

TERENCE: An Adaptive Learning System for Reasoning about Stories with Poor Comprehenders and their Educators

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<http://www.terenceproject.eu>

CILC, Pescara

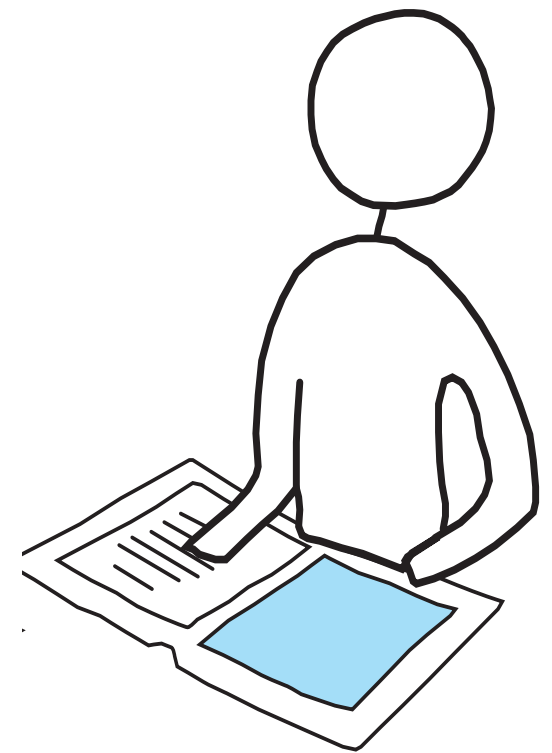
August 31st 2011



TERENCE

The TERENCE Idea in a Nutshell

- ▶ Primary school children from the age of 7-8 year old develop as independent readers. However, many of them do not.
- ▶ In particular, c.a 10% of 7-8 year old children become **poor text comprehenders**.



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- ▶ In particular, c.a 10% of 7-8 year old children become **poor text comprehenders**.
- ▶ If good comprehenders are able to
 - understand the main arguments of a story's event,
 - correlate a story's events,
 - reconstruct the temporal flow of the story's events,
 - recognise the main events of a story,
- ▶ poor comprehenders are generally unable to do it.



The TERENCE Project in a Nutshell

Mummy Duck watches the big egg but sees no signs of cracking. So she decides to keep sitting on it. After some days, while she is sitting on it, an ugly gray duckling cracks the big eggshell...

- ▶ Who breaks the big eggshell?
- ▶ Does the big eggshell crack before Mummy Duck watches it?

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 - understand the main arguments of a story's event,
 - correlate a story's events,
 - reconstruct the temporal flow of the story's events,
 - recognise the main events of a story,
- ▶ poor comprehenders are generally unable to do it.
- ▶ TERENCE is an FP7 European project for the development of an **adaptive learning system** (ALS) for poor comprehenders, with adequate stories and games as **learning material**.



The TERENCE consortium

Partner	Main contribution	Country
UnivAQ	KR, HCI, EM	Italy
LUB	KR	Italy
LUH	ALS, KR, NLP	Germany
KUL	NLP	Belgium
FBK	NLP	Italy
MOME	VR	Hungary
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SIVECO	Dissemination	Romania

2 External Experts: Marc Marschark (USA); Paul van den Broek (NL)

VR=Visual Representation; HCI=Human Computer Interaction; EM=Evidence-based Medicine; SOA=Service Oriented Architecture; NLP=Natural Language Processing; KR=Knowledge Representation & Reasoning; C&E= Cognitive and Educational

