Checklists in Construction DB

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Why checklists?

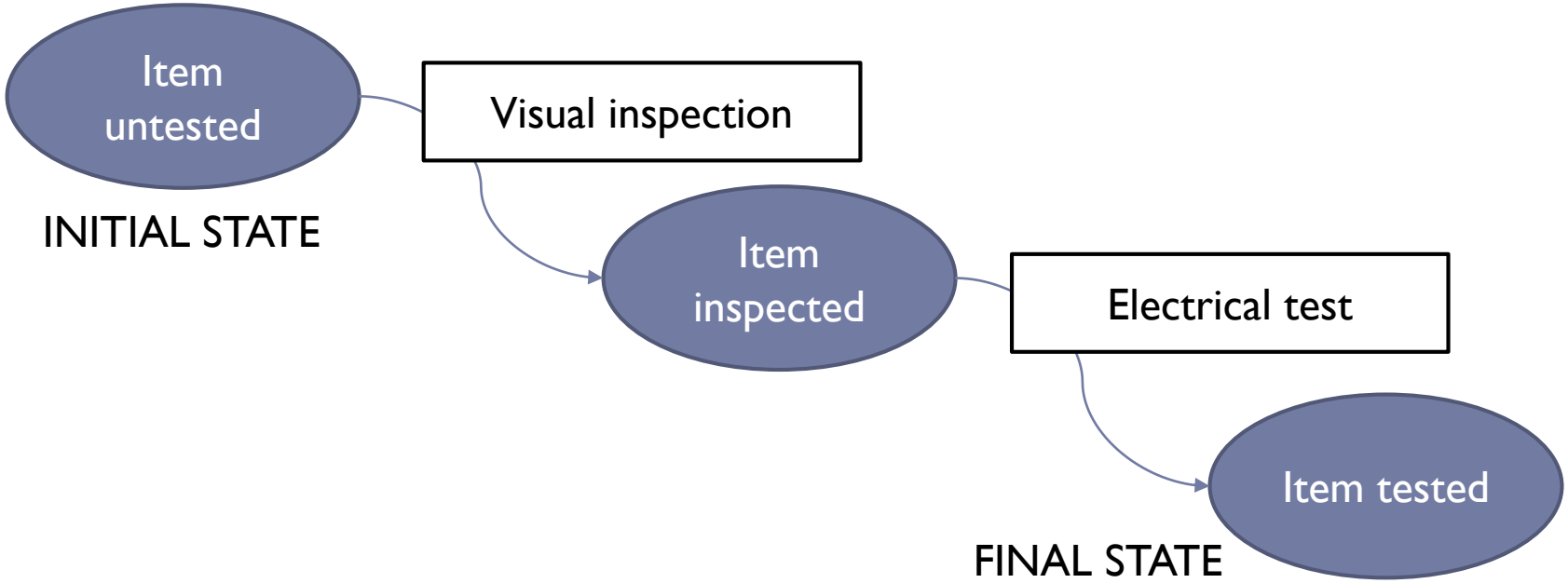
- Checklists are usually used to reduce possible human errors. They help to ensure consistency and completeness in carrying out a task

<u>Requirements</u>

- Each item in the DB must be supplied with a checklist
- The state of the item is automatically assigned by the DB management software according to the checklist
- Checklist implementation should guarantee high flexibility in order to follow the real laboratory workflow as much as possible

