



No caries – No pain

“No caries – No pain” was specified as part of the UbiCompForAll project in order to identify potential users of the technology that will be developed in the project and to generate design ideas for the services these users might compose.

Summary

Terje, a dentist in Trondheim, has composed “No caries – no pain”, a dental care advertisement service, in order to find a new customer short time before a free time slot in his time table. The service supports Terje in identifying vacancy in his time table, identifying potential customers and making an agreement with a new customer.

Problem description

Service providers wish their services to be fully booked, mainly for the sake of a good economy, but also for other reasons such as reputation. The dental care advertisement service addresses the problem of “last minute” advertisement for dentists. Dentists and other health-care providers frequently experience that patients do not meet to their appointments.

Main actor (s)

Terje (47), dentist down town and two of his customers Tora (21) and Truls (35).

Terje is an experienced and well-established dentist. He likes his occupation, and dislikes when customers do not meet to their appointment.

Activity scenario

Early morning, Terje enters the dental office, switches his computer on and activates the “No caries – No pain” service in order to send reminders to today’s patients. The patients are requested to confirm their appointments within one hour. After a long working experience, Terje knows that many patients have forgotten their appointments and among them some will not be able to meet. Therefore he has composed a service that supports him in identifying and advertising vacant work slots.

Tora had completely forgotten her yearly dental check today. She is busy reading lecture notes just one day before the end quarter exam in mathematics. She is not very found of mathematics, but everything is better than going to the dentist. She does not hesitate and immediately requests for cancellation of the appointment.

Upon reception of Tora’s cancellation, the “No caries – No pain” service posts a notification on Terje’s computer and immediately looks for a replacement for that patient. Tora’s appointment was planned early this morning, so if possible the new patient should be situated close to the office. Terje has specified the service such that the patient profiles, the list of nearest dental check appointments and possibly the patient location are taken into account when identifying a new patient. In the case of short notice, Terje also offers a discount on the dental check. After identification of potential new patients, the “No caries – No pain” service sends an invitation to the first patient of the list. Patients are requested to confirm the offer promptly (within ten minutes after reception of the invitation).



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Truls is off-duty this morning. While he is walking around in the city looking for good shopping opportunities, he receives an invitation from his dentist. 20% discount on a dental check, this is a good deal! He does not hesitate and confirms at once!

Upon reception of Truls's confirmation, the "No caries – No pain" service updates Terje's calendar and posts a notification on Terje's computer. The service looks for a vacant slot for a new appointment with Tora. Then the cancellation of today's appointment together with a new appointment is sent to Tora.

Alternative stories

Terje may compose different variants of the service:

- Reminders might be sent to patients at different times: one week before the appointment, one day before or the same day. This might depend on the patient needs or earlier experience with that patient.
- The information used for the identification of a new patient may depend of the time left before the vacant time slot. Using patients' location makes sense when one hour before vacant time slot is left, not when on day is left.
- Instead of sending an advertisement to a single patient (from a list), advertisement may be sent simultaneously to several patients following the "first come, first serve" principle.
- The service might first questions Terje whether he wishes or not to fill up the vacant time slots.
- In the case no replacement for Tora is found, Tora has to pay a fee. The "No caries – No pain" service may either submit an electronic invoice or initiates a credit card transaction.

Properties

Several alternative behaviours are possible that makes the service of interest from a composition viewpoint. Also the same kind of service might be applied to the advertisement of different kinds of products and services allowing us to create building blocks that can be reused for various advertisement purposes.

The service "No caries- No pain" as described in the scenario is quite complex. However the service might be built incrementally. For example, Terje might first compose a simple service for sending advertisements to a set of persons who he selects from a list. When he gets more experience in using the composition tools, he might add support for identifying new customers automatically. In that way, he might gradually learn new features of the composition tools.

From a technical viewpoint, the composition of this service allows us to investigate various forms of composition constructs such as activity sequences, choices and even loops. We are aware that the latter might be too complex for non-professional SW developers.

External evaluation

This scenario has not been evaluated yet.



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Related scenarios

The advertisement scenario might be applied for advertising different kinds of products and services. We have described two other scenarios:

- “Easy announce and book”, the advertisement of vacant concert seats by a booking office
- “Tickets for sale!”, the advertisement of unused tickets by a private person.