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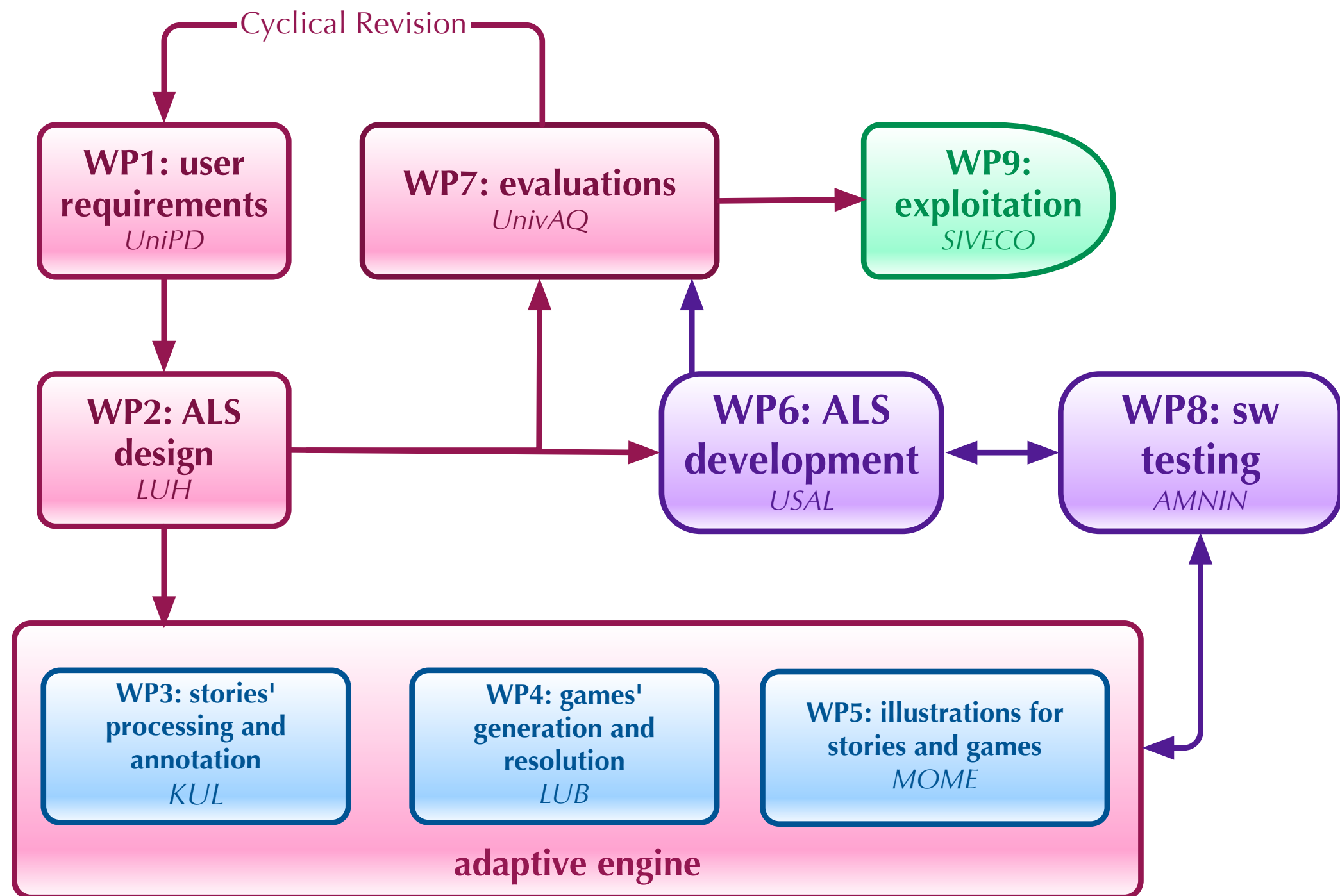
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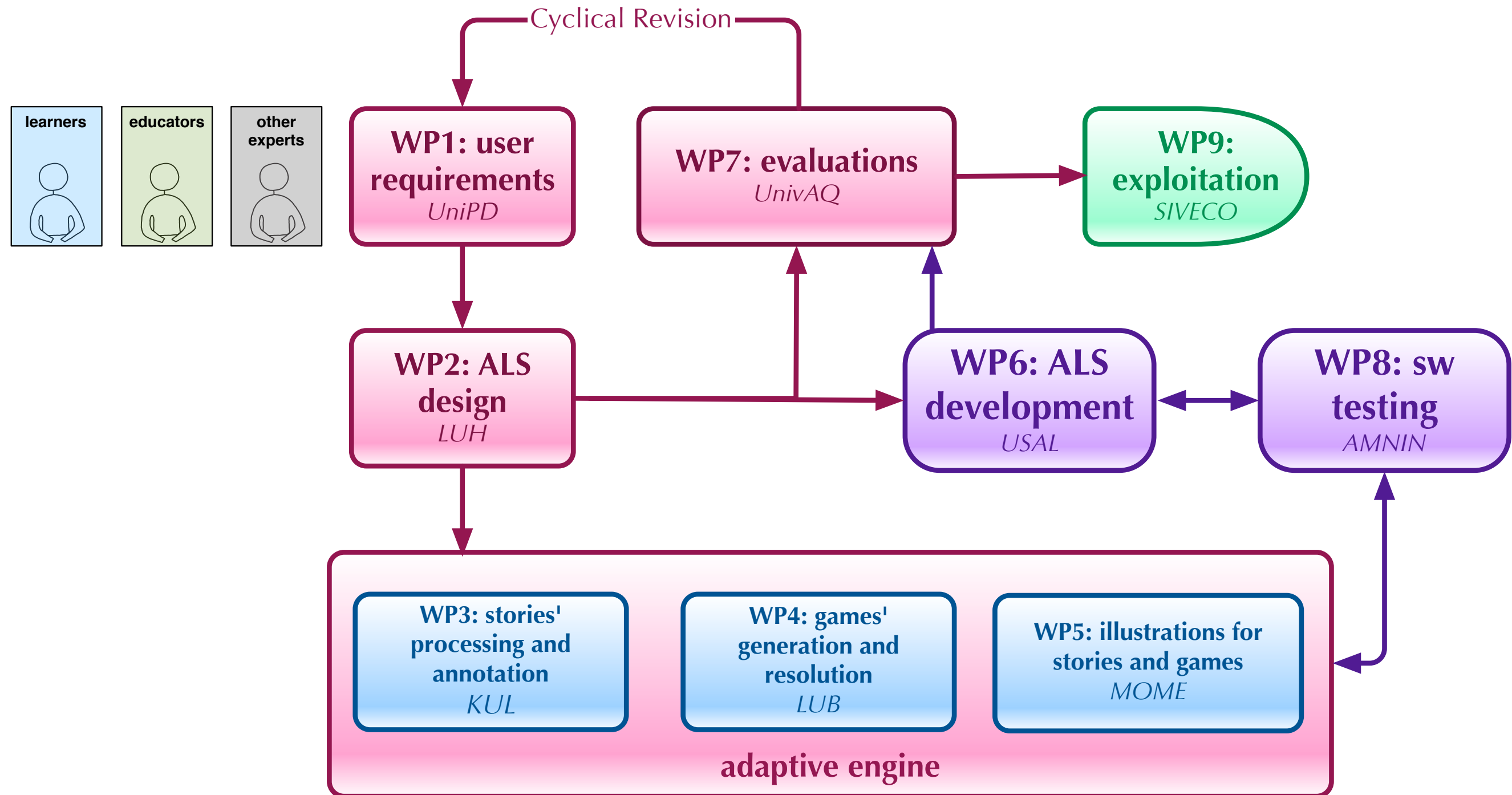
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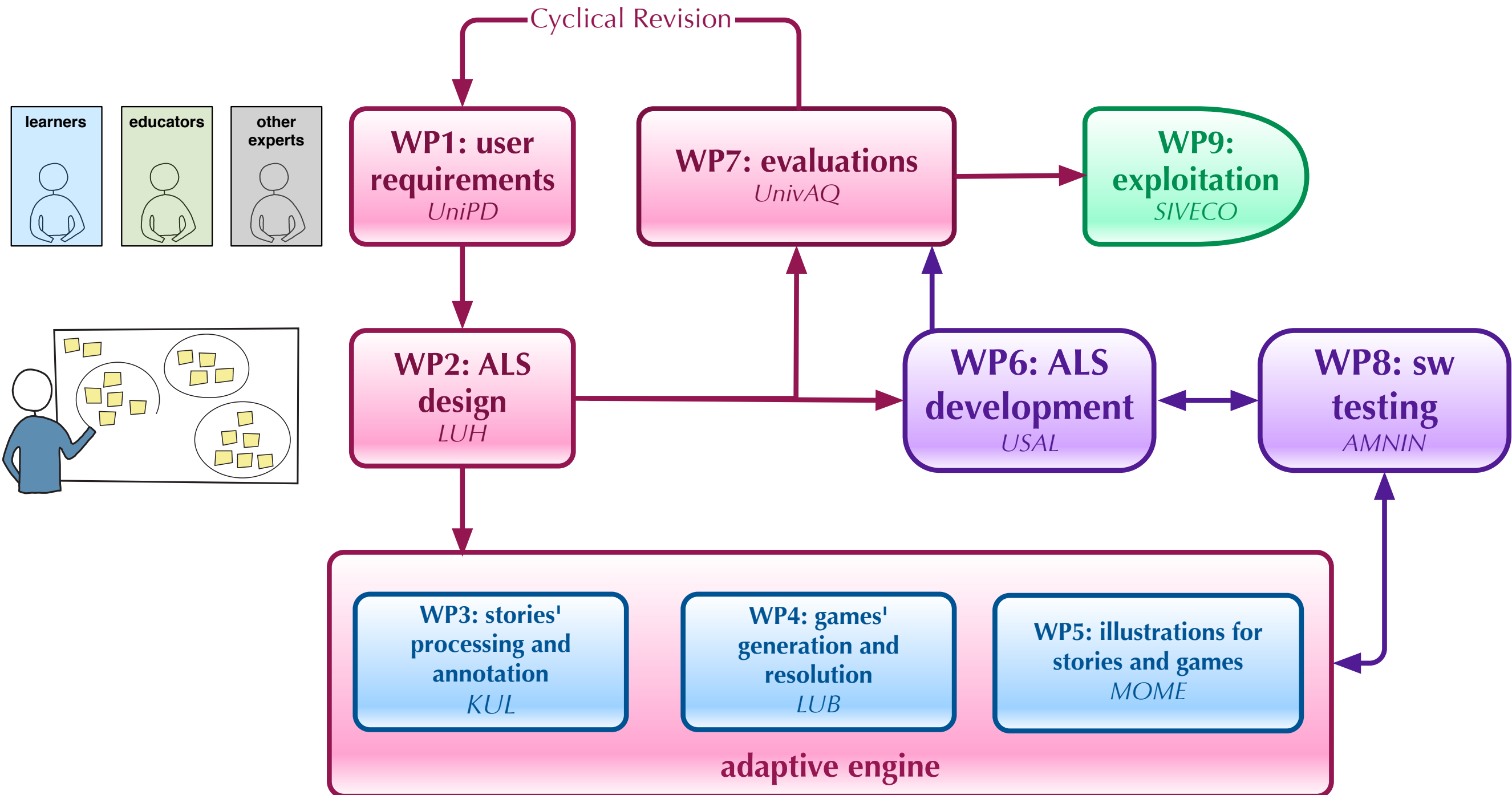
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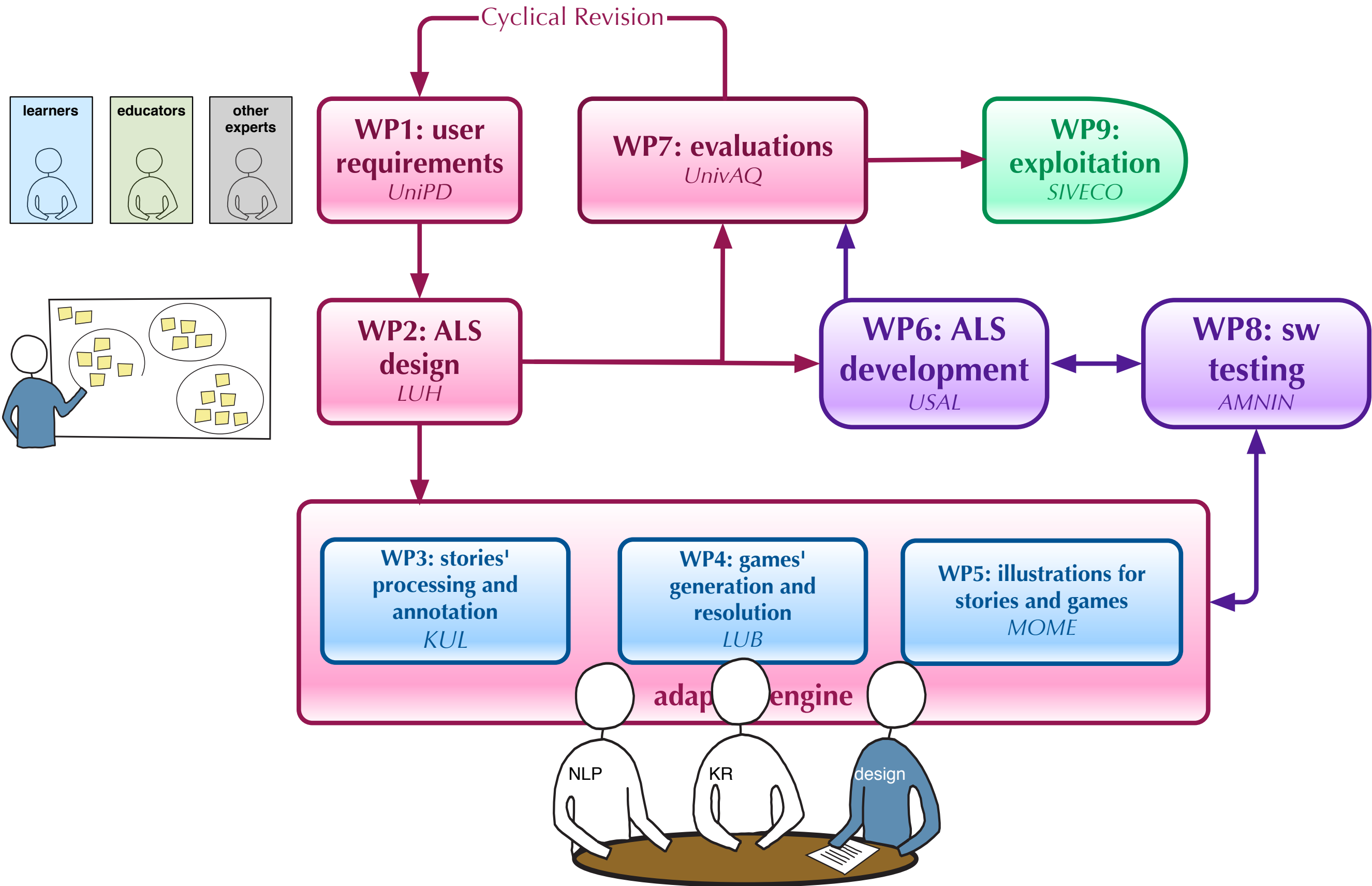