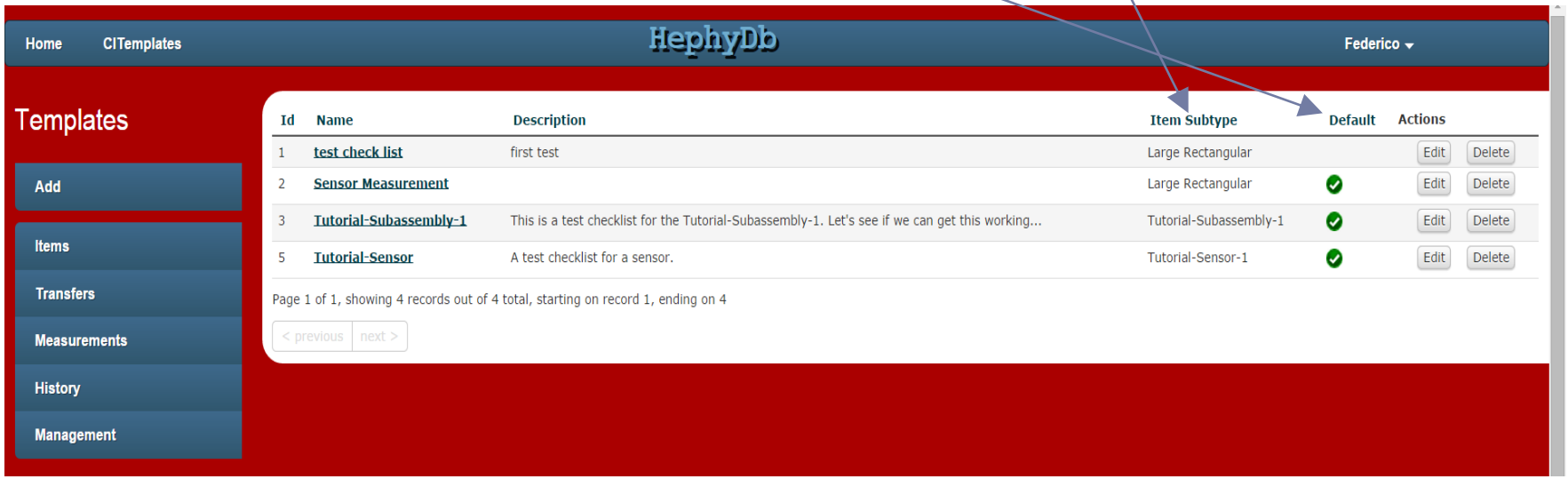
Checklist logic

- The checklist is implemented as a state machine
  - The checklist consists of a group of actions
  - Each action is associated to a set of possible source/target states
  - When the operator executes an action, the target state becomes the current item state