More details

In the following, we provide an informal specification of the service. The purpose is to identify potential building blocks in the service. It is not to define a notation that will be provided to the users of UbiCompForAll composition tools. **The notation used below is probably far too complex for non-professional SW developers.**

We have chosen to use activity diagrams to specify a composition as the composition of activities is quite close to the way of describing the steps of a scenario: “We do this first, then this, then...”. For each activity, the actors involved in the activity and the collaborations between the actors are shown. In each activity, a goal might be achieved. Goals are indicated as exit points, and can be used to control a choice in a composition sequence.

We assume that some the components exist and are reused by the user who composes the service. Also the collaborations towards these components are well-defined. We have chosen to highlight in **green** the entities that support the service logic that the user wishes to specify. If the actor “search manager” marked in **yellow** does not exist, he should also create it.

Figure 1 shows a first composition for the No caries – No pain. The composition follows the main scenario steps, i.e. identifying vacancy, identifying a new patient, takes place sequentially.

Although the service is mainly built of a sequence of activities, we also have to:

- Specify choices. For example, a patient might confirm or ask for cancellation of an appointment. In the first case, the next patient is considered, in the latter the free time slot is advertised.
- Specify loops. As several appointments are defined or several patients may be sent advertisements, activities are repeated for each appointment and each potential new patient. This considerably increases the complexity of the composition. The composition has to be checked to ensure that no undesirable perpetual cycle is introduced.

Simplification: Because we do not use any modelling tool for specifying this composition, we have omitted to describe the last steps in the composition, i.e. finding a new appointment for the patient who cancelled.