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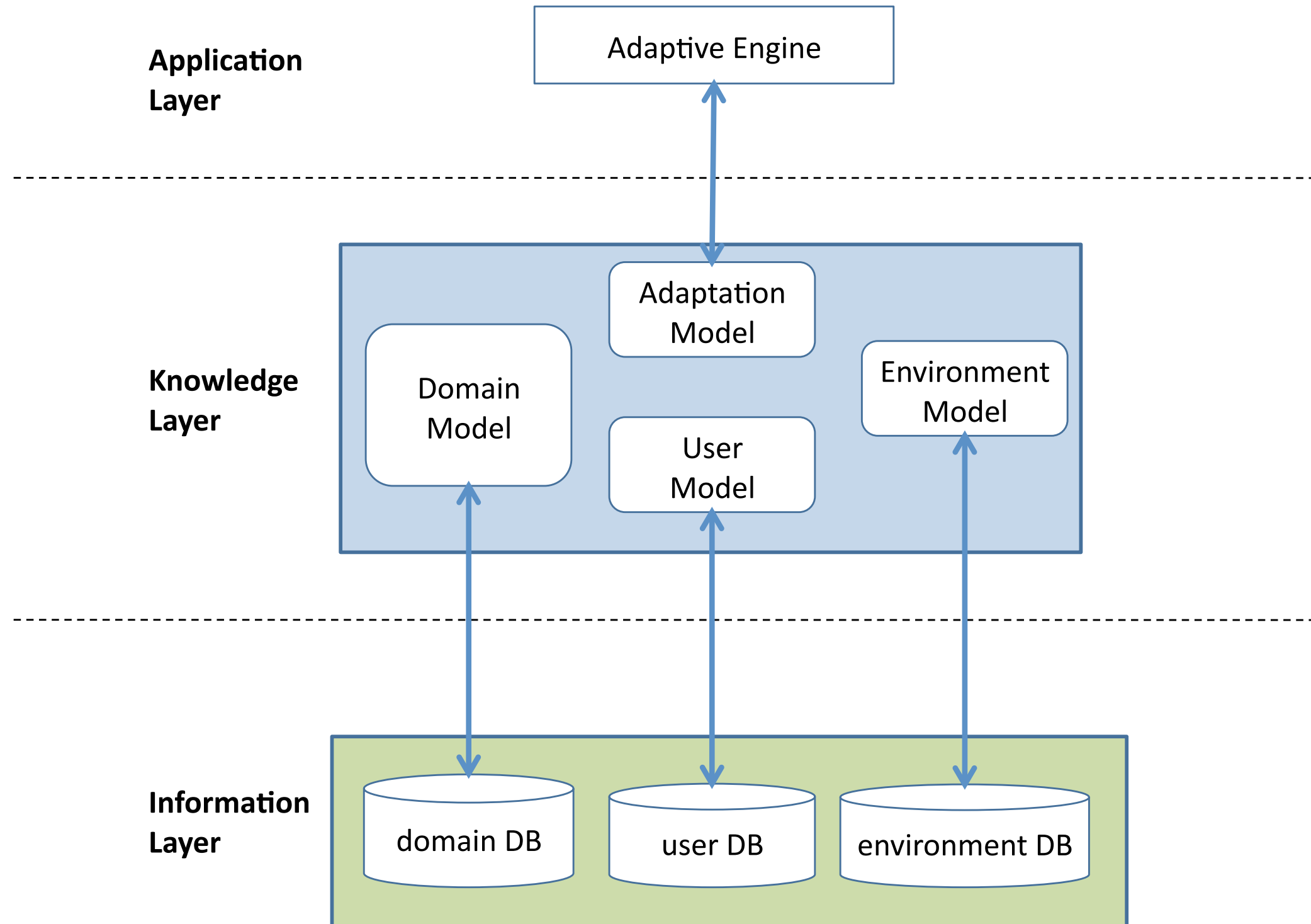
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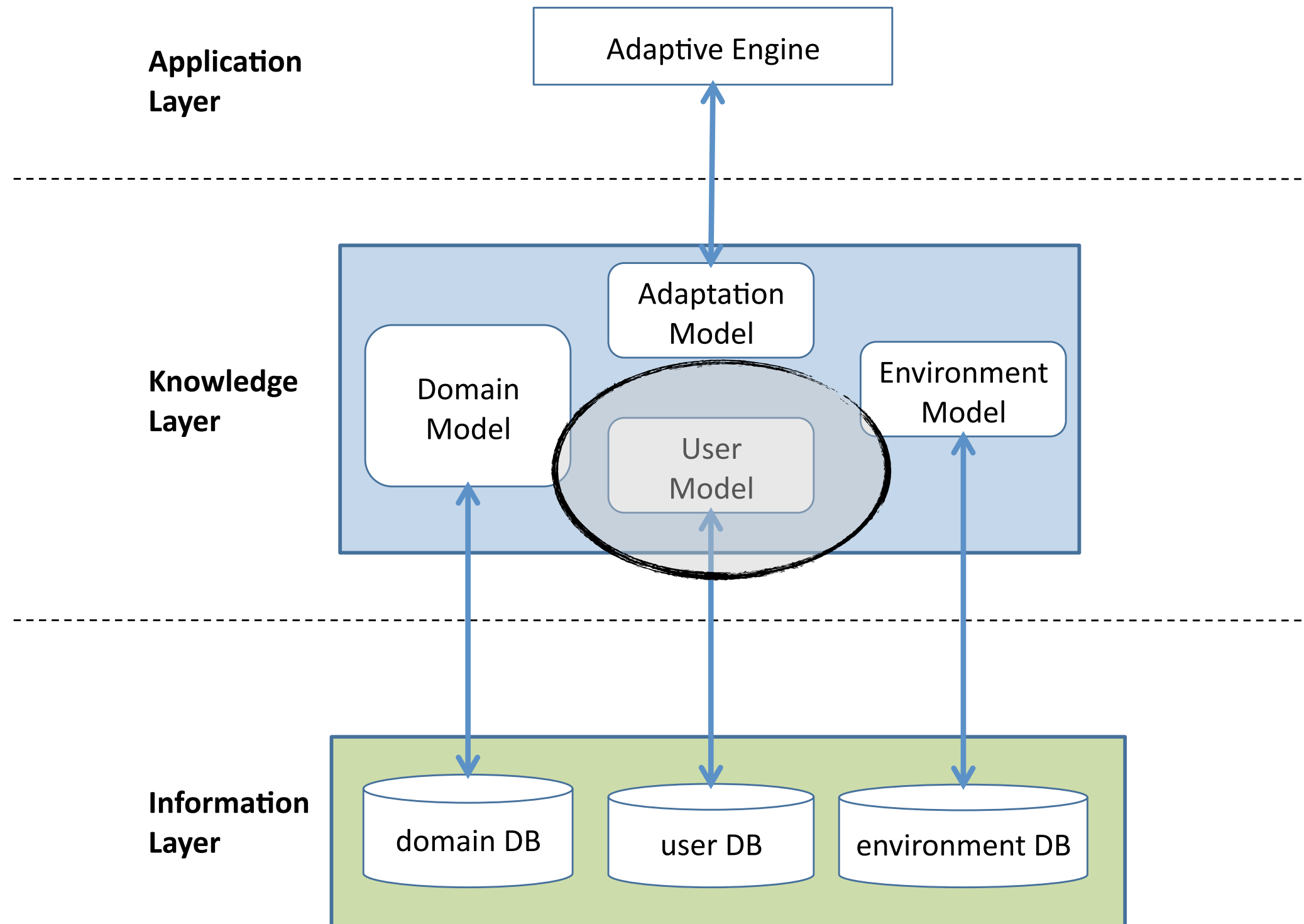
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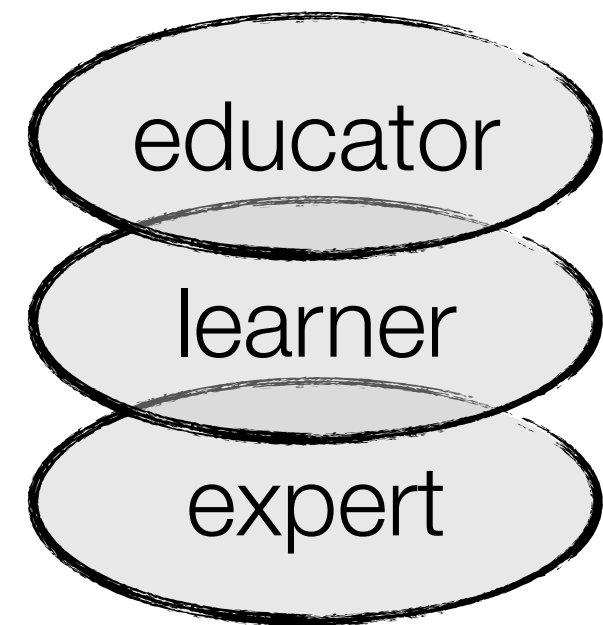
The Knowledge Layer



