

# ITEMBUILDER NEW RELEASE

2015 / Spring

## CBA ITEMBUILDER RELEASE VERSION 6.0.1 / 6.0.2

Updated Functionality:

- Finite State Machine (FSM) Debug Viewer
- Visual Feedback for Drag and Drop
- Highlighting Browser-Support
- Multiple Result Variables in Units

**TBA** Technology Based Assessment  
Ein Arbeitsbereich des DIPF

Welcome to the second CBA ItemBuilder newsletter! With version 6.0.1 and 6.0.2 we provide upgrades concerning the functionality of the CBA ItemBuilder, summarized in this newsletter. The update is available at no costs for scientific purposes. Please e-mail to [tba-info@dipf.de](mailto:tba-info@dipf.de) to gain access to the latest version.

## NEW FEATURES OF CBA ITEMBUILDER

### Finite State Machine (FSM) Debug Viewer

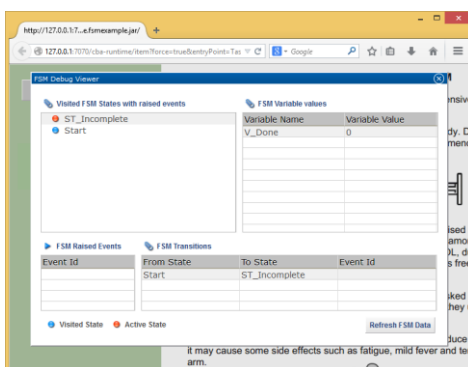
The newly developed tool for CBA ItemBuilder is a major improvement for working with the Finite State Machine (FSM), the “working horse” for enabling interactivity in computer-based items. It allows monitoring the FSM while previewing the project in the browser. At any time the item developer can press the hotkey (<Ctrl> + M) to open a dialog that gives detailed information about visited states, FSM variables and their values, FSM events and FSM transitions. This feature is expected to help advanced users to find possibilities to improve implemented items as well as help new users of CBA ItemBuilder to learn about the FSM and to check their own understanding of the concept.

### Visual Feedback for Drag and Drop

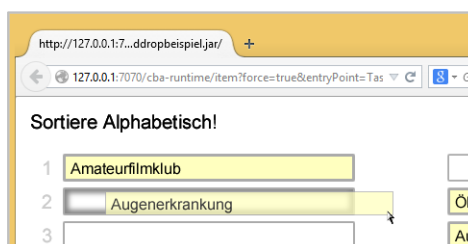
Drag and Drop operations are implemented in CBA ItemBuilder with the help of the FSM along with so-called TextValueDisplays, ImageValueDisplays or IconValueDisplays. In the new version this implementation was completed by adding visual feedback when dragging objects: the dragged object is displayed while dragging and a potential drop area is highlighted. This feature is expected to improve the usability of drag and drop items.

### TextFields with Highlighting

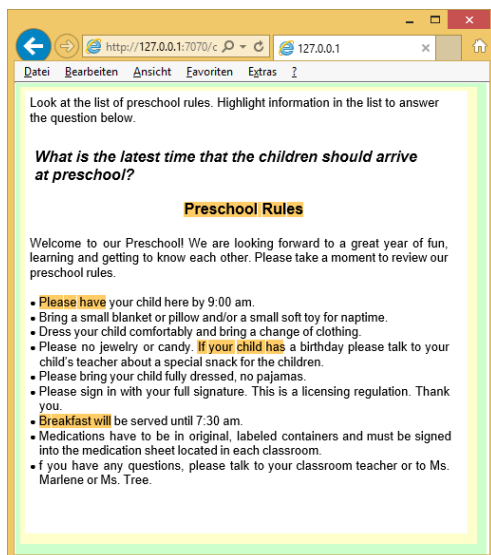
One of the strong features of the CBA ItemBuilder is highlighting of text as a way to give a response. With the latest release the underlying TextField-element was improved. It is no longer restricted for deployments with Firefox Browsers only. Instead, the TextFields providing, for instance, the highlighting-functionality can now be used in several browsers (e.g. Google Chrome => 40 and Microsoft Internet Explorer => 11).



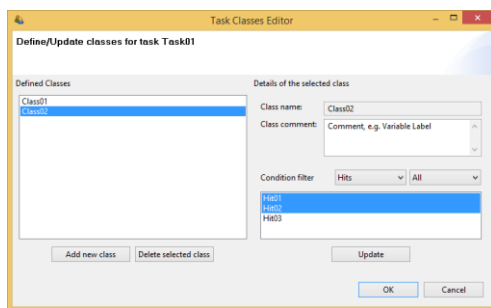
Screenshot 1: FSM Debug Viewer newly developed in version 6.0.1 of the CBA-ItemBuilder.



Screenshot 2: Visual feedback for drag and drop published in version 6.0.2 of the CBA-ItemBuilder



Screenshot 3: Highlighting (see example from the PIAAC study) using TextFields is running in the Internet Explorer Version 11 and above.



Screenshot 4: Task Class Editor developed to manage multiple result variables in tasks for items with unit structure developed in CBA ItemBuilder 6.0.2

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## Multiple Result Variables to Support Unit-Structure

For the implementation of items with unit structure the CBA ItemBuilder was extended to provide multiple result variables for each task. For this purpose “classes” can be defined with a class name (variable name) and a comment (variable label). Each hit or miss condition (taking the rule of the value of a categorical result variable) is assigned to a particular class (i.e., a particular result variable). For large units, a new “Task Classes Editor” was added to the CBA ItemBuilder to manage the assignment of classes to either hits or misses. Note, each class can either be used for hit or miss conditions.

## MINOR IMPROVEMENTS AND SOLVED ISSUES

In addition to the updated features, minor improvements were added to version 6.0.1 and 6.0.2:

- All components having a UserDefinedID are assigned to a unique and stable user defined id by default. This ID is not modified by subsequent item generation steps and can be traced back in log events. Manual defined id always have priority.
- Two new events: Events for the Finite State Machine (FSM) can be assigned to TextFields (raised each time the text highlighting status changes) and to ScaleValueInputs and SpinnerValueInputs (raised each time the value of the associated variable is modified).
- User-defined log messages can be generated using the new FSM operator `trace_text(ARGUMENTS)`. The operator allows including values of input elements identified by the user-defined id as well as the current value of FSM variables.
- The FSM operator `result_text(ARGUMENTS)` was extended to include multiple input elements identified by the user-defined id as well as the current value of FSM variables.

## SELECTED PUBLICATIONS BASED ON ASSESSMENTS WITH CBA ITEM BUILDER

Goldhammer, F., Kröhne, U., Keßel, Y., Senkbeil, M. & Ihme, J. M. (2014). Diagnostik von ICT Literacy: Multiple-Choice- vs. simulationsbasierte Aufgaben. *Diagnostica*, 60, 10-21.

Greiff, S., Wüstenberg, S., Holt, D. V., Goldhammer, F. & Funke, J. (2013). Computer-based assessment of Complex Problem Solving: concept, implementation, and application. *Educational Technology Research and Development*, 61, 407-421.

Rölke, H. (2012). The item builder: A graphical authoring system for complex item development. In Proceedings of World Conference on E-Learning in Corporate, Government, Healthcare, and Higher Education (pp. 344–353). Chesapeake, VA: AACE.

Upsing, B., Gissler, G., Goldhammer, F., Rölke, H., & Ferrari, A. (2011). Localisation in International Large-scale Assessments of Competencies: Challenges and Solutions. *Localisation Focus*, 10, 44-57.

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