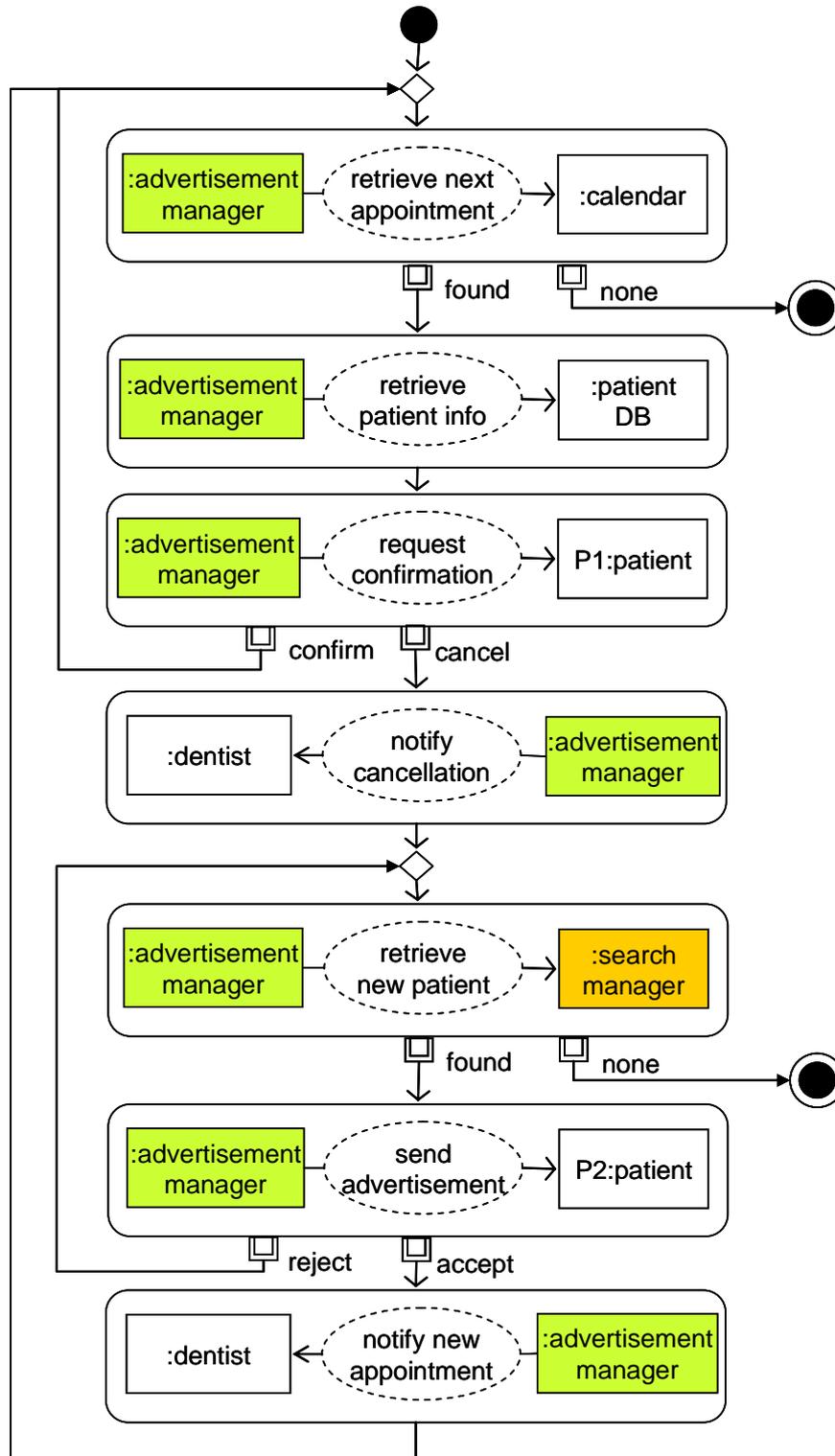


Figure 1 - A simple advertisement service

Incremental composition: sub-services

When working with this specification, we found out that the sequence of activities grew rapidly... Adopting a compositional approach might be a good idea, even for simple services. We have therefore decided to specify sub-services that can themselves be composed. Sub-services are specified by composing building blocks in the same way as the composition of the main service.

For example as shown in Figure 2 and Figure 3, two sub-services are created. These sub-services are reused when composing the advertisement whole service, see Figure 4.