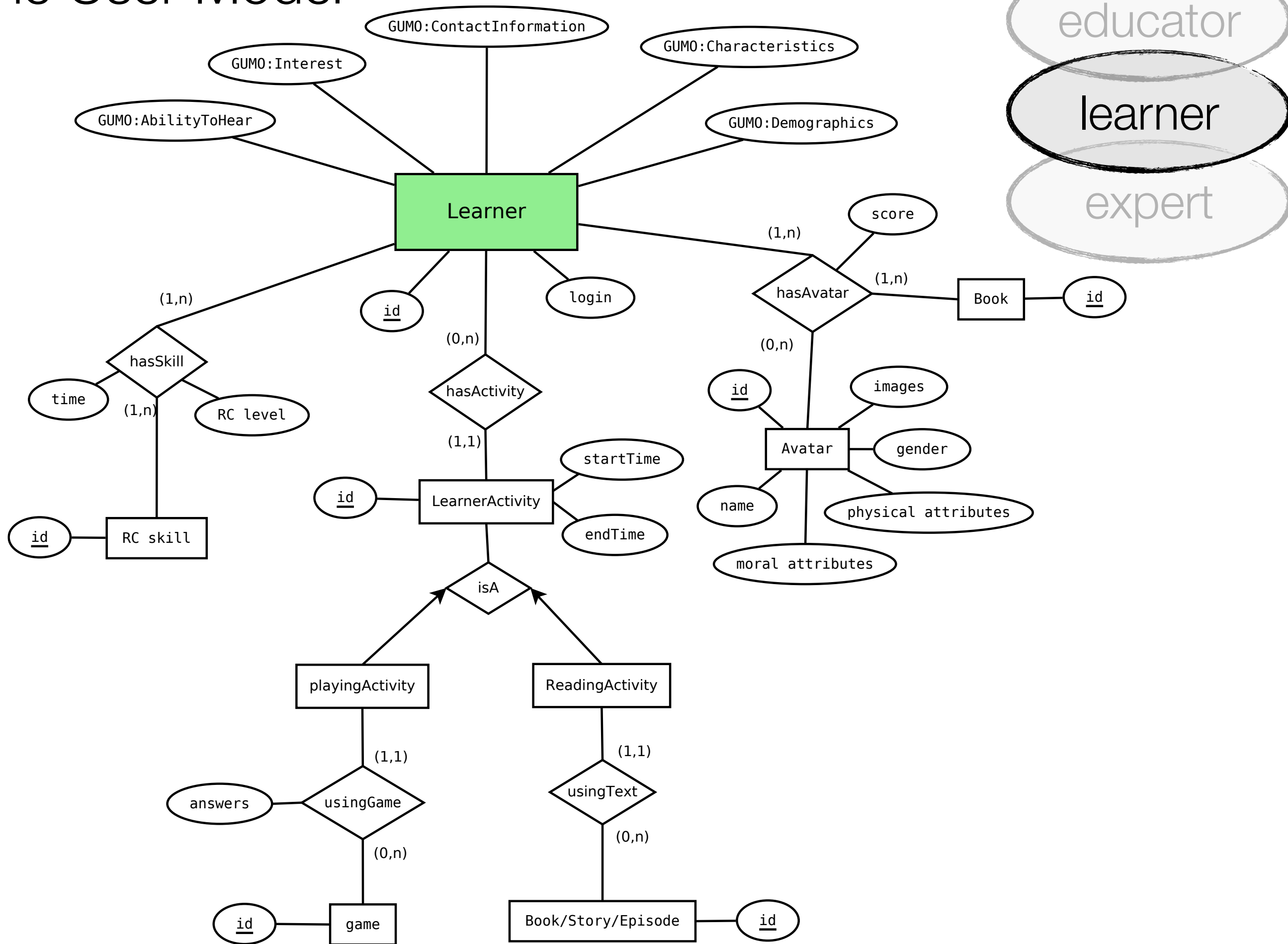
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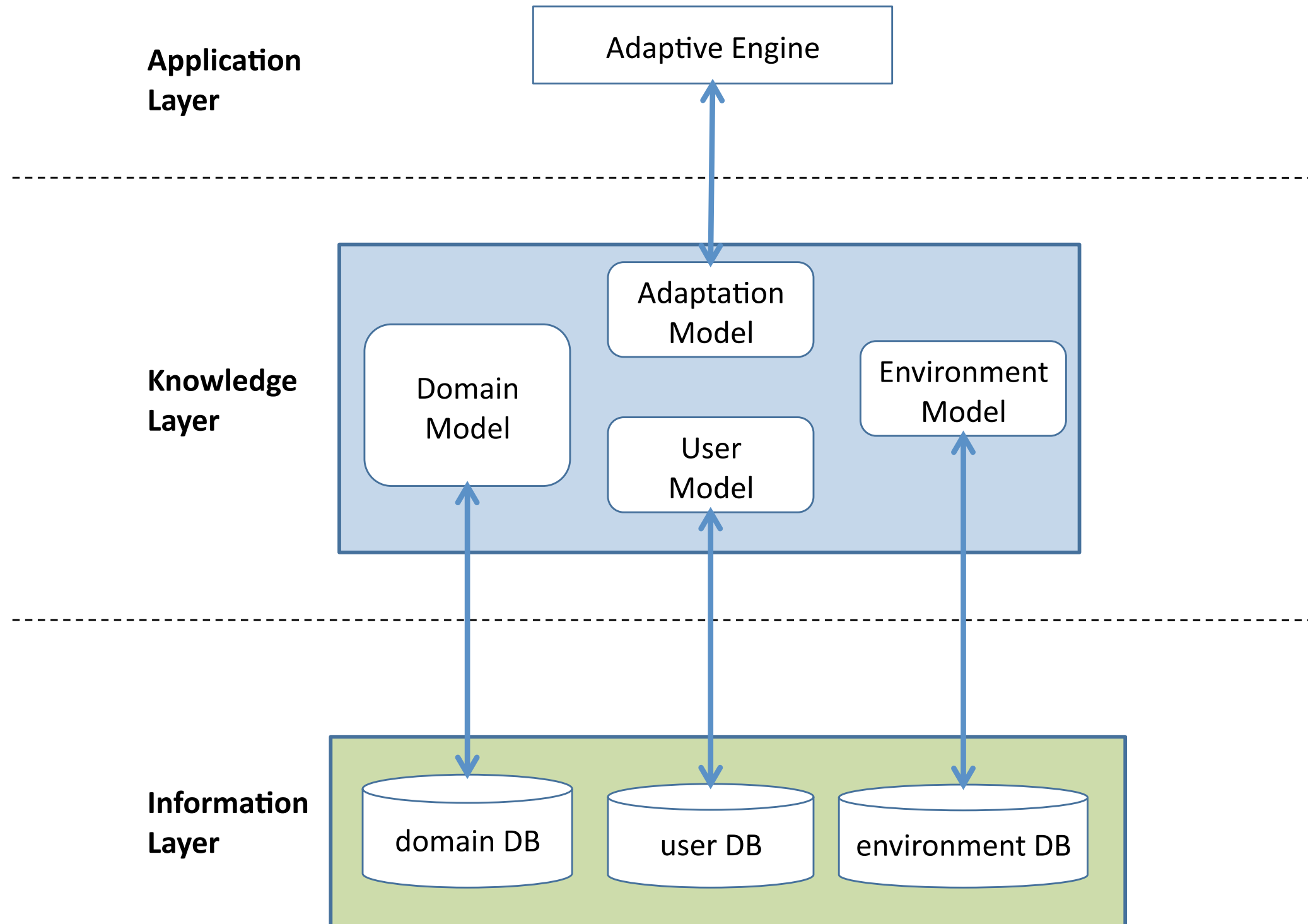
The User Model



