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## The Knowledge Work Designer - Modelling Process Logic and Business Logic

Knut Hinkelmann<sup>1</sup>, Arianna Pierfranceschi<sup>2</sup>, Emanuele Laurenzi<sup>3</sup>

**Abstract:** The Knowledge Work Designer is a tool that implements a modelling method for knowledge work. It is based on two principles: (1) the separation of business logic and process logic and (2) the support of both structured and unstructured knowledge. Process logic can be represented in a structured way in BPMN and in a non-structured way with CMMN. For deep integration of business processes and case a new model type is offered. Business logic can be represented in a structured way using decision tables. Unstructured business logic can be represented in documents.

**Keywords:** modelling method, process model, case management, decision modeling, knowledge work, process logic, business logic

### 1 Introduction

The Knowledge Work Designer is a tool that implements a modeling method, which supports processes that involve knowledge work. It is based on the following two principles, which allow to cover a broad spectrum of knowledge work: (1) modelling process logic and business logic and (2) support of knowledge work with different degrees of structure.

In a business process one can distinguish between process logic and business logic.

- Process logic is the knowledge *about* the process, in particular the process flow with events and activities, the involved participants and resources. The process logic is typically represented in a business process diagram.
- The business logic is the knowledge *in* the process. It corresponds to the practice aspect of Davenport (2010) and is about how the work is actually done. Understanding business logic means to understand how individual workers or applications respond to the real world of work and accomplish their assigned tasks.

Both process logic and business logic should be considered equally important. The

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<sup>1</sup>FHNW University of Applied Sciences and Arts Northwestern Switzerland, School of Business, Riggbachstrasse 16, CH-4600 Olten, knut.hinkelmann@fhnw.ch

<sup>2</sup>FHNW University of Applied Sciences and Arts Northwestern Switzerland, School of Business, Riggbachstrasse 16, CH-4600 Olten, arianna.pierfranceschi@gmail.com

<sup>3</sup>FHNW University of Applied Sciences and Arts Northwestern Switzerland, School of Business, Riggbachstrasse 16, CH-4600 Olten, emanuele.laurenzi@fhnw.ch

balance between process logic and business logic is an important consideration for anyone attempting to address knowledge work Davenport (2010).

About 60% of a knowledge worker's day is spent in un-structured and often unpredictable work patterns, only about 40% is structured, predictable and automatable (Palmer 2011). Gadatsch (2012, p.43) distinguishes three types of processes with respect to their degree of structure: structured processes, cases and ad hoc processes. While adhoc processes cannot be modelled at all, there are modelling languages for structured processes and cases:

- For structured processes, the activities and the conditions for their execution are known in advance. The Knowledge Work Designer uses the Business Process Model and Notation BPMN 2.0 (OMG 2011) to model structured business processes.
- Case processes contain both structured and ad-hoc parts. Human judgment and external events determine how to proceed (McCauley 2010). Case Management has been proposed as an alternative approach for the management of case processes (Palmer 2011). The Case Management Model and Notation (CMMN) is a modelling language specific for case management (OMG 2014).

The distinction between different degrees of structure is not only relevant for process logic, but also for business logic.

- Business rules can be represented in natural language or in a semi-structured form like the SBVR Structured English Notation (OMG 2008 Annex C).
- Decision making often is based on a fixed number of decision criteria which can be represented in a structured way using decision tables, which are part of the Decision Model and Notation DMN (OMG 2015).

## 2 Relevance of Knowledge Work Designer for the Community

The Knowledge Work Designer contributes to the community with respect to three aspects:

1. it supports the balance between process logic and business logic by providing model types for both. This allows to model decision-aware business processes, which "distinguish between tasks that perform work (i.e., process tasks) and tasks that come to conclusions based on business logic (i.e., decision tasks)" (von Halle & Goldberg 2010, p.66).
2. it supports the different structure degree of process logic (i.e. structured processes and case processes) by providing a new model type called BPCM (Business Process and Case Management Notation).
3. it supports the different structure degree of business logic by providing a document model type and a DMN model type respectively.

### 3 Model Types of the Knowledge Work Designer

The Knowledge Work Designer tool is available in the following link: <http://knut.hinkelmann.ch/download/kwd.zip>. It has been implemented in ADOxx (<http://www.adoxx.org>) and uses the information retrieval, model analysis and simulation features of ADOxx. Figure 1 shows the user interface of the modelling tool with a BPMN sample process.

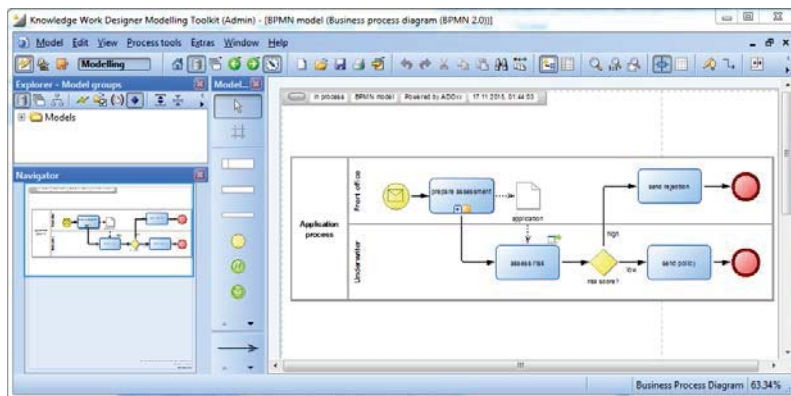


Figure 1. Screenshot of a business process model in the Knowledge Work Designer

Figure 2 shows an example of a case management model in the Knowledge Work Designer tool. The diamonds on the boundaries of tasks are called Sentries. Sentries define the criteria according to which the plan items are enabled and terminated.

