Bauhaus-Universität Weimar

CML:// **Match** Base
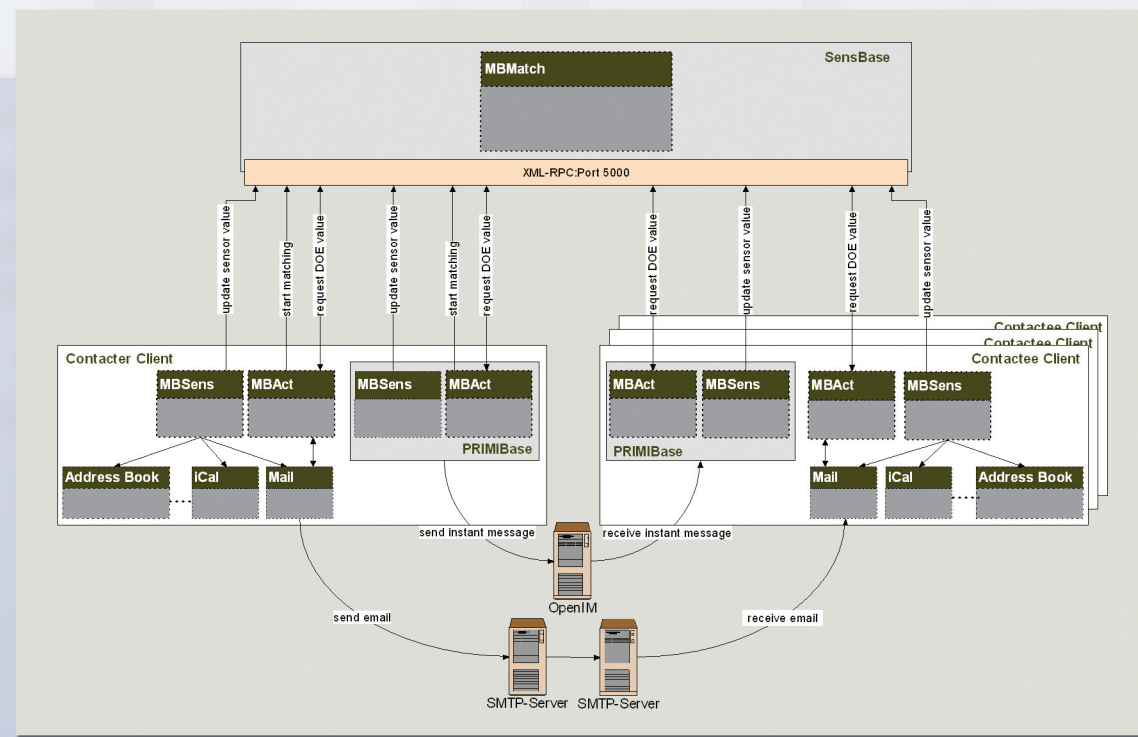## Development Suite for Context-Aware Communication