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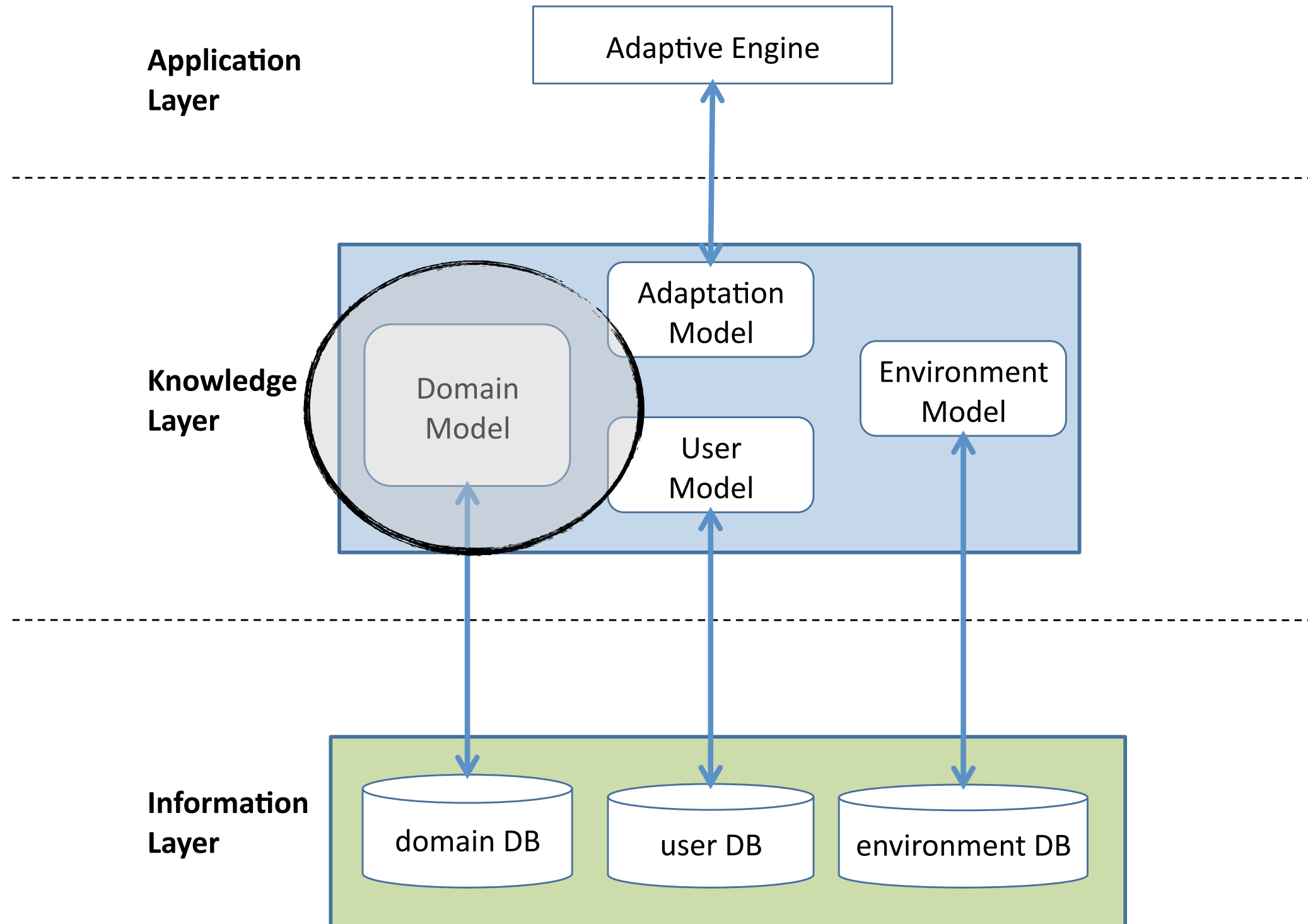


