for reasoning about annotations and generating textual smart games

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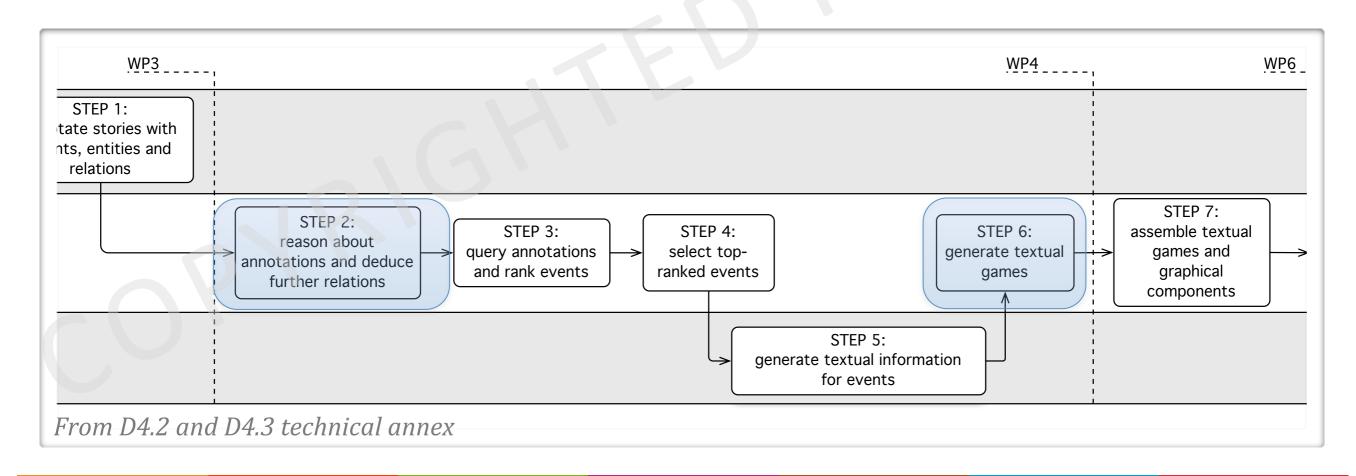
http://www.terenceproject.eu







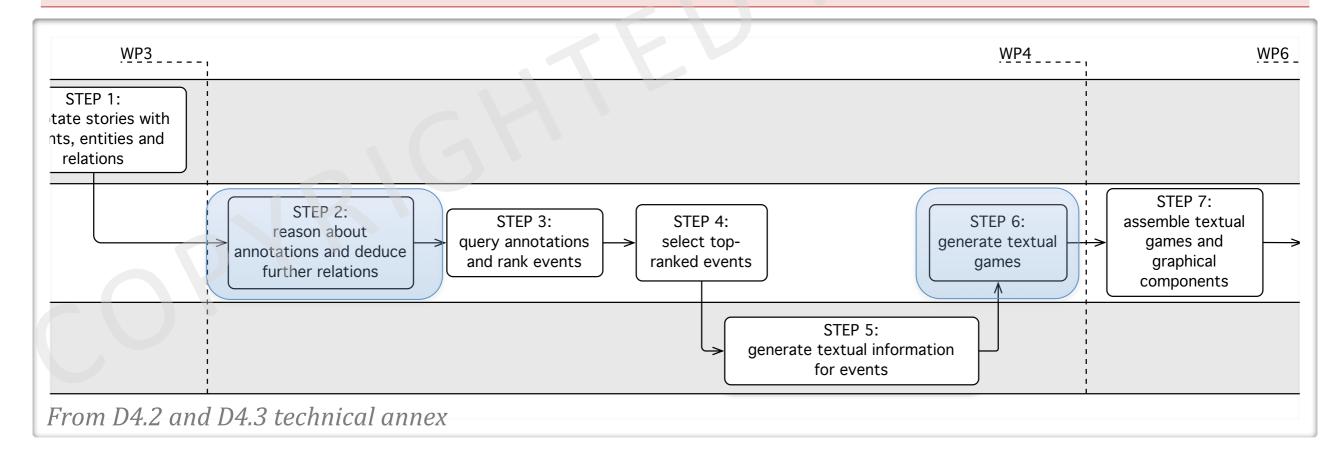








Deliverable	1 st release	2 nd release	3 rd release
D4.1	Sep. 2011		
D4.2	May 2012	November 2012	August 2013
D4.3	June 2012	December 2012	September 2013