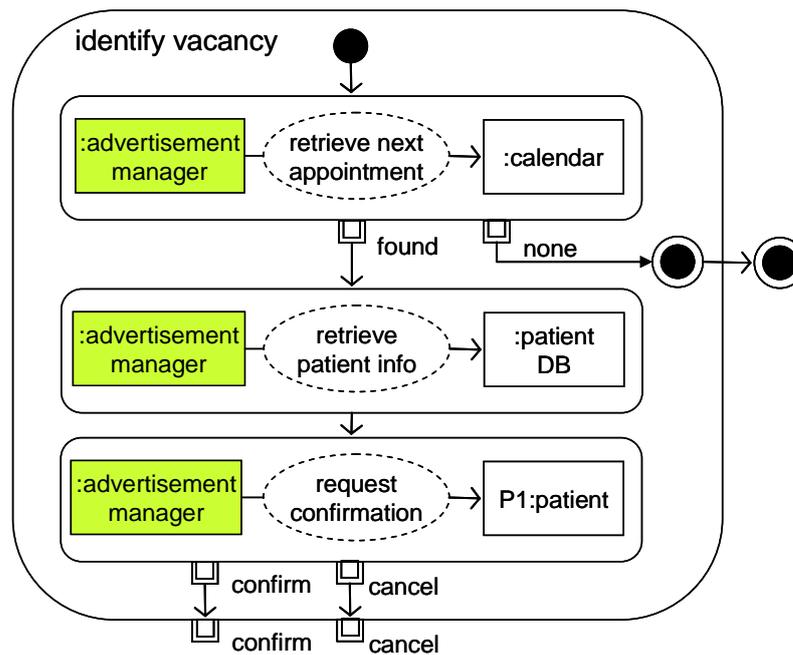


Figure 2 - A sub-service for identifying vacancy

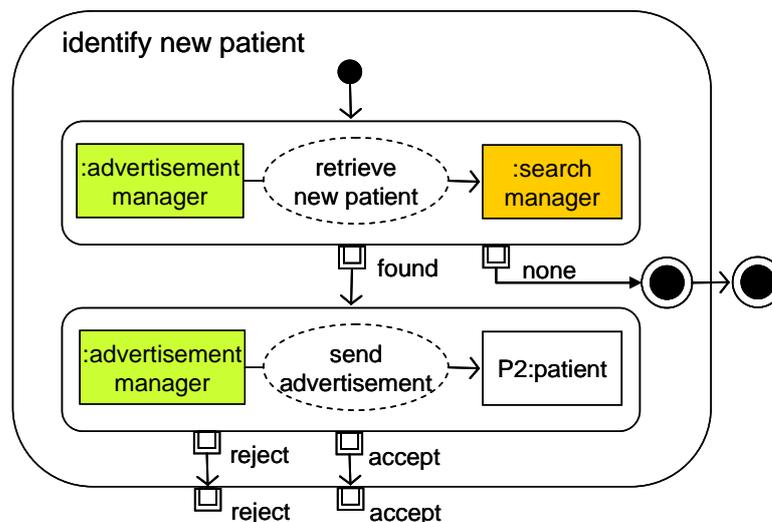


Figure 3 - A sub-service for identifying a new patient

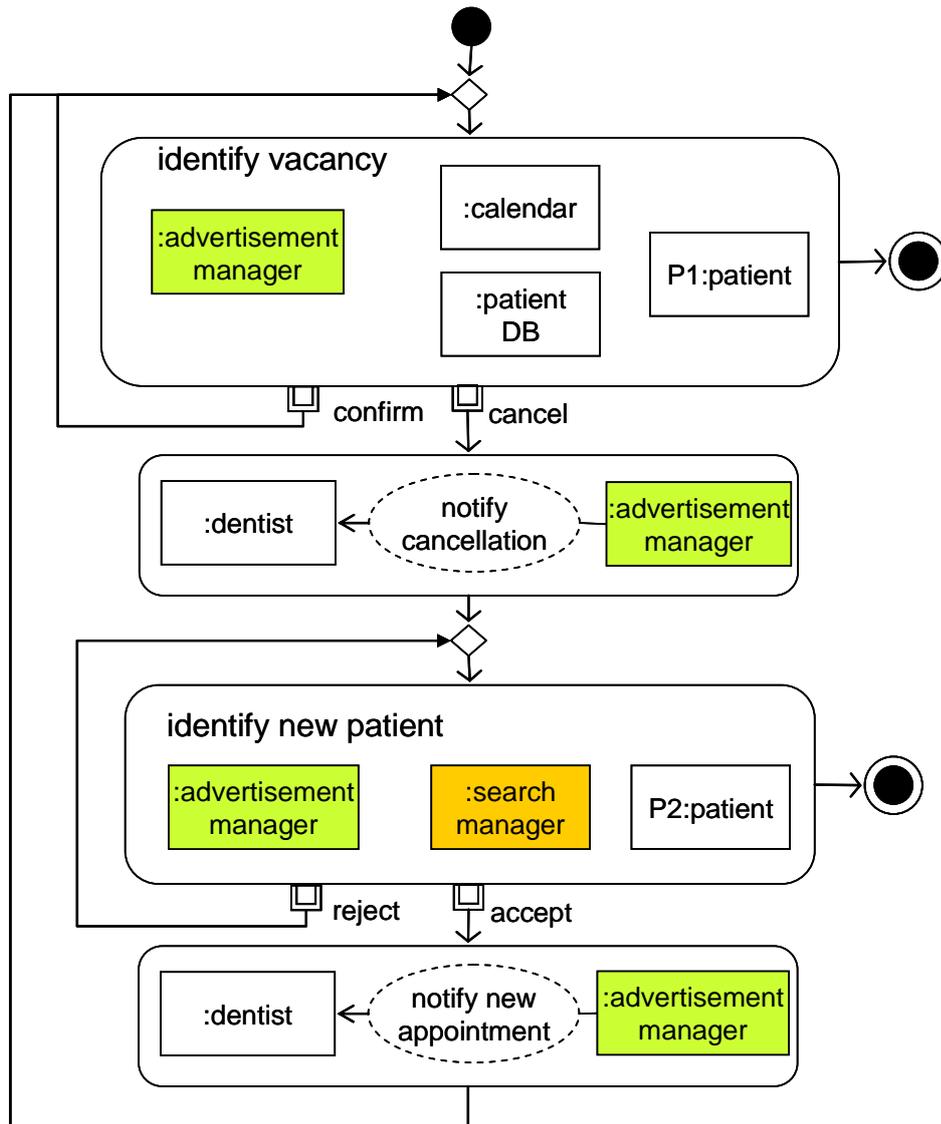


Figure 4 - Using sub-services in a composition