

# SBVRwiki (Tool Presentation)\*

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**Abstract.** SBVR is a mature standard for capturing expressive business rules along with their semantics, and is especially useful in the communication with business people. SBVRwiki is a novel tool that allows for an effective use of the SBVR notation. This online collaborative solution allows for distributed and incremental rule authoring for business analytics and users. It supports creation of vocabularies, terms and rules in a transparent, user-friendly fashion. The tool provides visualization and evaluation mechanisms for created rules, and besides basic syntax highlighting and checking, it allows for logical analysis. As it is integrated with the Loki knowledge engineering platform, it allows for on-the-fly conversion of the SBVR rule base and vocabularies to Prolog. The Dokuwiki back-end provides storage and unlimited version control, as well as user authentication.

## 1 Introduction and Motivation

SBVR (Semantics of Business Vocabulary and Business Rules) [7] is a standard for capturing expressive business rules, commonly perceived as a useful tool in the communication between business analytics and business people. The set of vocabularies and rules described with the use of SBVR can be an important part of requirements specification from the software engineering methodologies.

An effective use of the SBVR notation is non trivial, because it requires certain knowledge engineering skills. Thus, there is a need for software supporting business analytics in the rule acquisition process. Such software should allow for syntax checking, automatic hinting as well as preliminary evaluation of the resulting set of rules.

There are several SBVR-supporting tools like editors that support text-based creation of dictionaries and business rules providing syntax highlighting and suggestions; modelers that allow for generating models based on SBVR compliant documents; or tools that allow a user to import various models and transform them into the SBVR syntax. Considering their limitations of the existing tools supporting SBVR authoring, our motivation is to deliver a lightweight tool allowing for easy creation of the SBVR knowledge bases even for inexperienced users. We opt for a web-based solution that allows business users and analytics to collaborate using a familiar browser-based interface.

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SBVRwiki uses the Dokuwiki<sup>1</sup> back-end for storage, unlimited version control and user authentication. The tool supports identification and creation of vocabularies, terms and rules in a transparent, user friendly fashion. It also provides visualization and evaluation mechanisms for created rules.

Our tool is integrated with the Loki knowledge engineering platform [5,4], which is based on DokuWiki as well. This allows for on-the-fly conversion of the SBVR rule base and vocabularies to Prolog. Use of the Prolog-based representation also opens up possibilities of formalized analysis of SBVR rules.

The rest of the paper is structured as follows. Section 2 discusses the functional requirements for the wiki-based collaborative platform for knowledge engineering, especially for requirements analysis. Then, in Section 3 the SBVRwiki system is presented. Future work is summarized in the final Section 4.

## 2 Functional Requirements

Wikis are broadly used in various areas including distributed requirements analysis [2,3]. They are chosen as they are easy to use, provide an efficient way for collaboration within a large group of people and their maintenance is almost costless. The drawbacks of using the Wiki systems in design process are lack of automatic analysis and conflicts detection as well as unstructured text in which documentation is written. Moreover, users can write requirements in the forms that are suitable for them. Thus, others can misinterpret the idea and this can result in useless time-consuming debates. The tool presented in this paper addresses both indicated issues. It combines simplicity of use with the SBVR standard that enforces structured specification.

Main functional requirements for an SBVR wiki-based system are as follows: 1) creation of a new SBVR project composed of vocabularies, facts, and rules using a set of predefined templates, 2) authoring of a project using structured vocabularies, with identified categories, 3) SBVR syntax verification and highlighting in text documents, as well as syntax hinting, 4) visualization of vocabularies and rules as UML class diagrams to boost the transparency of the knowledge base, 5) file export in the form of SBVR XMI, 6) integration with the existing PlWiki and BPWiki [6] platforms, 7) full support for the SBVR syntax, including at least binary facts, 8) constant assistance during the editing of the SBVR statements, including elimination of common errors, the use of undefined concepts, duplicated entries, etc. Using these requirements, a prototype implementation called SBVRwiki was developed [8].

## 3 System Presentation

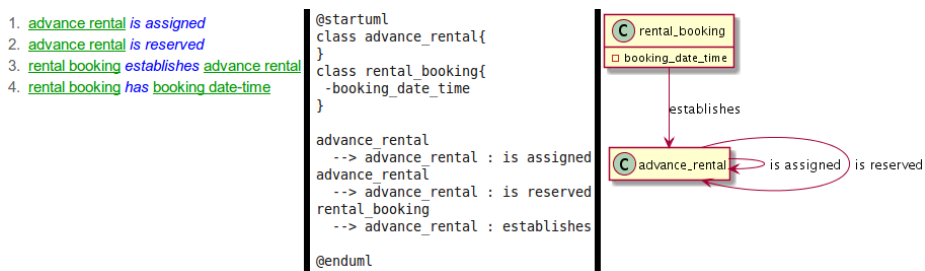
The development of the SBVR wiki was based on several implementation requirements, such as: the system should be an extension (plugin) to the DokuWiki platform by extending the capabilities of the native Dokuwiki editor; it should operate in parallel with the PlWiki and BPWiki extensions, and should not interfere with the operation of other add-ons installed on the platform.