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December

2013

2012

June 2012

D4.3





release 1

Automated Reasoning (AR) about stories:

- -semantics,
- –consistency checking
- -deduction of non-local TLINKs





release 1

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- -semantics,
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- -deduction of non-local TLINKs

Requirements for	Description
Difficulty levels	Macro levels for learners: - entry: character games; - intermediate: time games;
Scheduling of reading and playing	1st silent reading ; 2nd playing smart games; 3rd playing relaxing games
Constraints on actions	Learners should get faster, hence a game has a maximal resolution time
Progress and feedback	Monitor and give learners (1) idea of progress, (2) explanatory feedback, (3) recall their attention and solicit
Representation	Production can be impaired hence promote resolution via visual recreasentation and reasoning

Instructions	Questions		Motivation	nal		Intera	ction
Choices	Choices for lear	rner			Fixed even	t	
Solutions	Choices or their	r combina	ation. hat	are co	orrect/wron	g (c/w) s	solutions
Feedback	Interaction	Consiste	ncy (c/v	zı	olanatory		Solution
Smart points	Proportional to the learner's ability in the game level						
Relaxing points	Constant						
Avatar	Happy/sad stat	es					
Time	solution cons	tant		inte	raction co	nstant	
Rules	States of the sy	stem, act	ions of the	learr	ier, constrai	nts	

AR generation of textual games:

data structure design from game
 frameworks per level (from learner requirements)









Automated Reasoning (AR) about stories:

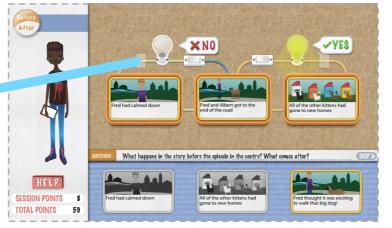
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AR generation of textual games:

- data structure design from game frameworks per level (from learner requirements)
- -generation of main data, e.g., central events and solutions, with generate-and-test









release 2

-AR generation of central events and solutions: from generate-and-test to generate-with-constraints

Algor	rithm 2 The before-after games generation algorithm
Requi	re: event e, story s, story $s_o \neq s$
1: fo	reach tlink t_1 in s , that has e as target do
2:	foreach tlink t_1 in s , that has e as source do from s so that s w includes/
3:	select a random event w from story s_o included by e
4:	create a before/after game that has:
5:	e as fixed event
6:	the source event of t_1 as before
7:	the target event of t_2 as after
8:	w as wrong event
9:	end for
10: e r	nd for



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release 2

- -AR generation of central events and solutions: from generate-and-test to generate-with-constraints
- -Natural language generation components for EN and IT

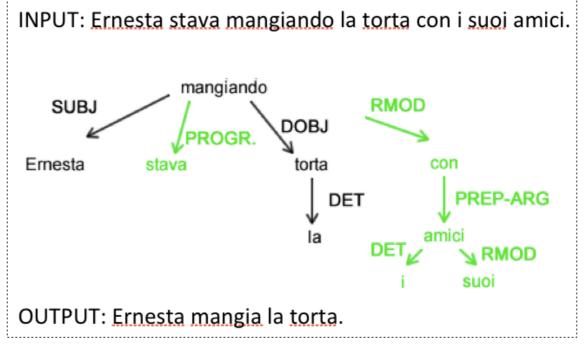
```
INPUT: Luke raced(event) past him and reached other end first.

(ROOT
(S
(NP (NNP Luke)) Subject (dependency info: N_subj)
(VP
(VP (VBD raced) verb = race, aspect = "simple"
(PP (IN past) Context (VP sub tree)
(NP (PRP him))))

"him" refers_to Ben ( Coreference )
(CC and)
(VP (VBD reached)
(NP (DT other ) (NN end)) Redundant information
(ADVP (RB first))))
(..)))

OUTPUT: Luke races past Ben / Who races past Ben?
```

```
Algorithm 2 The before-after games generation algorithm
Require: event e, story s, story s_o \neq s
1: foreach tlink t_1 in s, that has e as target do
                                                        from s so that
      foreach tlink t_2 in s, that has e as source do
                                                        w includes/
                                                       included_by e
 3:
         select a random event w from story s_o
 4:
         create a before/after game that has:
 5:
            e as fixed event
            the source event of t_1 as before
            the target event of t_2 as after
            w as wrong event
      end for
10: end for
```





Deliverable 1st release 2nd release 3rd release D4.2 May 2012 November August 2013