Figure 1. An overview of MatchBase system architecture. The figure shows the MatchBase suite with the MBSens, MBMatch and MBAct components and its interaction and communication.
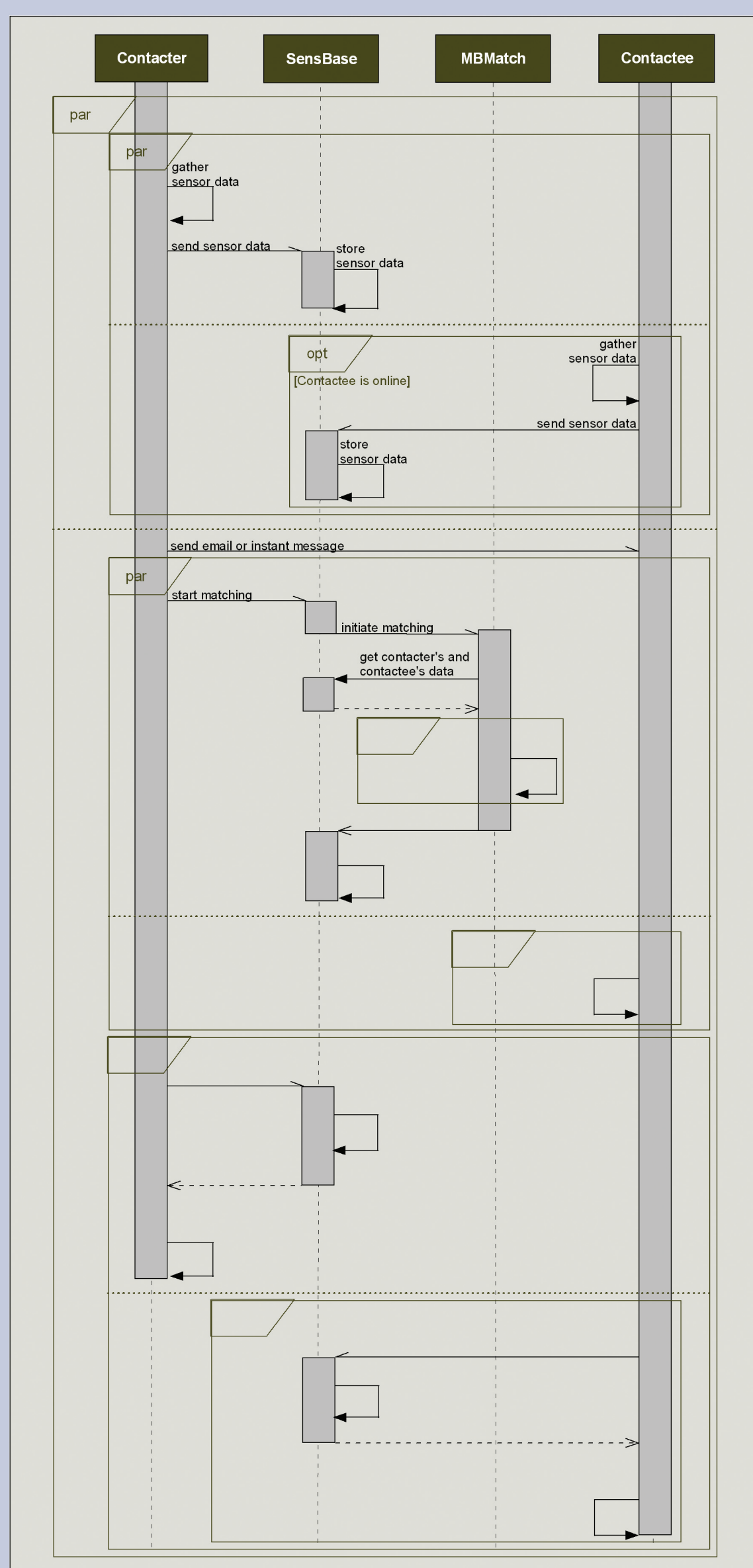

Figure 2. Overview of the system workflow. The figure shows the reaction of SensBase and MBMatch depending on user action.

MatchBase is a development **suite for efficient context-aware communication**. Context-aware communication aims to mediate communication between contacter and contactee according to their actual context, where the contacters' context refers to their current situation and their motivation to initiate the communication and where the contactees' context refers to their current situation and availability.

The **MatchBase suite** consists of: MBSens—a sensor component with various software and hardware sensors; MBMatch—an inference engine processing the captured information; and MBAct—an actuator component with various actuators that adapt the behaviour of the user's applications according to the inference results.

The MatchBase architecture was developed with the CML platforms Sens-ation and PRIMI. We use the SensBase reference implementation for communication handling and data storage. The PRIMIBase reference implementation is used as instant messenger. The architecture of the MatchBase suite is a client-server-model (cf. Figure 1). The client side consists of the MBSens and MBAct components. The **MBSens** components monitor several applications and continuously gather data about the user's context. For the contacter it is essential to determine the message's matter, type, importance, urgency, and complexity. On the contactee's side information about current task and workload are retrieved as well as obvious indicators (e.g., if the person is already having a conversation or a meeting). The gathered information is sent to the SensBase server via XML-RPC calls. The **MBAct** components control several communication applications. When the contacter initiates communication—for instance, sends an email or instant message—the MBAct components react on outgoing messages by notifying the server and MBMatch respectively.

The **MBMatch** component extracts all necessary information about the contacter, the contactee, and the message from the database and matches the preferences of both communication partners to determine the most efficient communication strategy. The matching component is fed with the respective information and calculates the Degree of Effectiveness (DOE). The DOE determines the further behaviour of the system: if the DOE is high, the MBAct actuators on the contactee's side deliver the message immediately; if the DOE is low the message is held back until the system detects an appropriate time for delivering it. The MBAct actuators on the contacter's side inform about the results of the message delivery (cf. Figure 3). An overview of the workflow of the system on an occurring interruption situation is shown in Figure 2.

