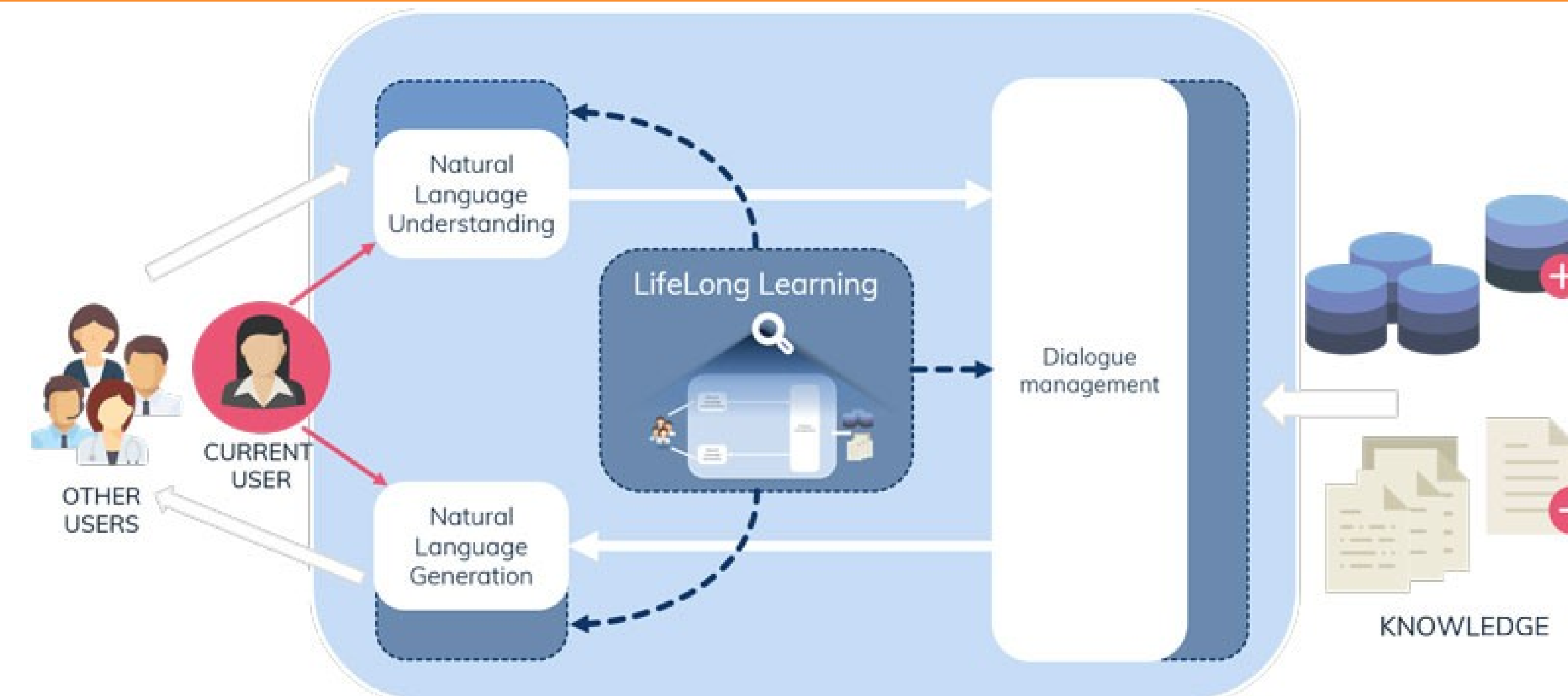


**LIHLITH** introduces a new **lifelong learning** framework for the interaction of humans and machines on specific domains with the aim of **improving the quality of existing dialogue systems** and **lowering the cost of deployment in new domains**



### Key ideas

- > Focus on goal-driven question-answering dialogue
- > Learn continuously from the dialogues
- > Dialogues designed to get feedback from the user:
  - User: *What temperature for my oven?*
  - System: *I don't know. Can you give me an example of accurate answer?*
  - User: *210C or 370 degree F*
  - System: *I found "Place the bird in a roasting pan, into a preheated 350*
- > All modules will learn from the feedback down in the pipeline

A

### Survey: evaluation methods for dialogue systems

- > Methods and concepts for the evaluation of dialogue systems
- > Task-oriented dialogue systems, conversational dialogues systems, question-answering dialogue systems

A

### Collection of dialogues

GOOGLE  
AWARD

- > Amazon Mechanical Turk interface to collect dialogues
  - » Worker1: ask questions about a cooking topic
  - » Worker2: answer these questions selecting a span of text presented to them
- > StackExchange community question answering forum – cooking
- > ~1700 dialogues: 8195 questions, 7744 answers

**Q:** How long can you keep chocolate, and what is the best way to store it?  
**A:** Regardless of type, all chocolate should be stored in a cool and low humidity (dry) place away from direct sunlight.  
**Q:** How long does chocolate last before losing flavor?  
**A:** Dark chocolate will last for years. Milk and white chocolate will last for a much shorter time (a few months), because of their milk content.  
**Q:** Once it gets that white stuff on the outside, is it done?  
**A:** No, This kind of chocolate is still suitable for any application where the chocolate will be fully melted (most baking)

### 1<sup>st</sup> year significant results

- A - Evaluation of dialogue systems
- B - Knowledge induction system
- C - Question answering system
  - » Structured QA
  - » Text QA
- D - Dialogue system
- E - Workshop on LL and dialogue

### 2<sup>nd</sup> year goals

- > Evaluation frameworks
- > LL for KI and QA
- > LL for dialogue

C

### Demo: question answering system

- > Subset of an industrial chatbot system
  - » Generate all the questions and answers that can be asked about the product or service from client documentation
  - » Question generation: manually defined rules
  - » Answers: excerpts of text
- > QA: question-to-question matching task

"You can reset your password by sending an email to admin@example.com"

How can I reset my password?

[Enumerative structure]

What are the steps for [subject of the primer]?"

D

### Demo: task-oriented dialogue system

<https://lihlith.limsi.fr/dialog.php>  
lihlith/recipe?

#### Scenario 1:

- > Find a recipe meeting a criteria
- > Database: 1,064 recipes from Wikipedia:Cookbok

#### Scenario 2:

- > Ask a question relative to the cooking domain
- > Unstructured data: 784 non-recipe documents from Wikipedia:Cookbok

SYSTEM> Hello, Are you hungry?  
 YOU> I want to cook a chocolate mousse  
 SYSTEM> 3 recipes correspond to your search, including : atkins-friendly chocolate mousse , chocolate mousse cake (vegan) and chocolate mousse . Which one do you want?

B

### Demo: generating triples of knowledge from a text

<http://nlp.uned.es/lihlith-project/ki/>

"John W. Carr (...) was a North Dakota Republican Party politician who served as the 15th Lieutenant Governor of North Dakota under Governor George F. Shafer."