2012

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D4.3





release 3

Action 1: code optimisation for the generation workflow

Action 2: analysis of impact of WP7 evaluation, design revisions for generation components

Action 3: documenting of the workflow in technical annex to D4.2 and D4.3 and paper writing

Section 2.1: Section 2.2: The TERENCE The TERENCE **Smart Game** Annotation Language Design Section 2.2: The Allen Interval Algebra and Tractable Subalgebras Chapter 3: Chapter 4: Enrichment of Generation of Annotated Stories **Textual Games** Chapter 5: Generation of Game Events and Who Questions Chapter 6: The Importance of Being Plausible



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2012





release 3

Action 1: code optimisation for the generation workflow, e.g.,

- -for reasoning about stories,
 - hard consistency checking
 - relaxed consistency checking
- -for natural language generation components

From D4.2 and D4.3 technical annex

2013



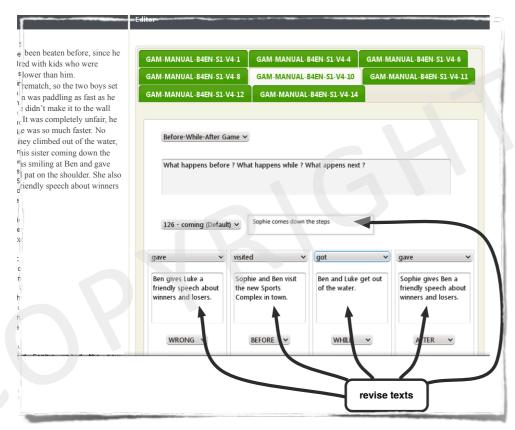
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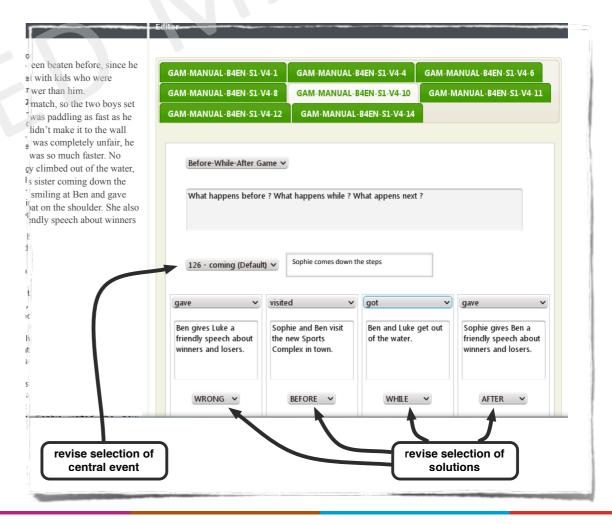
release 3

Action 2: (1) analysis of WP7 expert-based evaluation results, (2) design revisions (Y2-Y3). E.g.,

- for selection of central events and solutions



From D4.2 and D4.3 technical annex





TERENCE smart games

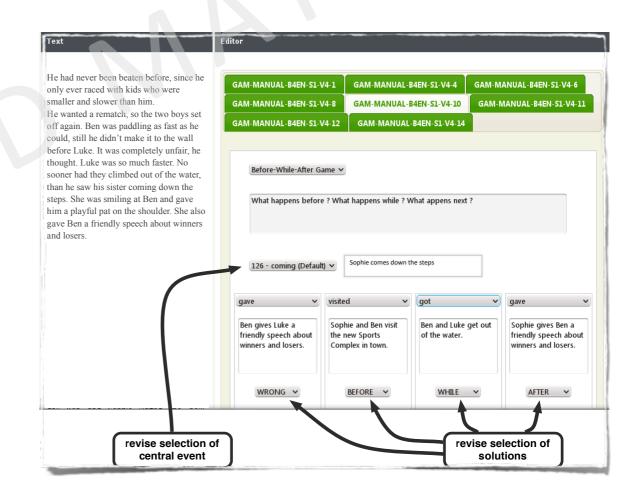




release 3: action 2

Selection of central events for games:

- >Results: only in 15 out of 250 cases (6%), it was necessary to select a different central event than the automatically generated one
- >Implications for WP4: none picked up





TERENCE smart games





release 3: action 2

Selection of plausible solutions:

>Results: out of 140 changes of selection of solutions, the majority was for wrong solutions

>Implications for WP4: WP4 mainly worked on optimising modules and developing new heuristics for wrong plausible solutions in the last part

of Y3,

- generate a wrong solution from correct one by changing participants, e.g.,

```
<correct_sentence id="2">
Sul razzo, viaggiano Ernesta e
la cagnolina Chiazza.
```

</correct_sentence>

<wrong_sentence id="2wh1" >
Sul razzo, viaggiano Ernesta e
Nerina.

