

# Chapter 1

## Interaction

*Interaction* is a core element of any digital design – or design of “the digital”. Interaction provides us with the tools and ways of using, manipulating, changing and developing digital material. While interactivity deals with a specific character of digital technology as a dynamic material, interaction also includes the human in the loop, i.e. the interaction with digital technology as an interactive material. In international research areas like Human-Computer Interaction (HCI), or Interaction Design (IXD) we can notice that interaction is a core aspect of the object of study. Still, most research conducted in these areas are concerned with either human factors or design of computer support in HCI or “Design” as a specific approach to IT in the field of Interaction Design. Similarly, in sub areas of research like “Mobile Interaction Design”, or “Social Interaction Design” the focal object of study is “mobility” or “social behaviors” rather than a focus on the character of interaction *per se*.

In this first chapter I specifically set out to elaborate on the notion of *interaction* as a fundamental concept for understanding the current development of IT-use as a movement from desktop computing to *everyware* (Greenfield, 2006) including the movement from mobile to ubiquitous computing.

Here, interaction is viewed as the multitude of intersectional processes between humans and digital technologies that enables computer supported actions to be undertaken.

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## 2 Interaction

In doing so, this first chapter introduces and describes the rise of Ambient Informatics and present Mark Weisers vision of ubiquitous computing as a point of departure for addressing the essence of interaction, and as a point of departure for the construction of *interaction through textures* as an analytical framework for understanding interaction with and through interactive architectures.

### FROM DESKTOP COMPUTING TO UBIQUITOUS COMPUTING TO EVERYWARE

Since the introduction of the Personal Computer (PC), in the mid 80's, i.e. the "PC era" we have witnessed a tremendous development in the area of digital technology. In just 20 years the computer has transformed from being a slow, clumsy and stationary unit to become a lightweight, mobile, and instantly accessible device that has found its way into our everyday lives (Greenfield, 2006). Today, the modern computer is so highly interwoven and blended into our everyday lives, activities, routines, hobbies, and leisure hours that we have started to use terms like *embedded*, *ubiquitous* and *pervasive* computing to describe this disappearing character of modern IT. This development was predicted 15 years ago by Mark Weiser who stated that: "*For ubiquitous computing one of the ultimate goals is to design technology so pervasive that it disappears into the surrounding*" (Weiser, 1991) and in his paper "The computer for the 21st century" he continue to argue that: "*the most profound technologies are those that disappear. They weave themselves into the fabric of everyday life until they are indistinguishable from it*".

Today and in a foreseeable future this trend is likely to continue. Many of our surrounding everyday physical environments are changing character as they get blended with new digital material. They are becoming increasingly interactive in a way we have not earlier experienced. These new interactive environments are often portrayed as being responsive, active, sensitive, and in a constant dialogue with us as users or inhabitants. While this trend started out with quite simple and small-scale examples of so called TUIs (tangible user interfaces) in which a user can interact with, and manipulate, digital material though the interaction with physical objects, this trend is now developing on a large scale basis due to the development of new *transmaterials* (Brownell, 2005), i.e., physical material with interactive characteristics, and with current movements towards the creation of ubiquitous computing landscapes realized through e.g. interactive wall installations, mobile devices and small size computers. This trend is captured in terms like *ambient intelligence* (e.g. Lindwer, et.al., 2003; Aarts, 2005; Gárate, et.al., 2005) *smart environments* (e.g. Siegemund, et.al., 2005; Das & Cook, 2006), *interactive environments* (Pinhanez, & Bobick, 2003) and *interactive architecture* (e.g. Zellner, 1999). Malcolm Mc-

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