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<sup>1</sup> A lightweight and open-source wiki engine, see: [www.dokuwiki.org](http://www.dokuwiki.org).

Dokuwiki offers several classes of plugins allowing for fine-grained processing of the wiki text. SBVRwiki implements two main plugin components:

- SBVRwiki Action Plugin – responsible for the file export in the XMI (XML) format. It also handles the user interface events and extends the built-in Dokuwiki editor with shortcuts for common SBVR constructs.
- SBVRwiki Syntax Plugin – used to enter SBVR expressions as wiki text using a special `<sbvr>` wiki markup. Using it a user can enter legal SBVR expressions and the plugin offers rich syntax highlighting. Moreover, vocabularies can be visualized with the dynamic translation to UML class diagrams that are rendered by the wiki using the PlantUML tool<sup>2</sup>, see Fig. 1.



**Fig. 1.** Class diagram generation with PlantUML (from left: fragment of the fact dictionary; a text file to generate the class diagram; and UML class diagram generated by the PlantUML tool)

There are several advantages of using a Wiki system as the implementation platform. As the SBVR expressions can be stored in separate wiki pages, the content can be simultaneously edited by a number of users. The Loki engine can select only the relevant parts of this knowledge on the fly, so the pages can contain not only the SBVR content, but also additional pieces of information, such as comments, figures, media attachments, and hypertext links to other resources in the wiki or on the Web.

For this tool presentation, we use a benchmark case of SBVR knowledge base, the classic EU Rent case<sup>3</sup>, provided as a part of the SBVR specification [7].

EU-Rent is a fictional international car rental company. Renters may be individuals or accredited members of corporate customers (a company or similar organization). In each country, EU-Rent offers broadly the same kinds of cars, ranging from "economy" to "premium" although the mix of car models varies between countries. Rental prices also vary from country to country. However, different models of offered cars are organized into groups, and all cars in a group are charged at the same rates within a country.

<sup>2</sup> See: [plantuml.sf.net](http://plantuml.sf.net).

<sup>3</sup> You can browse the EU-Rent case using wiki on: <http://home.agh.edu.pl/~kkutt/sbvrwiki-demo/>. Credentials: demo/demo.

A car rental is a contract between EU-Rent and a renter, who is responsible for payment for the rental and any other costs associated with the rental (except those covered by insurance). A rental booking specifies: the car group required; the start and end dates/times of the rental; the EU-Rent branch from which the rental is to start.

During creating a new SBVR project, several steps have to be taken. However, this does not require much knowledge of the application because a user is supported by a set of built-in guiding wizards. Using SBVRwiki, a user should define concepts first, then writes down facts, and finally rules can be authored. Concepts, facts and rules are stored in the separate Wiki namespaces. The Lexer module of the plugin detects the previously defined tokens what allows for proper syntax highlighting as well as for detecting the use of undefined concepts.

In the case of the EU-Rent example, a user can start from creating a dictionary. It is a set of terms grouped in categories. If a user wants to describe concepts such as *additional driver* or *loyalty club*, it is a possibility to write down the information about these terms, such as a source, a type or a definition. A user can also group them in category *Customers*. Finally, dictionary is saved and clearly formatted wiki page can be displayed (see Fig. 2).

The next step consists in creating the base of facts. A user can specify what dependencies exist between previously defined concepts. E.g. it can be specified that *loyalty club* includes *club member*, *renter* is *club member*, and *renter* is *additional driver*. When all such facts are described and saved, simple UML graphs are generated to visualize created database (see Fig. 3). In the last step, a user specifies rules providing constraints for modeled system. When saved, they are also clearly formatted and visualized in simple graphs form (see Fig. 4).

