Ambient Media Culture:
What needs to be Discussed When Defining Ambient Media from a Media Cultural Viewpoint?

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ABSTRACT

Ambient media is a new form of media, which deals with media objects that mediate information throughout the natural environment of people. In ambient media environments, the media becomes part of daily life activities and environments – similar to location based services, where the physical world has a virtual digital overlay providing digital services for the consumer on a specific location. As any new media environment, also ambient media environments enable a new form and way of communication and impact on human culture. This article should provide a first starting point for discussing the wide topic of ambient media, and introduce aspects that relate to the development of an ambient media culture. The article shows different notions and discussions from a media cultural perspective, that impacts on ambient media environments. It compiles the results of the discussions that took place during the 2nd meeting of the Nordic network "The Culture of Ubiquitous Information" in Helsinki on the 19th January 2011. It shall lead to an initial discussion of this aspect and provide new ways of thinking how ubiquitous computation will impact human culture and which impact theories of Martin Heidegger or Katherine Hayles have in this context.

Keywords: Ambient Media, Experience Designs, Human Culture, Media Culture, Ubiquitous Computation

INTRODUCTION

With the introduction of ubiquitous computation, a new technology was emerging in the world of information processing. Ubiquitous computation is based on Mark Weiser's idea to embedded computerized equipment seamlessly throughout our natural environment (Weiser, 1993). Humans would interact with the digital world while they are engaged in their daily activities without being aware about the information processing infrastructure. Similarly, the world of pervasive computation (NIST, n.d.) and ambient intelligence seeks to embed information systems throughout our daily life and activities (IST Advisory Group, 2003; Ducatel, Scapolo, Leijten, & Burgelman, 2001). Several of these three terms can be used synonymously for the same phenomenon.

Viewing this technological trend from the viewpoint of media, we can see a trend towards the emergence of a new media form: the media form of ambient media (Lugmayr,

2007). Ambient media seek to embed media objects throughout our daily living environment to transmit information and media messages. The media object merges with human living objects. Many practical examples exist in research laboratories and in our practical life. Just a few very typical examples are smart homes, ambient interactive screens, location based services, and context aware devices. A few more examples can be found online (http://www.ambientmediaassociation.org). As ambient media are newly emerging, it's critical to understand the culture and social aspects of this new medium. Therefore, the viewpoint of ambient media within the scope of this research article is on cultural aspects of ambient media and the sociological aspects of this newly emerging media form.

McLuhan & Ambient Media

Ambient media follow the notion of Marshall McLuhan's thesis that technology determines social outcome. Firstly a new technology is developed and enables to extend a life model outside the mind. Thus, media extend human senses of sight, hearing, touch, and smell to generate ideas, a new perception of the world,

new experiences, and emotions (McLuhan & Lapham, 1994). Ambient media as extensions of our bodies will affect our mind-set and have impact on society and how it relates to our mental functions. While considering the content model for broadcasting, which developed from mass media (e.g., public service broadcasting), towards niche media (e.g., documentary channels), towards participatory media (e.g., social media) (Kueng, 2008). We are now in the age of ambient media, where media environments become smart and react on behalf of the consumer. This trend is depicted in Figure 1.

The main aim of this research work is to focus on the social and cultural impact, changes, and evolutions that took place that led towards the development of ambient media. The article shall compile the results of the discussions during the 2nd meeting of the Nordic network "The Culture of Ubiquitous Information" in Helsinki. The main research questions of this research paper are:

- What are ambient media and their characteristics?
- Which impact do ambient media have on culture?

Figure 1. Evolution of the content model in broadcasting (extended in Lugmayr, 2010; Kueng, 2008)

- Which affect does culture have on ambient media?
- Which theories exist to describe the culture of ambient media?

Related Works

Media on a general level are always an intersection of the fields of media economy, technology, regulation & policy, audience & society, and media studies & communication theory. The same applies for ambient media. Much research already devoted to defining ambient technologies and standards (see e.g., IST Advisory Group, 2003; Ducatel, Scapolo, Leijten, & Burgelman, 2001; Riva, Vatalaro, Davide, & Alcaniz, 2005), basic business principles and audience research (see e.g., Lugmayr, 2010), and ambient media as art (see e.g., http://www.ambientmediaassociation.org). However, within the scope of this article, the aim is to discuss ambient media from a media studies & communication theory perspective.

INTRODUCING AMBIENT MEDIA

Generally the many time referenced sentence, that media are the "form and technology used to transmit information" is also valid for ambient media. In ambient media the technology is based on ambient intelligence. Ambient intelligent technologies can be separated in hard and soft components. Soft components refer to intangible components such as software, algorithms, ways of computation, and artificial intelligent methods. Hard components refer to tangible components, such as sensor networks, network technologies, smart materials, and systems (as based on IST Advisory Group, 2003; Ducatel, Scapolo, Leijten, & Burgelman, 2001). The important element is that we can describe ambient interactivity as a matter of implicit or explicit interactivity with a complete self-assembled service space that aggregates the content in behalf of the consumer. Information

is not solely a matter of data and information, it rather extends towards an agglomeration of knowledge, information, data, and wisdom provided to the consumer as an experience (Lugmayr, 2012).