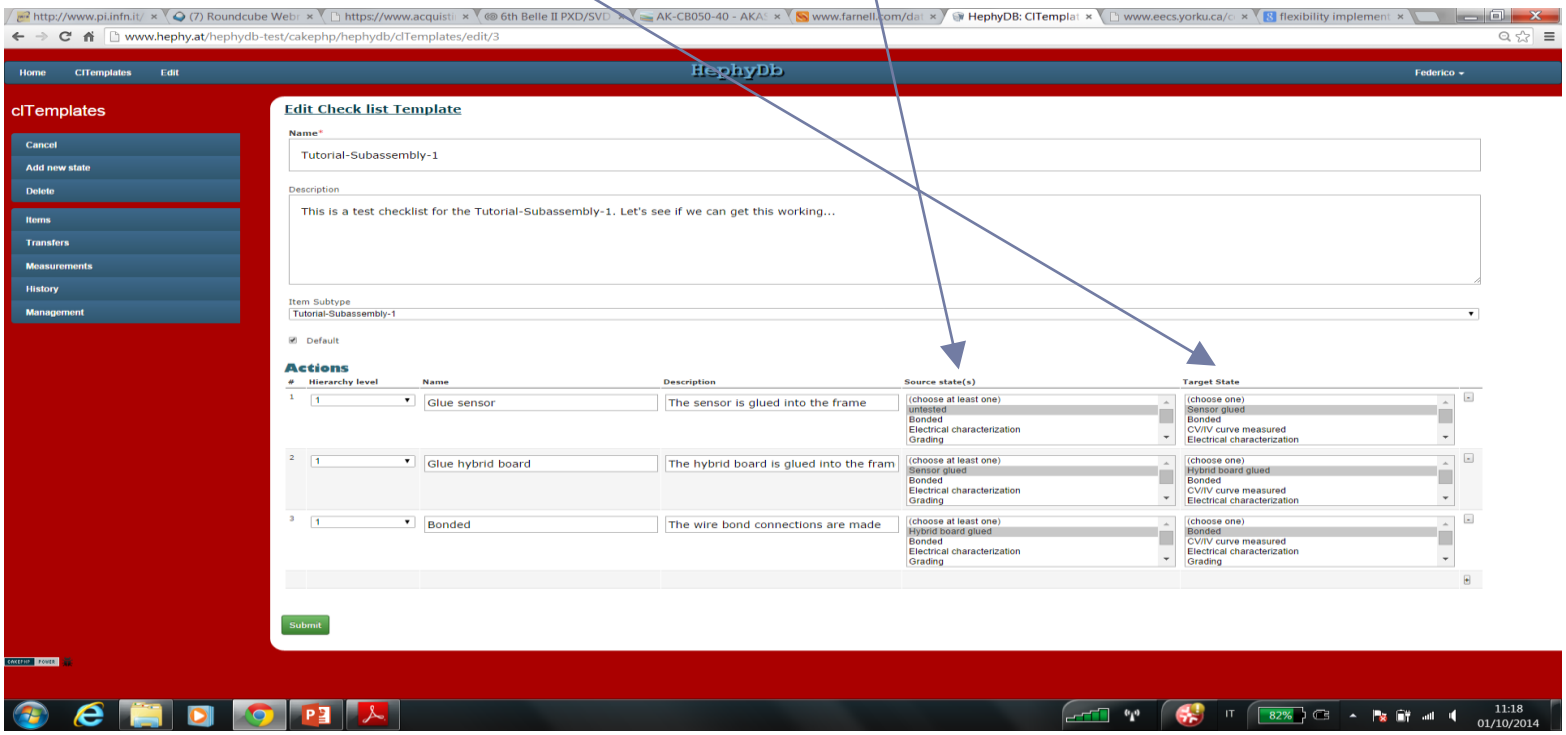
Checklist templates

- A checklist can be associated to a DB item choosing from a catalog of *checklist templates*
- Each template is linked to an *Item Subtype*
- A default template can be specified for each *Item Subtype*



Checklist templates

- To fill up a new template it is necessary to:
  - Create a new action (name, description)
  - Define the set of possible source states for that action
  - Define the target state after the action execution