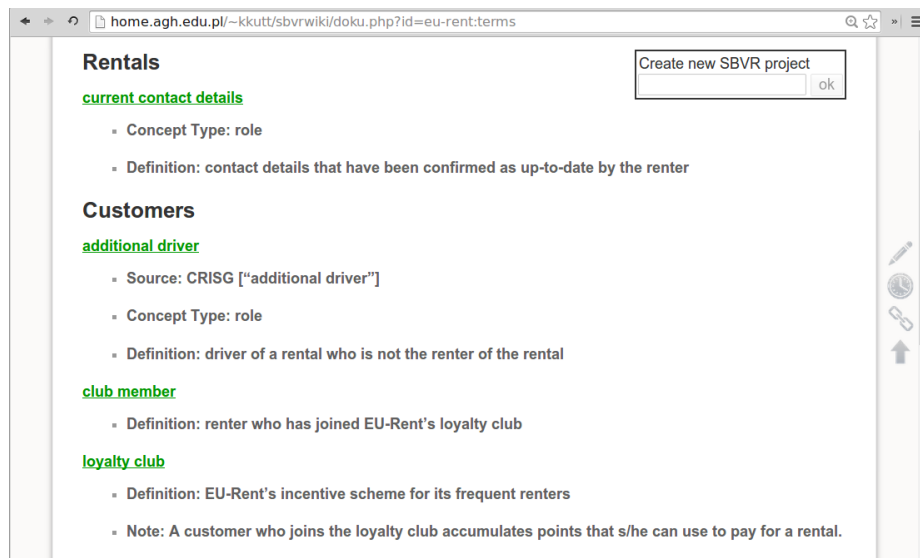


Fig. 2. EU Rent Terms Dictionary

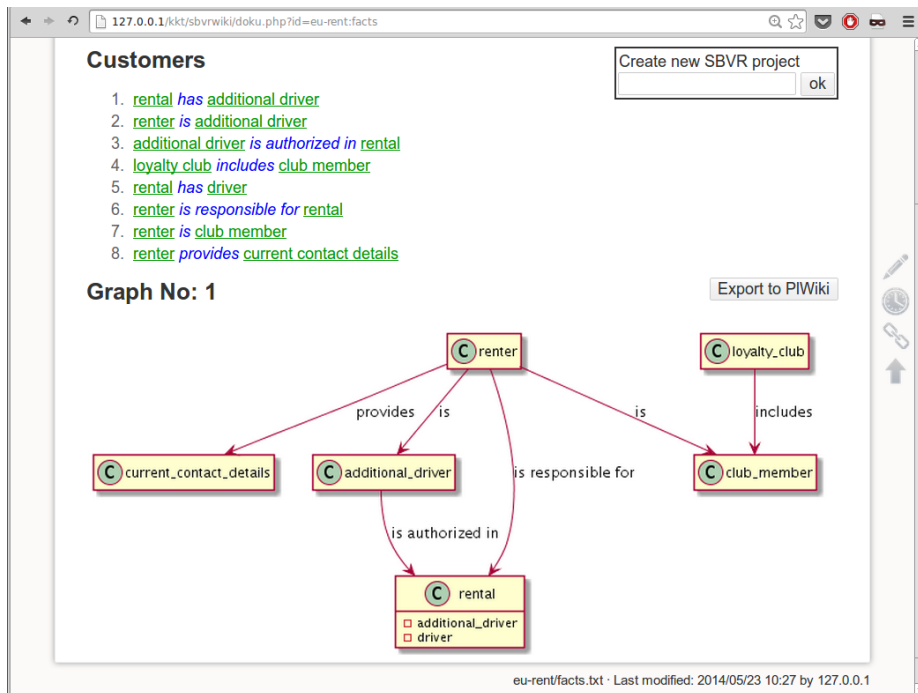


Fig. 3. EU Rent Facts Visualization

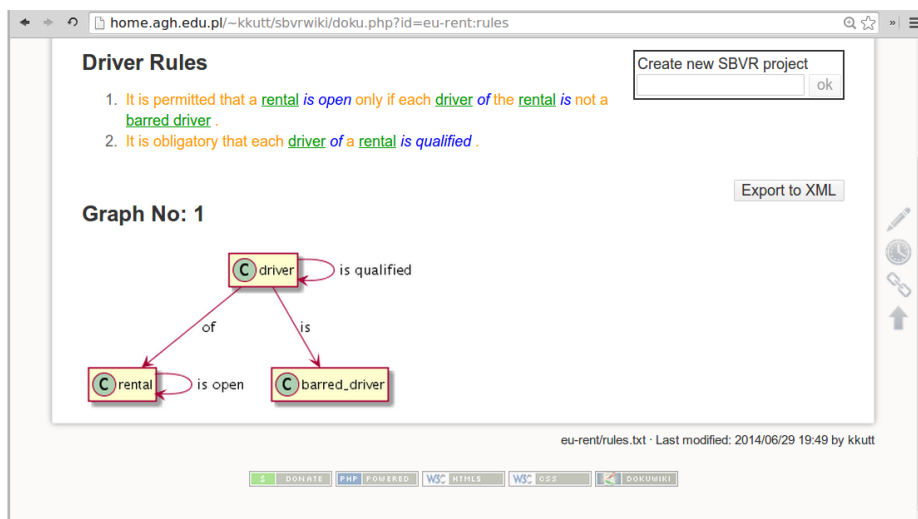


Fig. 4. EU Rent Rules Visualization

## 4 Future Work

Although the current version of SBVRwiki does not support all aspects of the SBVR standard, it implements enough of its elements to allow users to create complex models of business rules in Structured English. Its limitations are the lack of support for multi-argument facts, polymorphism or additional attributes for the expressions, dictionaries, facts and rules.

As the tool is implemented as a plugin for the DokuWiki system, it can be integrated with the BPWiki plugin [6]. This would allow for specification of systems including both business processes and rules. Moreover, the use of the Prolog-based representation in Loki opens up possibilities of formalized analysis of the SBVR rules. In future, the tool can be also extended to use the rule engine integrated with DokuWiki [1] for reasoning capabilities.

SBVRwiki has been recently used in the Prosecco<sup>4</sup> research project as a tool for authoring the SBVR rules. One of the objectives of the project is the development of a system supporting management of SMEs (Small and Medium Enterprises) using business process and rules with well defined semantics. Thus, the tool was used to model vocabularies and rules identified in the SMEs participating in the project.

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<sup>4</sup> See: <http://prosecco.agh.edu.pl>.