The Knowledge Layer*



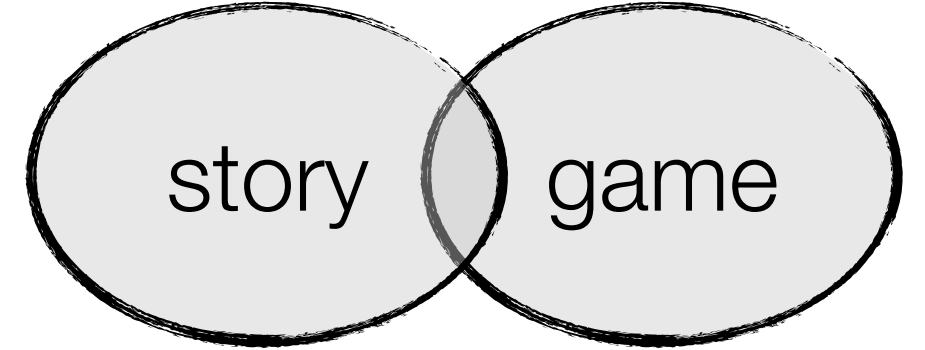
* On-going work with M. Alrifai and T. Iofciu

The Knowledge Layer*

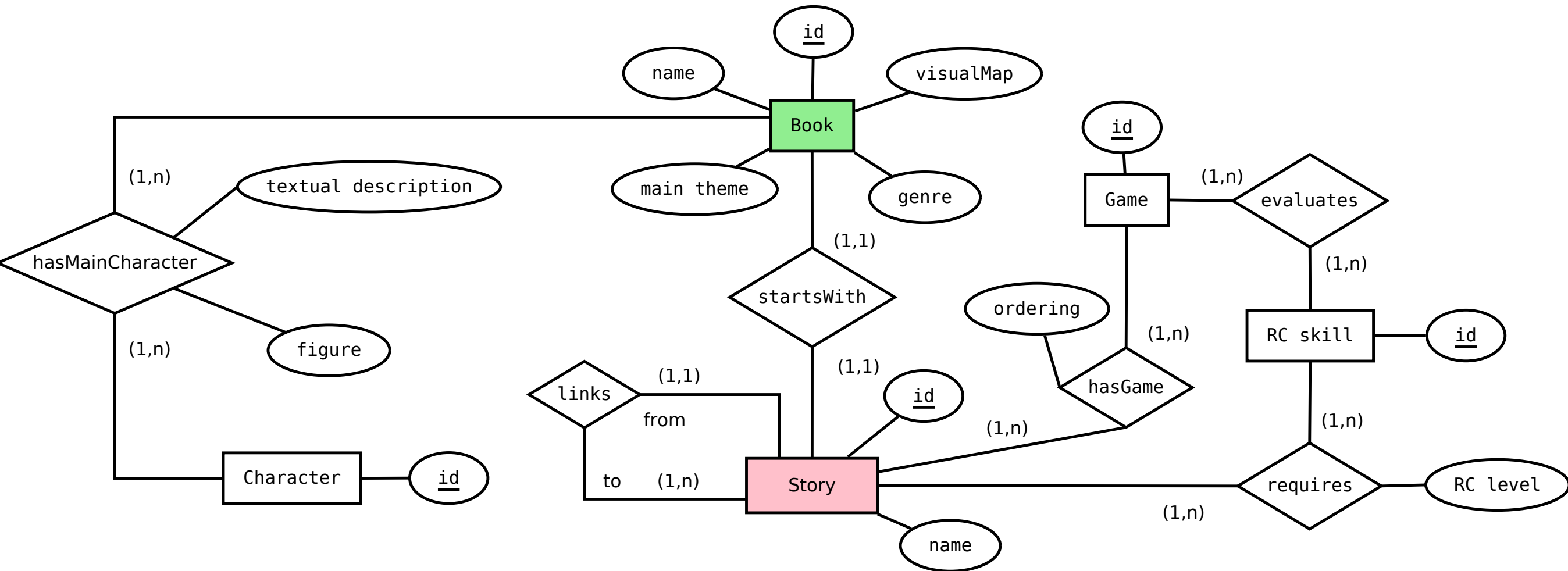
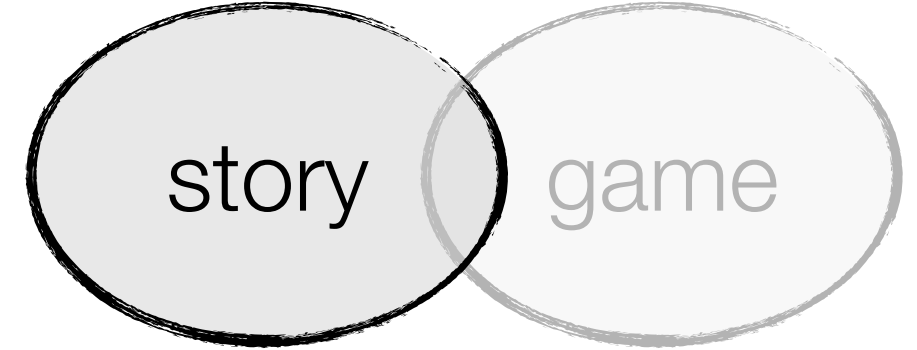


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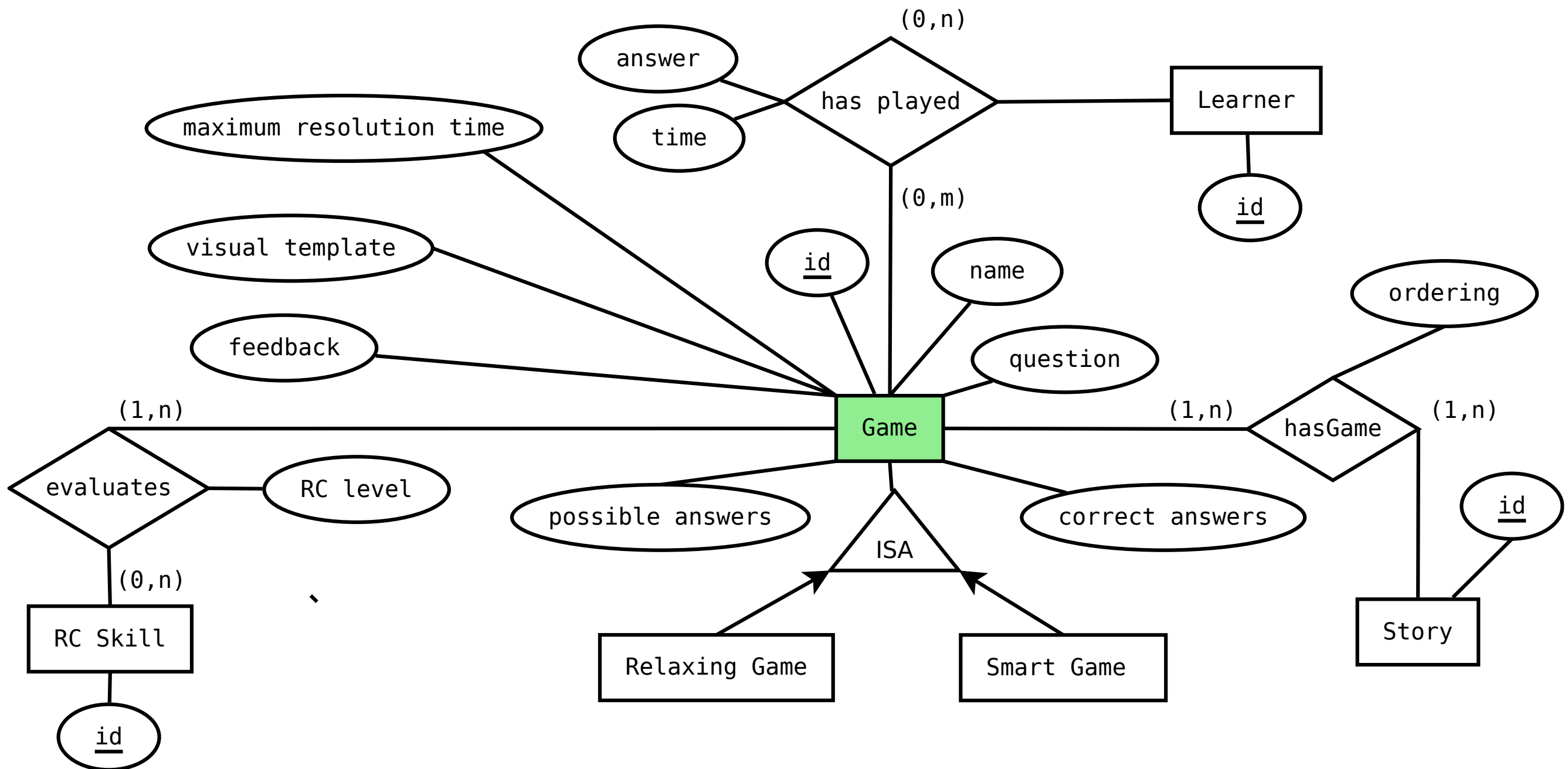
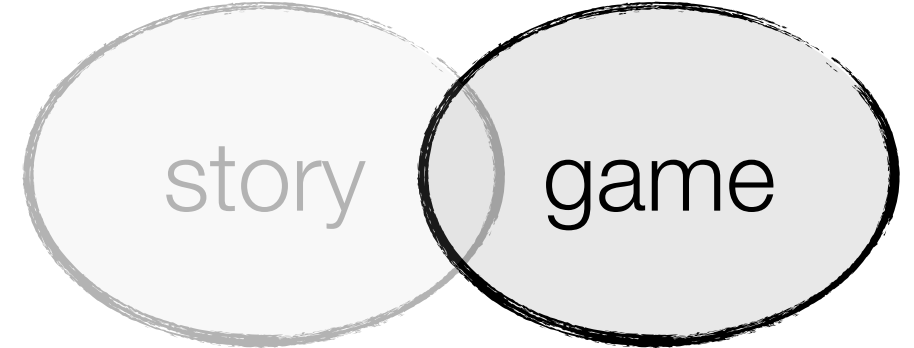
The Domain Model of TERENCE



