

Mobile and Ubiquitous Computing assignment 3

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1a)

Schilit et al categorize context-aware computing applications using a two-dimensional matrix. The four resulting categories represent the four corners of this matrix:

- *proximate selection*: this category contains applications gathering and emphasizing information and services which are close to the user (e.g. selecting a remote display in the same room or a printer close by). In Dey's scheme this corresponds to applications supporting "presentation of information and services to a user".
- *automatic contextual reconfiguration*: the process of adapting to the current context by changing the configuration, adding or removing components, loading device drivers for newly discovered devices (e.g. automatically connecting to a room's network and printers) or sharing virtual objects during the meeting of a workgroup. Dey describes these types of applications as "automatic execution of a service for a user".
- *contextual information & commands*: Contextual information is based on the typical behaviour in an explicit location and should show the user useful information. This can include a shared filesystem dependant on the location: it displays notes and information another user has left in this room. Larger screens displaying useful information for users close by also belong to this category. Dey summarizes most of these applications as "tagging of content to information to support later retrieval".
- *context triggered actions*: a user often wants to trigger the same task every time he enters or leaves a certain context. These rules can be formulated as simple if then conditions starting a task when satisfied. The text mentions playing a sound when coffee is ready or displaying a user's working environment on a screen in the current room, when pressing a button. In Dey's scheme this class of applications also falls under the "automatic execution of a service for a user".

The combination of two of the categories proposed by Schilit et al makes sense, as the automatic contextual reconfiguration often requires some context triggered actions. Also reconfiguring on every change of context might confuse users, so this reconfiguration should only occur if it is relevant for the task at hand (following Dey's definition of context-awareness, reconfiguring the printer driver every time the user enters a new room is not necessary, if the user is currently watching a video file).

b)

Dey criticizes previous attempts to define context and context-aware applications as hard to apply or use. The main reason is the use of either examples or synonyms in the definitions which cannot be translated to completely new

situations. Often these definitions are also too specific, as they list a set of properties which are considered as the context. In his definition of context however, this set of properties is not constant, as it includes all “relevant” (where “relevant” depends on the current task) information to be considered part of the context. This generalized definition of context and context-awareness was chosen to include all existing context-aware applications; applying previous definitions never fitted all of them.

c)

Brown et al see classification of context-aware applications as not feasible, as they “blur into other kinds of applications”. They see context-aware applications as mainly mobile applications driven by context. The main application areas are directly derived from the ones proposed Schilit's paper one the one end (many small and simple applications just triggering on and processing context information) and a proposed brain prothesis on the other (one big and ambitious application). The only possible distinctive types of context-aware applications they see are continuous and discrete ones (with all possible mixtures in between). Continuous Applications constantly change their state and update their display, whereas discrete ones only react to some discrete changes like changing the room.

Source:

BROWN, Peter J.; BOVEY, John D.; CHEN, Xian. Context-aware applications: from the laboratory to the marketplace. Personal Communications, IEEE, 1997, 4. Jg., Nr. 5, S. 58-64.

Harter et al defines context-aware applications as follows: An application that “adapts its behaviour to a changing environment” with the special case of follow-me applications that follow the user as he moves from room to room, or applications that build themselves up from devices in the proximity.

Source:

HARTER, Andy, et al. The Anatomy of a Context-Aware Application.