Abstract. We live in a world of continuous information overflow, but the quality of information and communication is suffering. Single value devices contribute to information and communication quality by focussing on one explicit, relevant piece of information. The information is decoupled from a computer and represented in an object, integrated into daily life.

The contribution of this paper is on different levels: Firstly, we identify single value devices as a class, and, secondly, illustrate it through examples in a survey. Thirdly, we collect characterizations of single value devices into a taxonomy. The taxonomy also provides a collection of design choices that allow one to more easily find new combinations or alternatives, and that facilitate the design of new, meaningful, effective and working objects. Finally, when we want to step from experimental examples to commercializable products, a number of issues become relevant that are identified and discussed in the remainder of this paper.

1 Introduction

After the quantity explosion of information and communication, the desire for quality arises, as also expressed by the slow media movement [19]. Single value devices are objects that filter one item out of the constant cloud of information, and display it in isolation on a physical object, making this information much more accessible and prominent and integrating it in our daily lives. These key properties give single value devices the potential to increase the quality of information.

A single value can carry a huge amount of information. The single bit of information that a friend is online on ICQ creates an awareness of the other person, an emotion of sharing presence and activity, and may suggest an action, which is to contact the friend. Embodying the representation in a dedicated (everyday, or especially designed) object has additional advantages. Firstly, it brings more immediacy to the information, compared with opening a laptop, connecting to the internet and searching for the information. Secondly, dedicated objects allow for an almost unlimited variety of designs to represent the information and interact with the user, such as sound, touch, light, movement, whatever can be invented using actuators and sensors, and what people find easy and pleasant to perceive. As we will discuss later, it also gives more possibilities to design for emotion. Finally, dedicated objects, more than traditional screen-based devices, allow the technology and the information representation to move into the
background or periphery. The information comes only into focus when needed, and the user is not overburdened with information (cf. ubiquitous computing and calm technology [29,30,27]).

Most existing single value devices come from conceptual experiments and from art and exist only as prototypes. In order to get to mature products and to design meaningful, effective and working objects, an understanding of the design choices and their consequences is necessary, which is the core contribution of this paper. Our fundamental question is: How to design meaningful and effective single value devices? We will, first, approach this question by investigating the possible characteristics of single value devices. To this end, we present a survey of existing single value devices in Section 2; subsequently, we suggest a taxonomy for single value devices in Section 3. When taking the step from the proof-of-concept or artistic-exploration nature of most existing single value devices to commercially feasible products, a number of design issues becomes relevant, which are discussed in Section 4.

2 Survey of Single Value Devices

In this section we present a chronological survey of single value displays, in order to unfold the space of possible applications and approaches. The objects presented here are often prototypes and results from art projects.

- *Feather*, *Scent* and *Shaker* [23] are pairs of objects shared by two people. In “Feather” and “Scent”, one partner has a picture frame, and shows (s)he thinks of the other by shaking the frame. This message of connectedness is communicated to the partner at home in a manner reflecting the transience of thought: through a feather in a cylinder that is lifted by a little fan, or by vaporising essential oil in an aluminium bowl using a heating element. “Shaker” is meant for less intimate friends, and consists of a pair of handsized devices that, when shaken, cause a vibration of the other object.

- The *Dangling String* [30] is an installation for an office environment. It consists of one and a half meter of plastic spaghetti hanging from the ceiling, mounted to a small electric motor. The motor is triggered by the activity on an Ethernet cable. A very busy network causes a madly whirling string with a characteristic noise; a quiet network causes only a small twitch every few seconds. Placed in an unused corner of a hallway, the long string is visible and audible from many offices without being obtrusive.

- The level of web activity is displayed in [18] using ripples in a water tank. A solenoid-driven float triggered by “bits” of web activity creates ripples on the surface of the water; these are reflected on the ceiling using a strong light.

- Also for a working environment is the light installation of [15]. Posters of research projects on the corridor walls are illuminated by spotlights. The light intensity of each spot is determined by the number of hits on the corresponding project webpage over a period of time.

- The *Peek-A-Boo Surrogate*, as one of many examples in [16], is also for a working environment. It consists of a little figure that turns its face to the wall if the