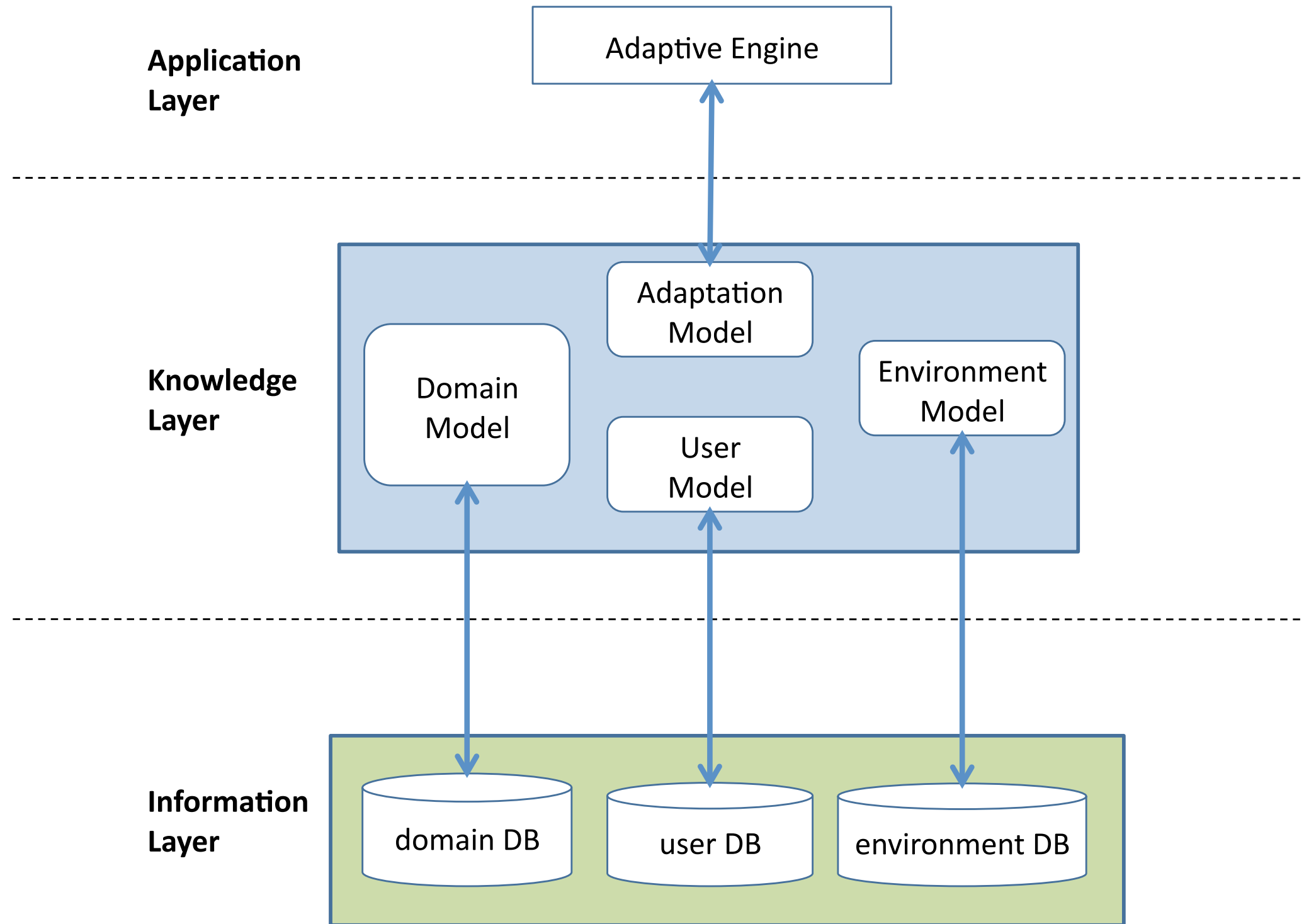
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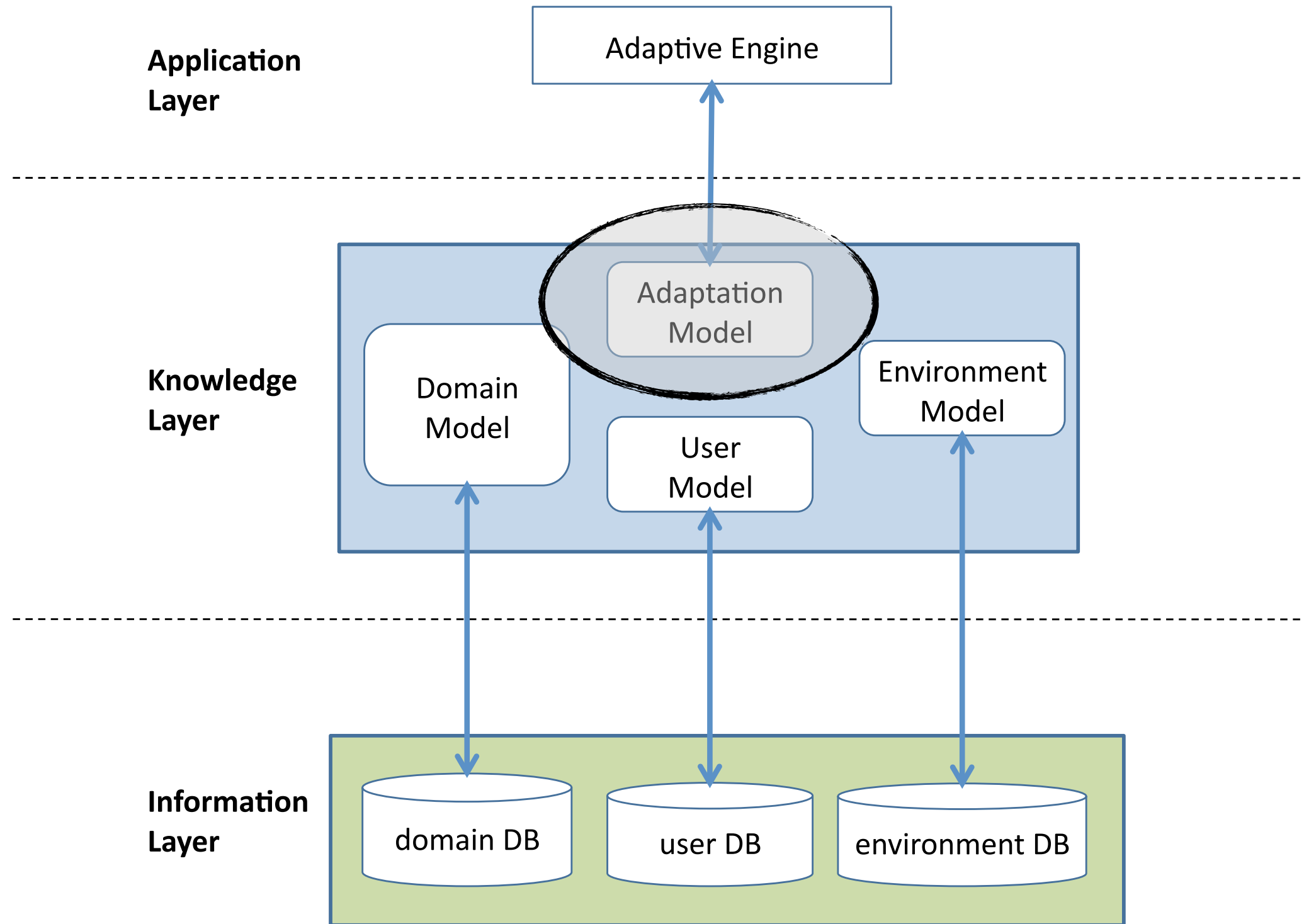
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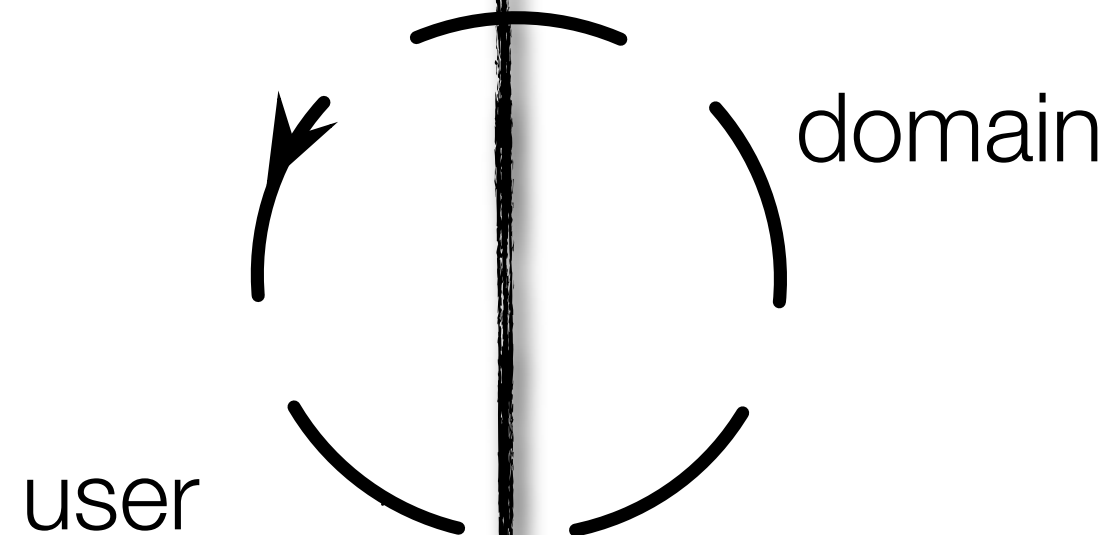
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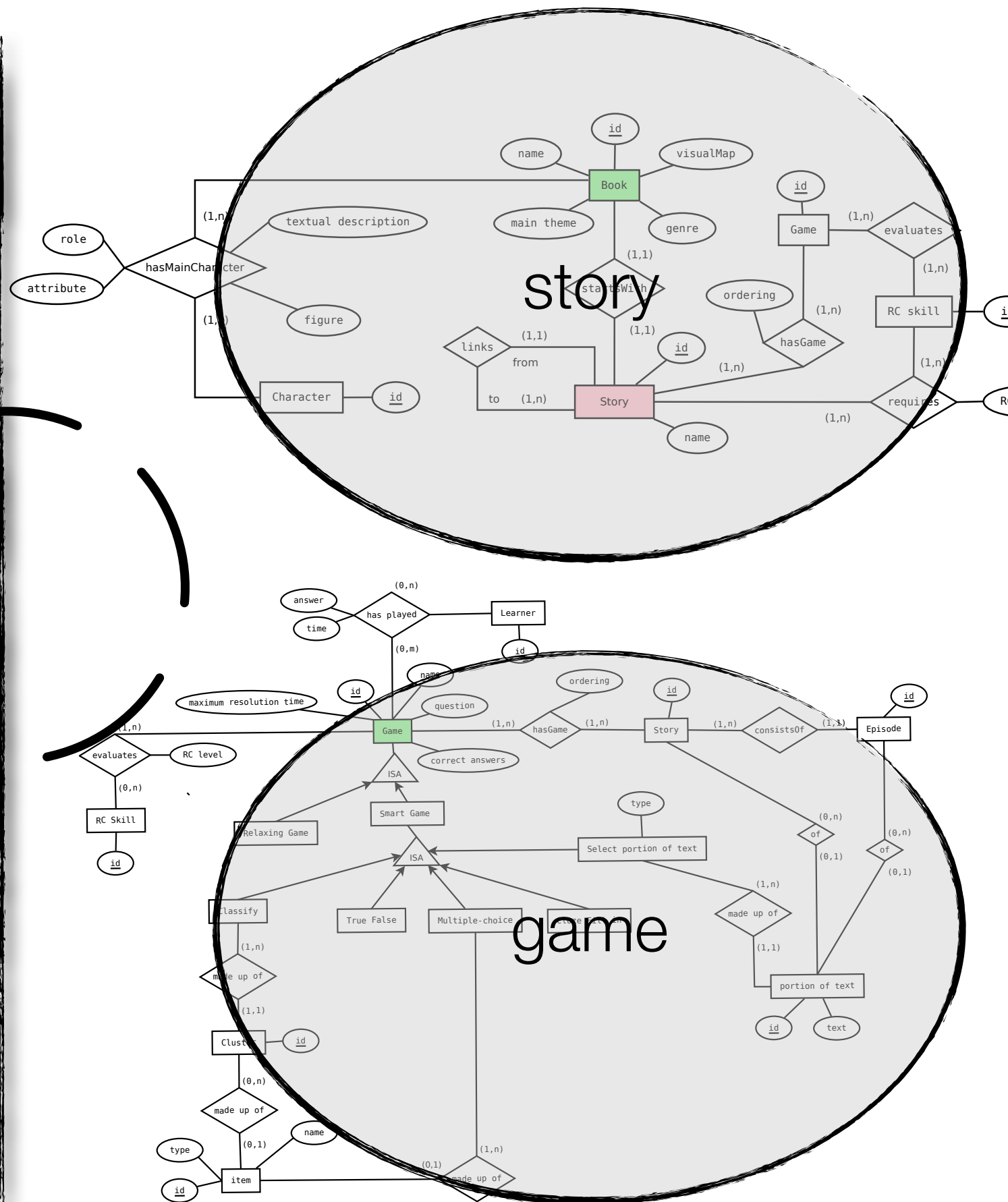
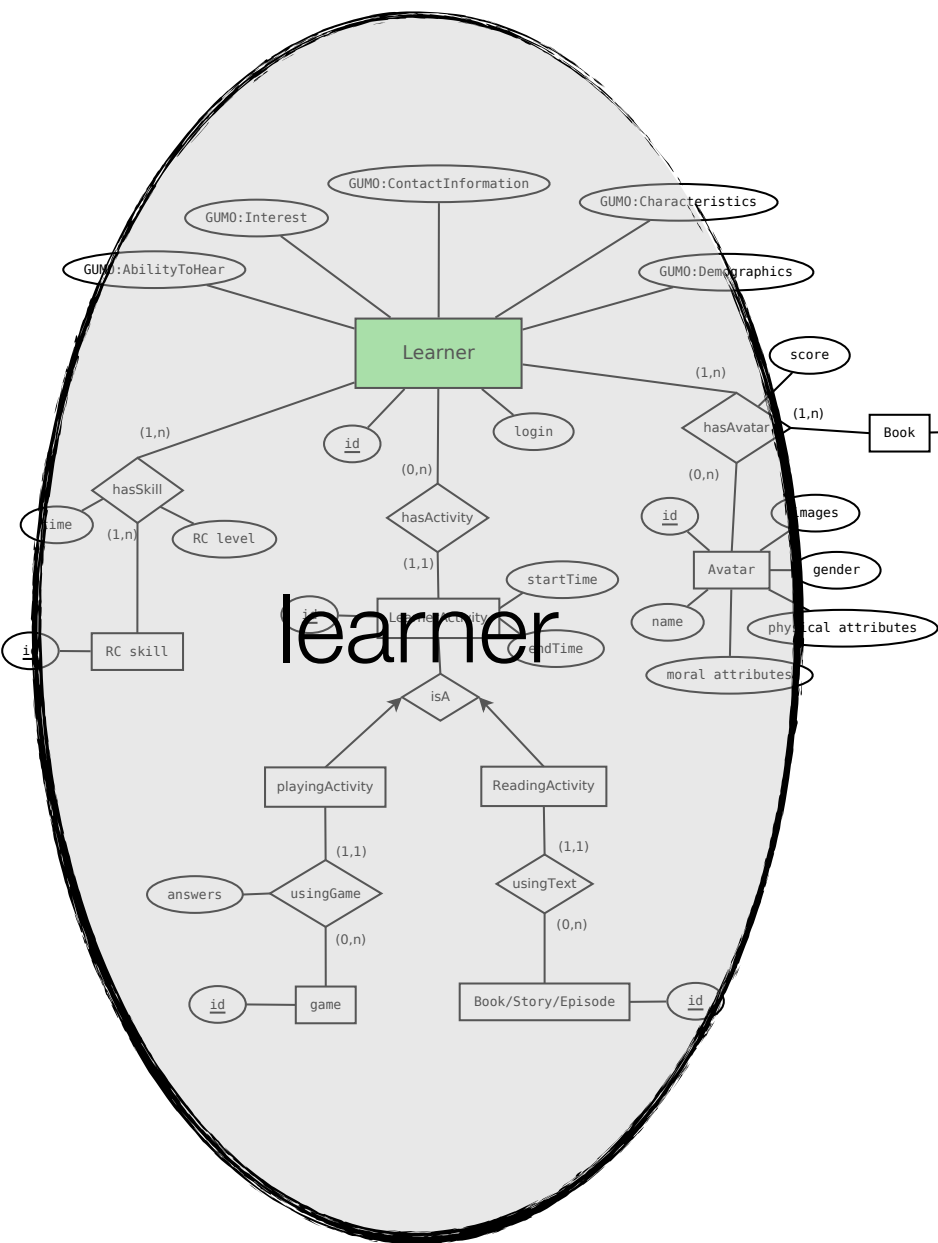
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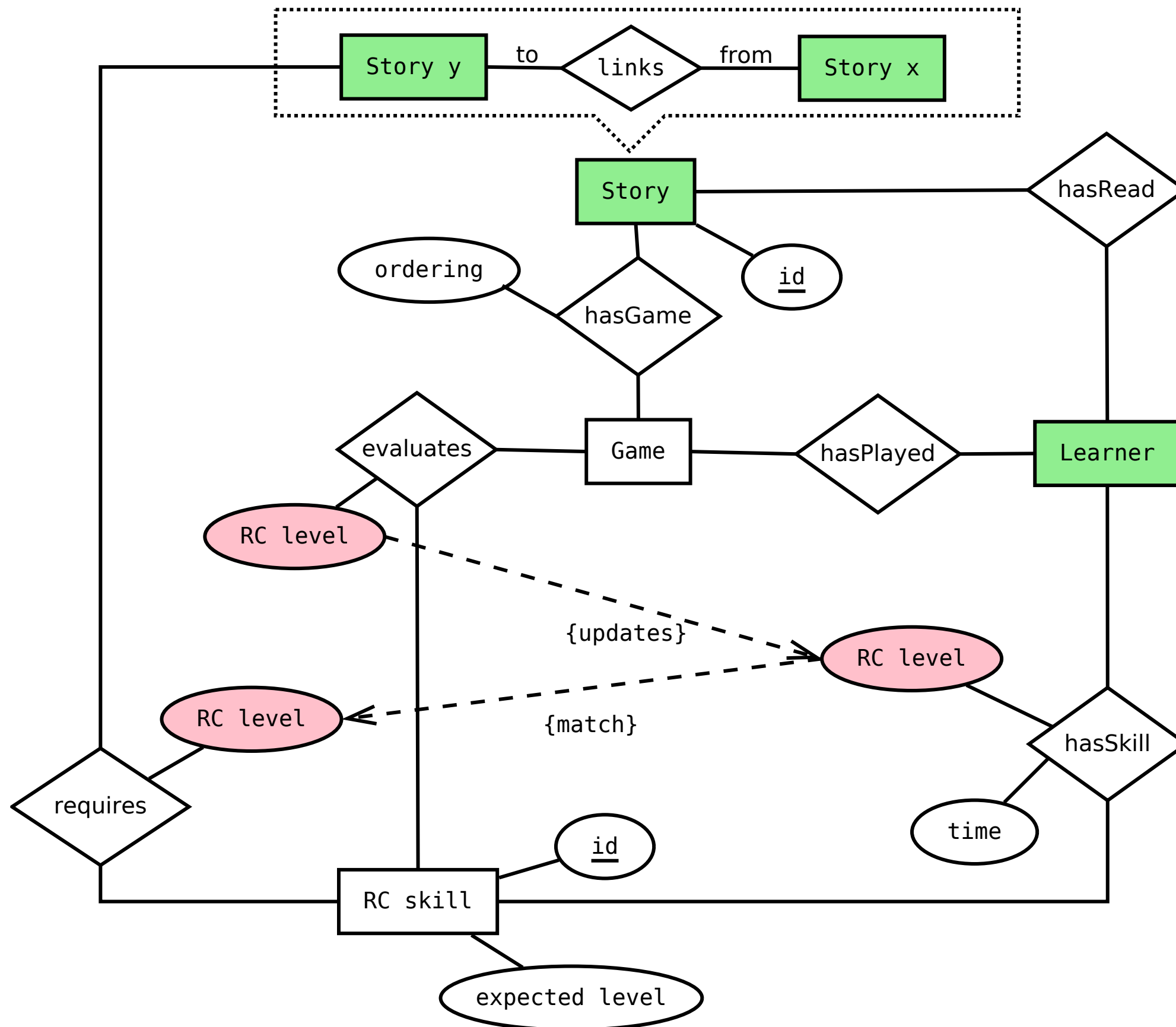
The Adaptation Model