Besides the development of the MatchBase suite two different approaches for efficient context-aware communication are studied. Both focus on the analysis of the contacter's context and preferences. In the first approach the necessary information is retrieved by a user query (cf. Figure 4). The second approach attempts to determine the contacter's preferences automatically via sensors. An user evaluation is done for comparison of both approaches.

For further information see:
http://cml.medien.uni-weimar.de

Prof. Dr. Tom Gross
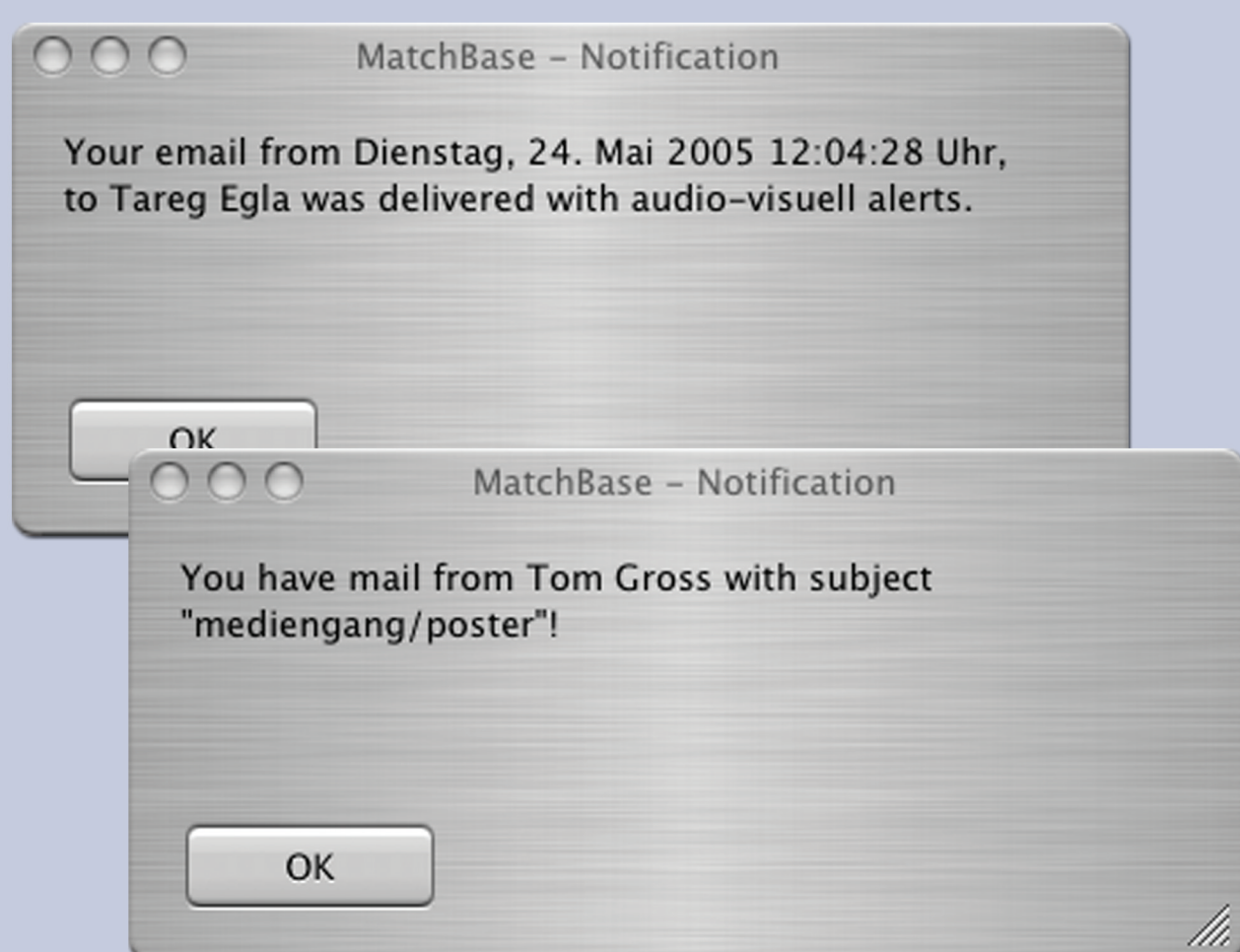
Simone Braun
Susanne Krause