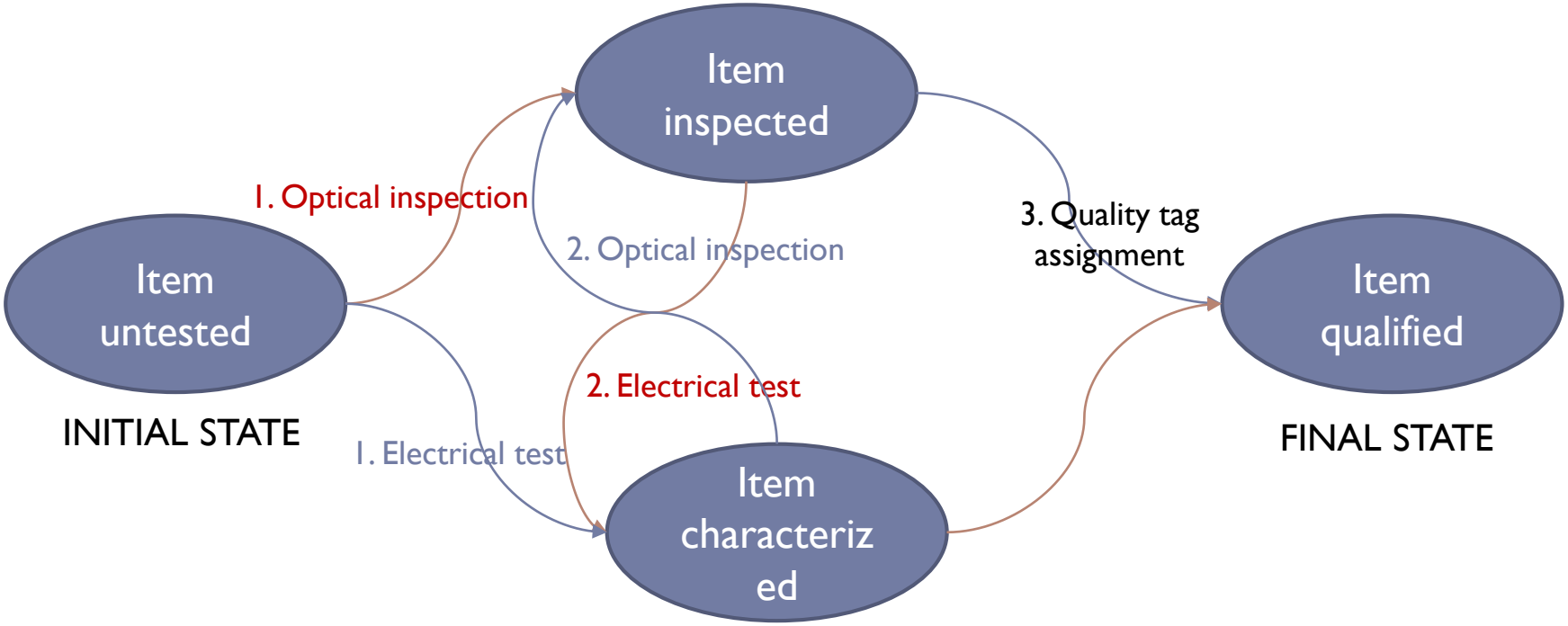
Implementation flexibility

- Actions have a 2-level hierarchy: a primary action contains a set of secondary actions
  - a primary action is considered as completed only when all its secondary actions have been executed
  - only the execution of a primary action allows the item state transition
- More detailed workflow description

2	1	Electrical characterization	IV, CV, stripscan	(choose at least one) visually inspected - OK Bonded Electrical characterization Grading	(choose one) Electrical characterization Bonded CV/IV curve measured Grading
2.1	2	IV, CV measured	IV, CV measured		
2.2	2	Stripscan done	Stripscan done		

Flexibility of the implementation

- A set of actions can be executed in unspecified order
  - Actions associated to several source states
  - Guarded transition of the state machine

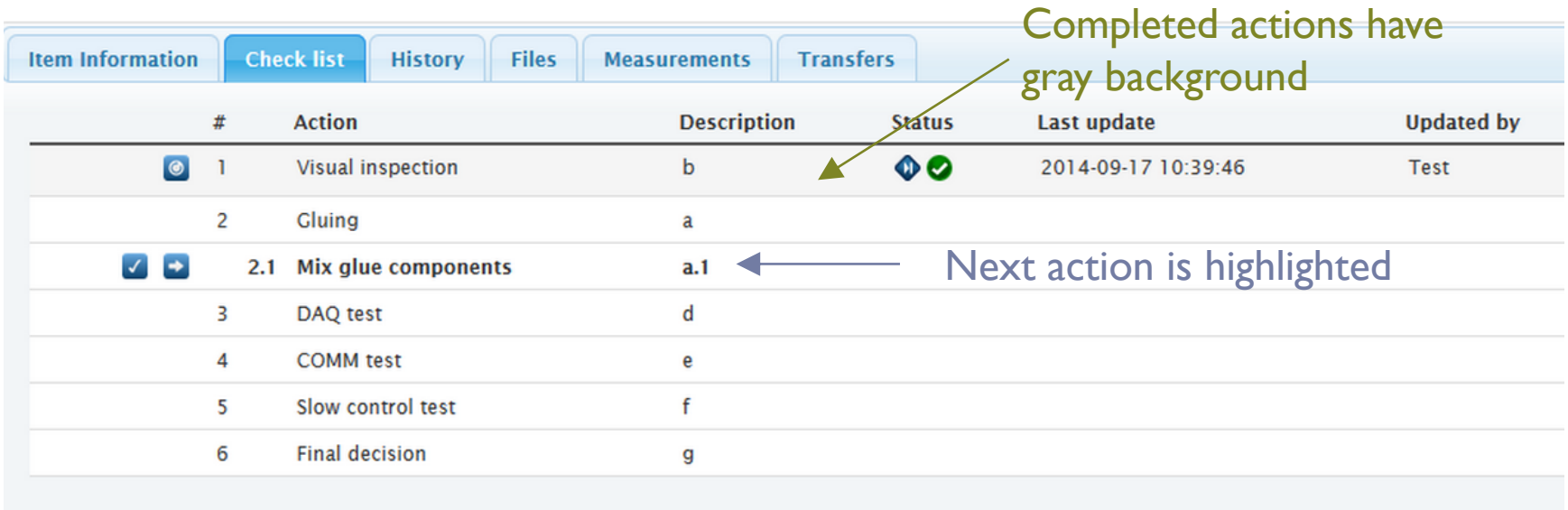


Checklist generation

- DB administrators are responsible for creation and maintenance of check list templates
- When a new item is registered/assembled its checklist is automatically generated using the default template
- If the default template is not found, the checklist is not created and the item state becomes *unset*
- After registration, the item checklist can still be edited or reassigned using a different template

