



“Multimedia assistant” 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

Ove creates a service to help his mother watch TV and access other entertainment. It lets him schedule TV shows for Oda to watch. It also incorporates radio, and music and video files, and provides a simple user interface for Oda to access it all. It builds on the “Doctor's appointment” scenario.

Problem description

Oda is finding it harder and harder to watch TV. She has remote controls for her TV set, a digital TV receiver and a DVD player, and finds it confusing to use them all. She is also getting forgetful, and sometimes forgets her favourite shows. She has to call Ove for assistance with the remotes, and he has to call her to remind her of the shows she wants to watch. And Ove knows it will get harder for her as she gets older. Inspired by the appointment manager he made for his mother, Ove wants to compose a system to make it easy for her to access all sorts of media.

Main actor (s)

Oda (75) is starting to get forgetful, but she is still able to get around on her own. She has a mobile phone, and can call and receive messages with it, but doesn't send messages.

Ove (47) is Oda's son. He wants to provide assistance for his mother, but he is also very busy with his work. He is accustomed to using computers in his daily life, but in no way an IT professional.

Activity scenario

Ove logs on to the TV guide he uses to schedule TV shows for his mother. He has already scheduled her regular shows. He browses through the program guide, to see if there's anything else of interest. He finds a program he thinks she would like to watch, and selects it for entry into his mother's calendar.

Oda turns on her TV screen. It gets its picture from the computer in her house running the services Ove has composed for her, which is always running. It shows a menu with large icons and text in a large font. Oda has a single remote control to control it. She selects her calendar, to see what has been planned for this evening. There's nothing planned in the immediate future, so back at the menu Oda chooses to listen to music. This brings up a menu of playlists Ove has created. She selects one, and the music plays.

Then Oda remembers there might be a recorded TV program she hasn't watched yet. So she brings up the main menu again and selects recorded content. One entry in the list is marked as unwatched; it was aired late last night after she went to bed. Ove had selected it for recording. She watches it.

After it's over Oda is returned to the main menu, and decides she wants to listen to the radio. She gets a list of the channels she likes, and selects one. She listens to this for a while. Then a message pops up on her screen, with a sound to notify her. It contains the title of a TV show she



likes, telling her it's starting now and asking if she would like to watch it. She selects the "Yes" response, and the system switches from the radio to the TV, where the show is about to start. After it's done she turns off the TV, as it is getting late.

Composition scenario

The need for the service arises because Oda is finding it hard to keep track of the various remote controls she has for watching TV and movies, and because her son Ove wants to make it easier for him to remind her of when there's something on TV she would like to see. He wants to make it easy for her to access various media, and send her music and playlists to listen to.

Ove composes the service on behalf of Oda and himself; she is the main user of the service but he also has roles in its use. He composes it on his home computer. He has experience from composing a service to assist Oda get to her doctor's appointments. His experience with the composition system has been positive, and he feels ready to compose another service. A search in the online component database turns up a video player, a music player, an internet radio player, and a TV viewer and TV recorder for watching TV on a computer with an appropriate TV receiver card. He also finds a TV program guide which can be used to select programs.

This service differs from Ove's previous composition in that it needs a composed user interface to provide a uniform interface for Oda to use a number of components. So the new task for Ove to learn is user interface composition. There are four components he wants his mother to use in the first version, for TV, radio, music and video. Being available for composition, each component comes with an abstract user interface specification, defining inputs and outputs. The interfaces are represented graphically in the composition software, and Ove can choose to remove some of their parts to keep them as simple as possible for his mother. In addition he must make a main menu for selecting each of the four components. The composition software lets him do this easily from a palette of user interface elements.

The resulting abstract interface specification is deployed to the computer in Oda's home along with the media components. As part of the deployment Ove selects a user interface implementation from several possible implementations available for the PC. This controls how the user interface ends up looking and working. He selects an implementation made for a TV screen as output and a remote control as input, where the elements are large, simple and user-friendly. From the previous service Oda already has a computer connected to the TV. Ove gets a remote control for it and a TV card which lets it receive TV signals. He also gets a large hard-drive to store video, and copies Oda's DVDs to it. Then she is ready to use her new multi-media system.

For scheduling Ove will use the TV guide enabler. When Ove logs into it and selects shows to watch, it provides output with the necessary date, time and channel info. Ove connects this to Oda's calendar. The calendar will send out an alert shortly before the show starts, and Ove connects this to a dialog component that lets him specify a question and choices for Oda. Based on the response, it can switch on the TV component and right channel. Ove also adds the recorder component to record the show if Oda prefers this option, or the dialog times out.

Finally Ove makes some additions to his composition. He adds a calendar component showing scheduled appointments for the day or week and integrates this with the media components in Oda's menu, so she can look at her schedule if she wants. He adds a messaging client that lets him enter and send messages to Oda's screen. The music player is configured to present playlists found on the local harddrive, so Ove will use a file uploader to put music and playlist files on Oda's machine.



