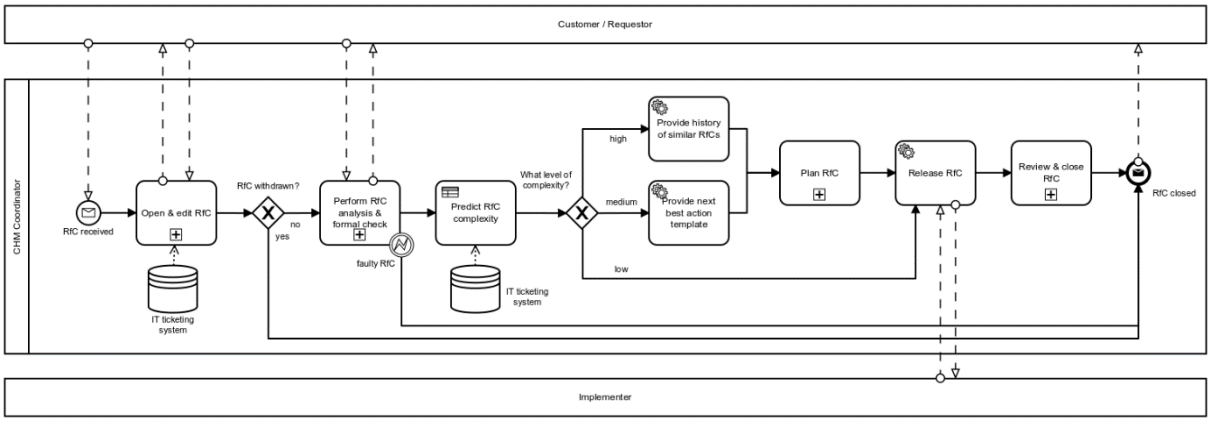

Fig. 2. To-be BPMN model of the ITIL CHM application case process

Table 1. DMN decision table "Predict RfC complexity"

F	Input			Output
	DML level	PAE	Readability	RfC complexity
	enumeration	enumeration	enumeration	enumeration
1	routine	low, medium	effortless, involving effort	low
2	semi-cognitive	low	effortless	low
3	routine	-	telegraphic	low
4	routine	high	effortless, involving effort	medium
5	cognitive	low	effortless	medium
6	semi-cognitive, cognitive	low	involving effort	medium
7	semi-cognitive, cognitive	medium, high	effortless	medium
8	semi-cognitive	-	telegraphic	medium
9	semi-cognitive, cognitive	medium, high	involving effort	high
10	cognitive	-	telegraphic	high

[1] - muda is a Japanese word meaning "uselessness, wastefulness" used in lean process thinking, https://www.lean.org/lexicon/waste