Using the Check list (Operator duties)

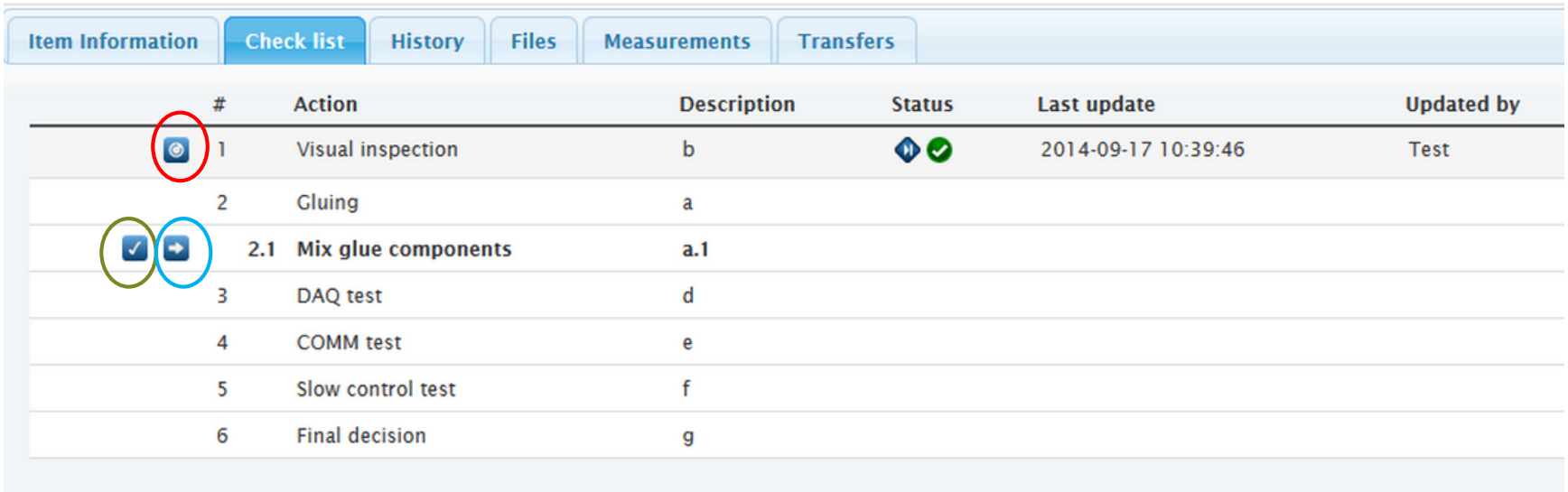
- According to the current item state, the DB management interface will suggest a set of possible actions that can be executed to advance in the check list



#	Action	Description	Status	Last update	Updated by
1	Visual inspection	b		2014-09-17 10:39:46	Test
2	Gluing	a			
2.1	Mix glue components	a.1			
3	DAQ test	d			
4	COMM test	e			
5	Slow control test	f			
6	Final decision	g			

Using the Check list (Operator duties)

- The Operator is allowed to:
  - Execute one of the suggested action
  - Force the check list logic and skip the actions
  - Go back to a previous (already completed) action and execute it again



Current status

- Checklist implementation in the DB management interface is in progress
  - Under test (in hephydb-test)
    - Add/edit check list templates
    - Register/assembly new items creating their checklist from the default template
    - Checklist operator interface
  - Still under development
    - Edit the check list after item registration or re-associate a new check list to an already existing item
    - Trace all the transitions/changes in the item history
    - Many other features and bug fixes ....