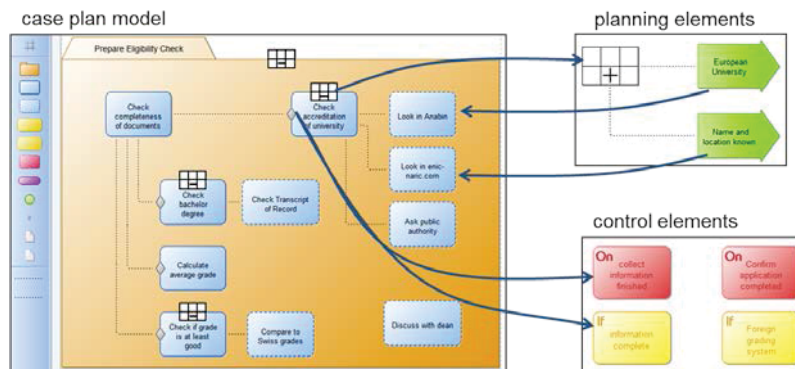


Figure 2. A sample case plan model with references to control and planning elements

A sentry is a combination of an event and/or a condition. An On-Part specifies the event that serves as a trigger. The If-Part specifies a condition that evaluates over the Case File. In order to enable reuse, conditions and events of sentries are modelled in a separate model type - the control elements model (see at the lower right-hand corner of

Figure 2). Furthermore, the case worker is supported in his/her planning by applicability rules. The applicability rules are modelled in a separate model to enable reuse for different discretionary tasks.

While case management is often considered as different from conventional business process management (Palmer 2011), in reality they cannot be strictly separated. The BPCMN model type deeply integrates modelling of structured processes and cases (Figure 3). Flexibility of process execution is represented by the discretionary tasks, whose execution depends on the judgment of the individual worker. Furthermore, it is possible to add tasks, which are not part of the sequence flow and thus can be executed as soon as their sentry evaluates to true.

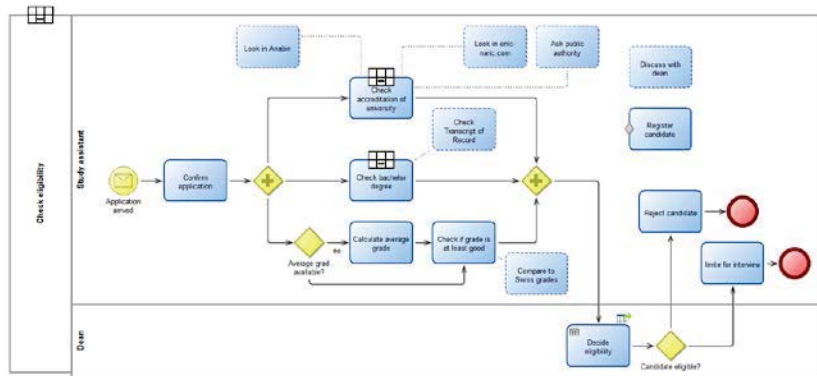


Figure 3. A BPCMN model with control flow and discretionary tasks

To model decision logic, our tool supports the Decision Model and Notation (DMN) from the OMG (2015). The left part of Figure 4 shows a Decision Requirements Diagram consisting of four elements: Decision, Business Knowledge, Knowledge Source and Input Data.

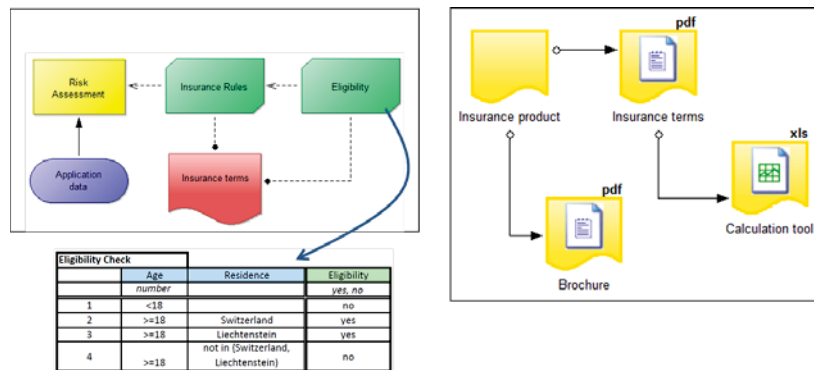


Figure 4. Decision model and document model for representing business logic

The decision rules can be represented in many different ways. A decision table is a formal representation, which can be interpreted by humans and can be translated into code for a rule engine. The document model can be used to represent non-structured business logic, knowledge sources and documents of a case file. To represent decision-aware business processes (von Halle & Goldberg 2010, p.66ff), the Knowledge Work Designer tool supports referencing of decisions and documents from tasks (see Figure 5).

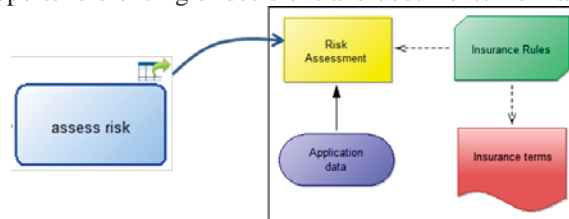


Figure 5. Referencing decisions from process tasks

To develop the Knowledge Work Designer modelling method we analysed a concrete case - the admission process of FHNW - from which we derived requirements, in particular for the combination of CMMN and BPMN. For evaluation purposes, the method was then applied to the same scenario as can be seen in the screenshots.

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