

A Virtual Selling Agent which is Proactive and Adaptive: Demonstration

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Abstract In this demonstration, we bring the online selling process closer to the customer experience in a retailing store. For this purpose, we demonstrate a virtual selling agent that is proactive and adaptive. Our proactive dialogical agent initiates the dialogue and drives the inquiring process for collecting information in order to make relevant proposals. Moreover, we will see that our virtual seller is adaptive since she is able to adjust her behaviour according to the buyer profile.

Proactive Dialogical Agent

We demonstrate here a virtual selling agent that behaves as an adviser in an online selling process. Our **proactive dialogical agent** (PDA) is detailed in a companion paper within the same proceedings [1].

Walk-Through Example. A buyer is surfing on the website of a sport reseller. He is looking for a bike for his daughter (i.e. the user needs). Since he does not find the appropriate product, he spends some times on the website and so the virtual seller agent is triggered. Then, the dialogue presented in Fig. 1 occurs.

This specific case run illustrates the main features exhibited by the virtual seller:

- **Initiative.** The virtual seller agent has initiative since she starts the conversation in order to support the customer (cf utterance #1).
- **Adaptability.** The agent reaction depends on the utterance #2. If the customer would reply that he has a limited budget, the following of the dialogue should be different. For instance, we would propose a special offer. Actually, the marketing strategy (i.e. the agent behaviour) depends on the buyer profile.

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1. PDA: Do you have any idea about the kind of bike you are looking for ?
2. Customer: Not at all.
3. PDA: Who will use this bike ?
4. Customer: A girl.
5. PDA: How old ?
6. Customer: 4.
7. PDA: May I suggest the 16" PRINCESS.
8. Customer: No, thanks.
9. PDA: Do you prefer the 16" CAM&LITI?
10. Customer: For sure.

Fig. 1 Proactive Dialogical Agent Vs. User: a Sale Scenario

- **Information-seeking.** The agent asks questions to the customer for collecting information in order to propose relevant products. The question in Fig. 3 allows to identify the buyer profile.

User Interface. The dialogue does not take place in a natural language but with the help of a classical web form (cf. Fig. 2) where the user has the choice between several predefined answers for each question asked by the software agent. The user interface is written with AJAX technologies. For this purpose, we have defined a specific XML-based language describing the query/inform (cf Fig. 3).

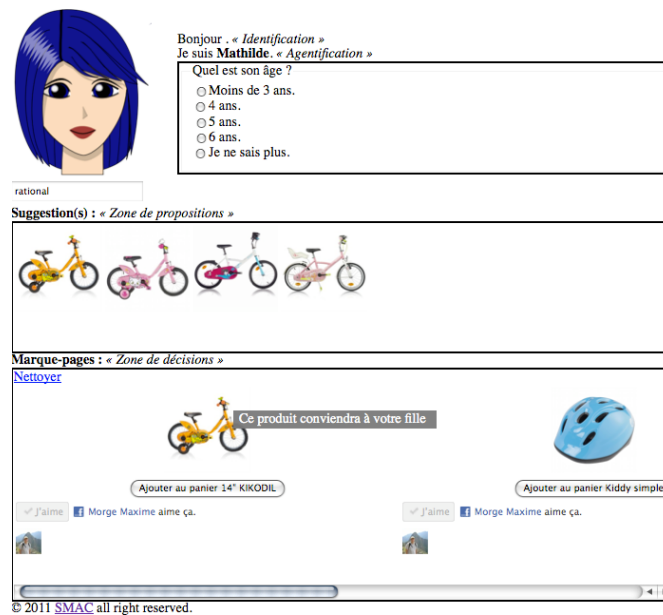


Fig. 2 Web interface of the dialogue

Multiagent technology. The PDA agent is deployed on the server side with a prototype agent platform written in Java which can support interaction between the Customer agent and the PDA agent. The reasoning of the latter is performed by using the rule engine Drools Expert¹.