</wrong_sentence>

He had never been beaten before, since he GAM-MANUAL-B4EN-S1-V4-1 GAM-MANUAL-B4EN-S1-V4-4 GAM-MANUAL-B4EN-S1-V4-6 only ever raced with kids who were smaller and slower than him. GAM-MANUAL-B4EN-S1-V4-8 GAM-MANUAL-B4EN-S1-V4-10 GAM-MANUAL-B4EN-S1-V4-11 He wanted a rematch, so the two boys set GAM-MANUAL-B4EN-S1-V4-14 off again. Ben was paddling as fast as he could, still he didn't make it to the wall before Luke. It was completely unfair, he thought. Luke was so much faster. No Before-While-After Game > sooner had they climbed out of the water, than he saw his sister coming down the steps. She was smiling at Ben and gave What happens before ? What happens while ? What appens next ? him a playful pat on the shoulder. She also gave Ben a friendly speech about winners 126 - coming (Default) V Ben gives Luke a Sophie and Ben visit Ben and Luke get out Sophie gives Ben a friendly speech about friendly speech about the new Sports AFTER ~ revise selection of revise selection of



TERENCE smart games





release 3: action 2

Development times:

- >*Results for revision time:*
 - 12,6 m. per game instance
 - ↑ times: 12,8 m. for time games
 - \downarrow time: 10,6 m. for who games
- > Results for creation time:
 - avg. 23 m. per game instance
- >Implications for WP4: the semiautomated development process is promising for optimising development times









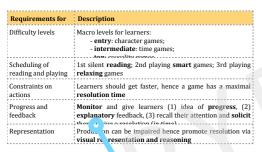
game over

Deliverable 1st release 2nd release :3rd release

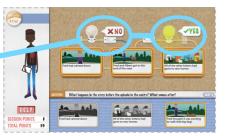
Sep. 2011 D4.1

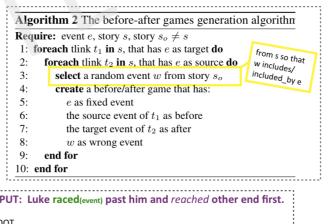
May 2012: November 2012: August 2013 **D4.2**

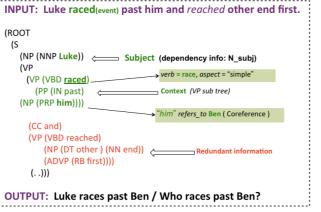
June 2012: December 2012: September 2013 **D4.3**

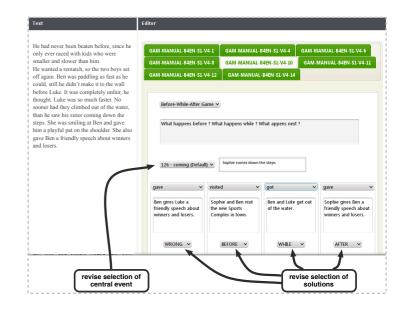


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Solutions	Choices or their comb	ination: hat a	re correct/wron	g (c/w) solutions		
Feedback	Interaction Consi	stency (c/v	explanatory	Solution		
Smart points	Proportional to the learner's ability in the game level					
Relaxing points	Constant					
Avatar	Happy/sad states					
Time	solution constant		interaction constant			
Rules	States of the system, actions of the learner, constraints					













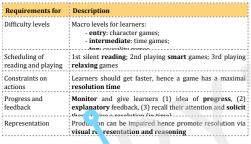
game over ?

Deliverable 1st release 2nd release :3rd release

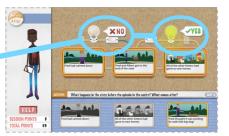
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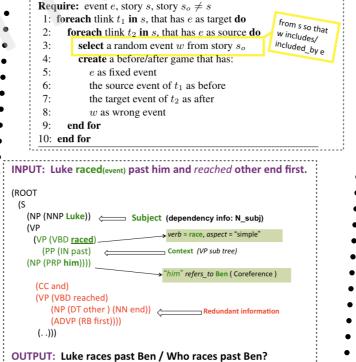
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Algorithm 2 The before-after games generation algorithm

