

# Designing Ambient Intelligence: A balance between Black and White Magic.

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Let's first take a glimpse back in history. Before the rise of science people attributed events like diseases, spontaneous recoveries and negative weather events to magic and higher powers. This was based on a lack of understanding of the processes behind it. As science progressed people started to understand these (natural) processes and how they could or could not be controlled. This knowledge and understanding gave people the ability to estimate the behavior of nature and anticipate on it by using technology (modifications of nature) but this took away some of the magic.

At this moment magic can still be found in products and services that use technology in a innovative way, a way it's not been experienced before. B&O has a radio which automatically slides open its doors and starts playing when you move your hand in front of the radio. It's like the radio has been enchanted. Also electronic devices capable of knowing where you are like navigational devices appear magic to some people as well.

Science fiction author & physicist Arthur C. Clarke once said: "Any sufficiently advanced technology is indistinguishable from magic". In reaction, Benford said: "any technology distinguishable from magic is insufficiently advanced".

I believe that Ambient Intelligence (AmI) has got a property that will accelerate the implementation of magical experiences into our world and will add a whole new chapter to the discussion on the comparison between technology and magic. But do we want to have magic in our AmI systems, can it be trusted?

Ambient Intelligence will split the application of technology into two parts: the upper world technology and the underworld technology. In the upper world, technology is used as the interface for the ambient intelligent system and is fully integrated into the environment. This is the part that is visible to and perceivable by people and interacts with them. In the underworld, computational technology and information sharing technology is located. This part is neither visible to nor perceivable by the user. This distinction between the two worlds will make it difficult for people to fully understand the underlying processes and principles of the system and will bring them back to the situation in history sketched before: events happen (through the interface in the upper world) but how it works cannot be derived since the underworld technology is not visible. This distinction can make AmI systems to be perceived by its users as magic.

Designers are the ones that are going to create these systems. You could say that designers are the magicians of the future and ambient intelligence will be their potion. Implementing magic can be positive. It can give the user a thrilling, more natural and honest interaction. Secondly the user is not bothered with the complexity of the system. However the downside is that this obscurity for the user on the underlying processes also gives the freedom to the designer to implement whatever he wants in the underworld technology since the user will not be aware of it. And because Ambient Intelligent systems can become very interwoven into our daily lives this can lead to controversial results.

Ambient Intelligence systems rely on information. Without information an AmI system cannot function. This information can be gathered by its interfaces, these can be sensors but also network interfaces with other ambient systems. Knowledge is Power; the kind of rich information AmI systems can gathering can be very valuable for companies and governments. Since designers will design these systems and therefore also the information flow, designers have got a big responsibility on what to do with this information.

The system could be designed in such a way the user perceives the system as positive, White Magic, while it may actually also be negative, Black Magic: a second agenda of the designer in which the information secretly is relayed to a buyer. By allowing the positive magical user experience we have to take a decrease of transparency for granted. So eventually the question if you are willing to share information with an AmI system is closely related to the integrity of the designer. As more and more devices get connected to the internet AmI is suggested as an extension of the internet. Internet has developed into a system that has got no central control, it cannot be turned off and is not entirely controlled by anybody. So eventually it's up to the designers of AmI to find the positive balance between White and Black Magic and to find out if the benefits of a magical user experience and trust can be incorporated into AmI together.