Figure 3. Notification windows provide contacter and contactee information about the communication.
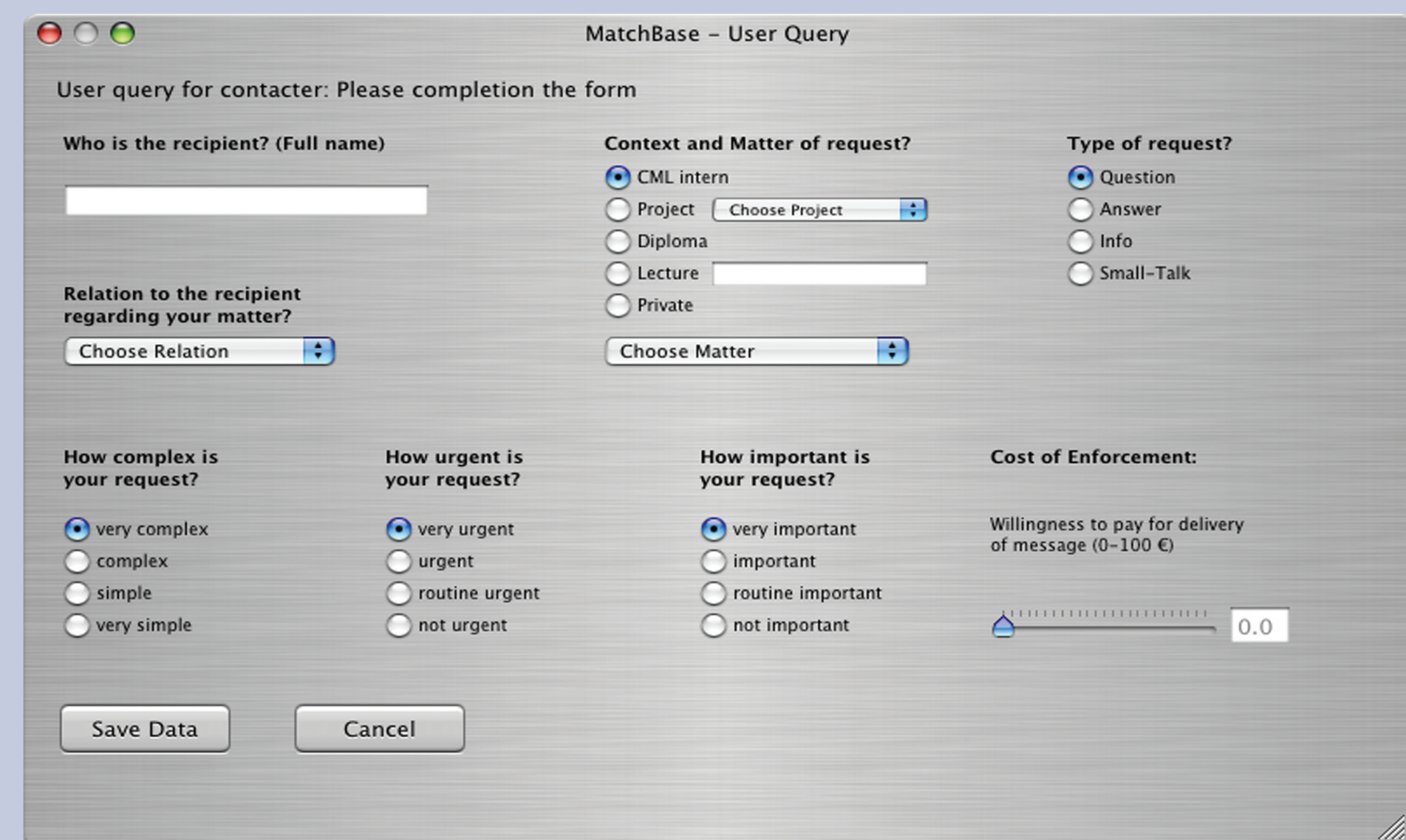

Figure 4. User query window. The window is displayed to request information about the communication in the user-driven approach when the user has sent a message.