Knowledge Engineering. For each specific case, the following data must be setup with the help of the retailing company:

- the product database containing the description of potential proposals;
- the knowledge base, i.e. the domain-specific information at the semantic level;
- the agent behaviour, i.e. the marketing strategy of the retailing company;
- the natural language query/inform (cf Fig. 3).

```

1 <?xml version="1.0" encoding="UTF-8" ?>
2 <questionAnswer>
3 <question>
4 <nlQuestion>Do you have any idea about the kind of bike you are looking for?
5 </nlQuestion>
6 <object>Buyer</object>
7 <attributeName>profile</attributeName>
8 </question>
9 <answers>
10 <answer>
11 <nlAnswer>Yes, I have a budget.</nlAnswer>
12 <attributeValue>bargain</attributeValue>
13 </answer>
14 <answer>
15 <nlAnswer>Yes, I know the features of the products I am looking for.</nlAnswer>
16 <attributeValue>aficionados</attributeValue>
17 </answer>
18 <answer>
19 <nlAnswer>Not at all.</nlAnswer>
20 <attributeValue>rational</attributeValue>
21 </answer>
22 <answer>
23 <nlAnswer>I do not know.</nlAnswer>
24 <attributeValue>null</attributeValue>
25 </answer>
26 </answers>
27 </questionAnswer>

```

Fig. 3 XML data for the question #1 and its 5 possible answers. We restrict ourselves such that each query/inform schema is associated with the valuation of one attribute, here `Buyer.profile`

Agent architecture. Our architecture (Fig. 4) consists of 4 layers:

- the **communication layer** specifies the moves which can be received/sent during the conversation ;
- the **dialogue layer** specifies the protocols and how the PDA records the moves during the dialogues;
- the **strategic/behavioural layer** in which the PDA selects the prior goals and so she chooses the adequate strategy depending on the dialogue type;

¹ <http://www.jboss.org/drools>

- the **reasoning layer** in which the PDA performs forward chaining with the rules in order to entail new beliefs.

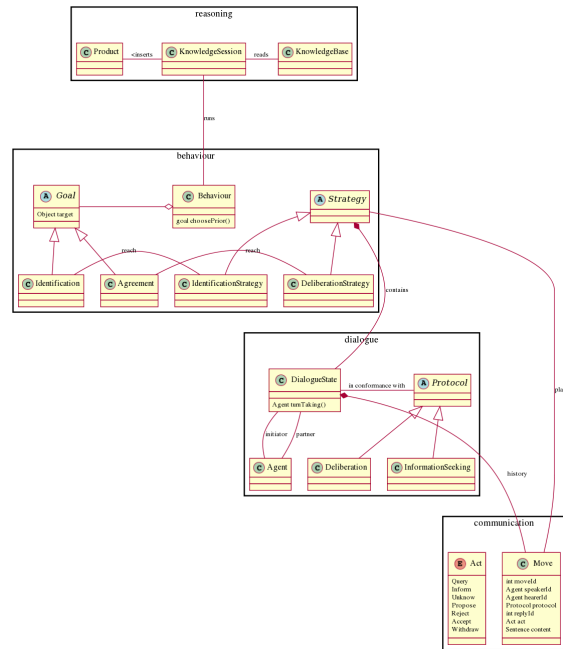


Fig. 4 The PDA agent architecture

Work-in-progress Our proposal has been validated by some experts and researchers in marketing who are quite enthusiastic with this approach. They aim at evaluating our proposal with a panel of buyers. For this purpose, we are populating our prototype with real world data from a retailing company (product database, knowledge base, marketing strategies and natural language query/inform).

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References

1. Delecroix, F., Morge, M., Routier, J.C.: A virtual selling agent which is proactive and adaptive. In: Proc. of the 10th International Conference on Practical Applications of Agents and Multi-Agent Systems (PAAMS), Advances in Intelligent and Soft-Computing. Springer, Salamanca (2012)