The Adaptation Model



The Adaptation Model



Acknowledgments

Our thanks are due to:

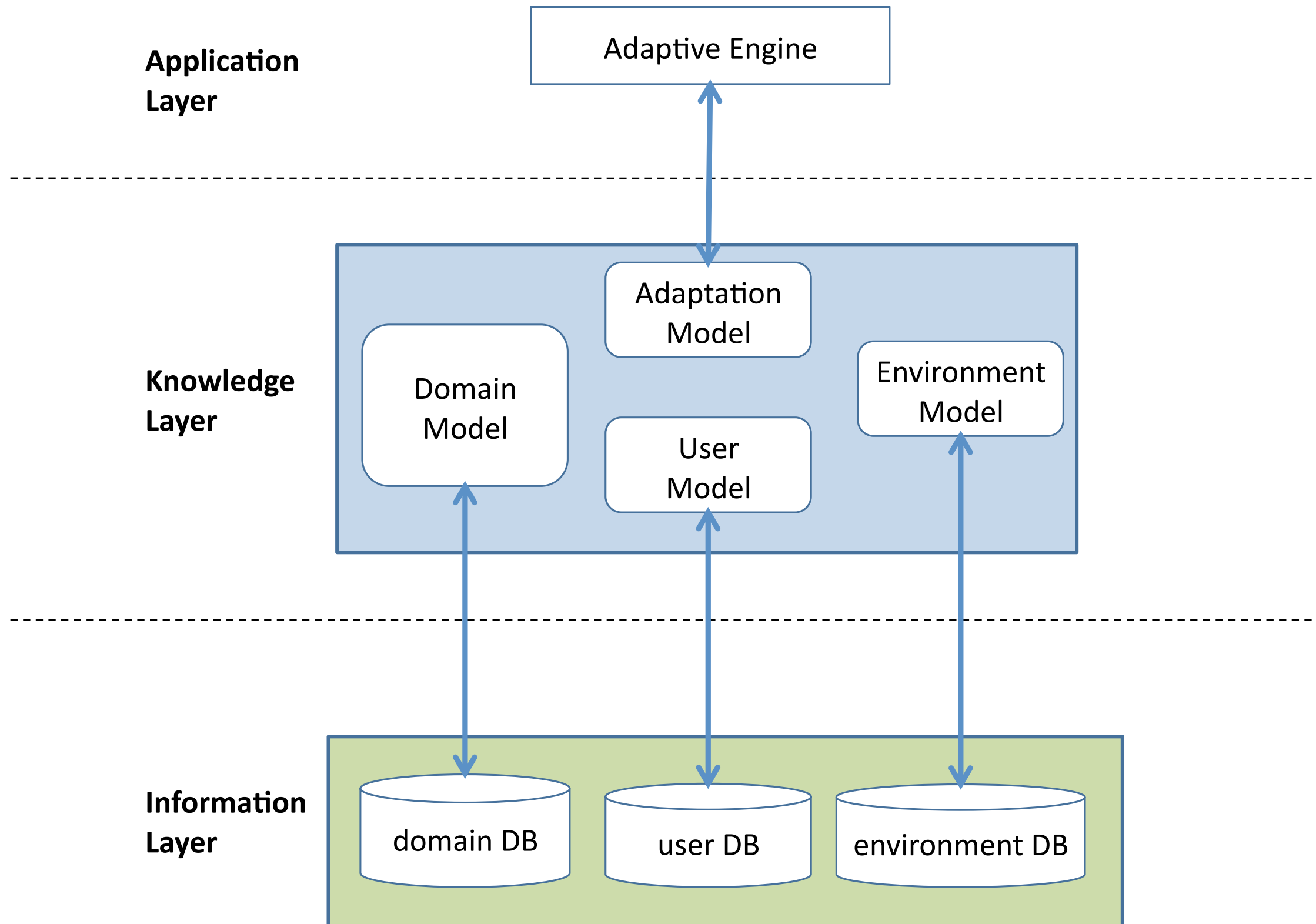
- ▶ all the **school** teachers, heads of schools, education stake-holders, children (c.a **300**) and their parents from UK and Italy (c.a **30**) that participated in the studies for the analysis of the user requirements;
- ▶ the **TERENCE consortium** for discussions, joint work or material for this presentation;
- ▶ the **European Commission** that funded **TERENCE** through the Seventh Framework Programme for Research and Technological Development, Strategic Objective ICT-2009.4.2: **ICT: Technology-enhanced learning**. The contents of the presentation reflects only the authors' view and the European Commission is not liable for it;
- ▶ last but not least, our own children for they are the guinea pigs of all the **TERENCE's** activities... Thanks, **Alessio, Dario and Lorenzo!**

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Q U E S T I O N S ?

Usage Scenario

- ▶ Carol is a 9 year old poor comprehender. She plays with her Xbox **console 1 hour a day**; interactive videogames interest her more than reading books of stories.
- ▶ Going through their long sentences that make no sense to her is **frustrating**! Still, **mom** expects Carol to understand them all...



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- ▶ However, **TERENCE** tells her stories in a video-game like environment. Her **teacher set it** for her at school. Now, Carol is at home and wants to use it by herself.
- ▶ She lives in a big town and likes fantasy books that have children as protagonists. She chooses such a **book of stories** in TERENCE and Layla as **avatar**. The **spatial map** of the book shows Carol the location of the first story. Carol starts reading this, and playing with its **smart games**...