Like in the “Doctor's appointment” scenario, the service can be modified when Oda's needs change, or when new useful components and services become available. More media components can be added, like a photo viewer for Oda to view digital albums managed by Ove. If Oda’s cognitive abilities deteriorate she might need Ove or the system to be more in charge of what to show.

Alternative stories

- If Oda was enjoying listening to the radio when the notification about her show came up, she could choose to have it recorded so she could watch it later instead. If the TV is not on when a scheduled show starts, the screen will come on and show the notification message, playing a sound to notify Oda. If she is not available to make a decision, leaving the notification unanswered until the show starts, the show is automatically recorded.
- Ove has transferred Oda's DVDs to the hard-drive of her computer, and she can choose to watch them from her menu whenever she wants.
- So far Oda is able to use a remote control to make selections on the screen, and Ove has composed the system to ask her if she wants to watch it when a show comes on. He wants her to be active and make decisions for herself, but as she gets older she might find this harder. The system could instead be set up to automatically show scheduled shows, and also to play music or stored video content when there are no scheduled programs.
- A client could be made for Oda’s phone, giving her notifications on it and letting her decide to record shows from it. It could also be used as a remote for controlling her computer/TV, so she wouldn’t need a regular remote control; the phone would then be the only device she needs to use. But she might find it confusing to use her phone to control the TV.
- An option to let Oda use the TV guide to schedule TV programs herself could be added to her main menu, but the user interface of this component is probably not simple enough for Oda. The scheduling could be available to other relatives, not just Ove, so more people can help suggest shows for Oda.
- Ove has already created a service for managing Oda's appointments. The multimedia assistant should use the same calendar and messaging components. Care can be taken to integrate it with the existing service, such as using the knowledge that Oda is not home to automatically record scheduled media. It could all be considered parts of one big system that can be further expanded. All services Ove composes to aid his mother can share the calendar and event manager for coordination, so all the services can be planned in the same way. All services Oda has access to should be accessed in a coherent fashion, through the same menu system on her screen. So Ove can gradually include more services, and it will all be part of one assisted living system.

Properties

This scenario complements “Doctor's appointment” (DA) and exemplifies a different type of composition – while the first scenario looked at scheduling and the management of a sequence of tasks, Ove has now put together a media application for his mother – something Oda will interact with. For such a composition the system must handle user interfaces. User interfaces is of special importance when composing a service for the elderly. Oda needs a simple and user-friendly interface, and ideally it should have a common look and feel for all features. The need for a common interface for a composed system is an important property of this scenario.



User interfaces could be handled in different ways. Each component, such as the various media players, could have its own interface, and the composition could include ways for the user to switch between these. But the resulting service would have a non-uniform interface, which could be confusing for Oda. And we would lack the ability to tailor the interface to different devices and user needs. The obvious alternative is for the composition to let Ove create a user interface for the functions provided by the components. But this would make composition a very big and difficult task. The solution we have outlined here, is for a component to come with an abstract specification of its interface. The user interface must then be implemented when the service is deployed, based on the specification. This could be done differently on different devices and based on user preferences and needs. So the same composition could be deployed on a PC and cellphone, with a native look on each, and also look different on the same device for Oda and a younger user. Another advantage is that the specification can be manipulated in a user-friendly way by the composer, to integrate the controls of different components.

As in the DA scenario, we have a distributed service, consisting of different parts running on different machines, and two different user roles. We have scheduling, but it is simple enough to only need a calendar. We have user input to control flow.

Aside from the user interface concerns, it is a quite simple composition if we consider it in isolation. It becomes more interesting, and also much more complex, if we want to be able to integrate these components with a larger assisted living system, where everything is controlled by the same planner and all registered events could possibly affect planned events and running components. It would then share the basic features of DA, with scheduling, events and messaging. I think the integration of different services, with the ability for coordination and a common interface, is something that would make composition truly powerful and useful.

External evaluation

The scenario has been evaluated at the Norwegian Centre for Dementia Research. The following is a summary of the comments: It's important to know why Oda is finding it harder to watch TV, and adapt the solution to her needs. Problem factors can be eyesight, concentration, interest/initiative, turning on/using the TV and time/remembering when a show starts. She might find it hard to use a remote control. Choosing text from a list can be difficult – then icons should be used. Use of the phone to control the TV is probably not a good idea. People with cognitive impairment find it difficult to use items in new ways.

Oda's interface needs to be kept simple. She would probably not want to use the program guide herself. Scheduling programs to watch later requires some work, and if she is able to do this then she is also able to turn them on when they air, which is simpler. Another thing to note is that people who's memory is starting to fail don't like to leave the main menu/start page of a service, and a solution is to bring it back automatically after a time.

Related scenarios

- Doctor's appointment