The characteristics of ambient media have been many times discussed and identified. They following principles are generally valid (Lugmayr, Risse, Stockleben, Laurila, & Kaario, 2009):

- intelligence – creation of a digital mind counterpart;
- manifestation – rendering of media throughout our natural environment;
- morphing – connection of the real world with the digital overlay;
- collaboration – collaboration between either humans, objects, or either;
- experience – from simple data and information processing to knowledge and wisdom processing.

Thus ambient media underlay certain principles, which distinguishes this form of media from many counterparts. In ambient media, the media moves away from the screen culture, where a screen is the central rendering part for audio-visual content as e.g., on TV, PC games, or mobile phone screens. The environment as such becomes the mediator between the real physical world and the digital overlay, as e.g., smart wallpapers that illustrate colors depending on the mood of the consumer, or electrical screen-less children toys. However, ambient media also will have impact on cultural aspects, and change the way how people use technology. In today's world we mostly rely on the PC as interaction device in many professions as e.g., film editing. In the past, editing was a process of physical interaction with film material. The same trend is seen in many other professions as well – the PC paradigm with mouse and keyboard becomes the object for interaction. However, in ambient media we see

a trend towards tangible user interfaces (Ullmer & Ishii, 2000), where objects map functionalities between physical objects and the digital world. Tangible user-interfaces still maintain their physical properties, but are empowered by computer systems. This leads to a change in culture, especially an ambient media culture can be foreseen.

9 NOTIONS IN DISCUSSING AN AMBIENT MEDIA CULTURE

Within the scope of this section, 9 notions in discussing an ambient media culture are presented. The section contains the discussions around the theme ambient media that were held in conjunction with the 2nd meeting of the Nordic network "The Culture of Ubiquitous Information" in Helsinki on the 19th January 2011 (Figure 2).

This section shall provide media scholars with a starting point, and a few leads towards the development of an ambient media culture. The discussion is left opened, and shall only give a few hints in which directions explorations of this new field are possible.

Notion of Programming

The first notion that needs to be discussed is the *notion of programming* – how are people able to understand the functionality of certain objects in smart environments (e.g., gesture based input devices). Thus the notion of programming, learning the programming environment, and learning the functionality of software tools becomes one essential part to understand how to create smart environments with increasing complexity. This discussion deals with the idea of programming vs. logics and the understanding of the concepts behind it in the world of ambient media (Lister, Dovey, Giddings, Grant, & Kelly, 2009).

Notion of Cultural Awareness

The second notion is the notion of *cultural awareness* of ambient media. How people are aware about this new media form, and how can they explore or extrapolate new platform. Especially when introducing a new form of media, the discussion around cultural awareness of this new media form is of importance.

Figure 2. Compilation of the 9 notions in discussing an ambient media culture
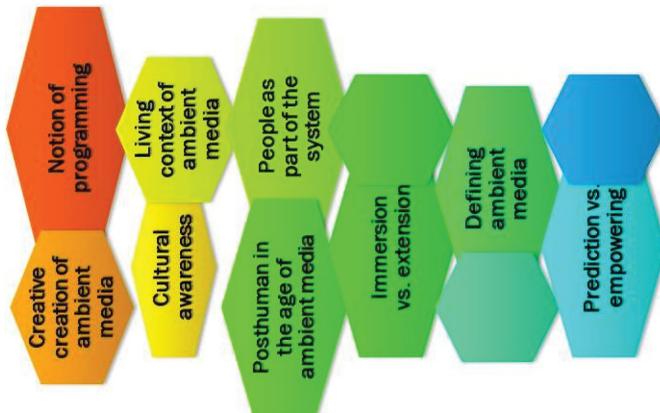
Notion of How we Became Posthuman

The third notion is the notion of how we became *posthuman*, and how ambient media will affect this phenomenon. This discussion addresses the discussion of period vs. constellation in form of players, homeostasis, reflexivity, virtuality, artefacts, and skeuomorphs. This notion follows the ideas of Katherine Hayles (Kueng, 2008; IST Advisory Group, 2003).

Notion of People as Part of the System

Another issue to discuss is Martin Heidegger's thesis of *people as part of the system*. The forth notion devotes to a discussion around the history of information technology, and the waves where things get further developed and more powerful (Lister, Dovey, Giddings, Grant, & Kelly, 2009). One development is e.g., the trend from mainframes towards PCs, towards personal gadgets, towards interconnected gadgets, and finally towards cloud computation.

Notion of the Living Context of Ambient Media

This also leads to the discussion of fifth notion of ambient media - the living context of ambient media. Thus what the actual context of ambient media is, and in which contexts people use this newly emerging media form. It can be the mobile context or some static living environment as e.g., at home. This notion is tightly related to the previous notion, where people are seen as part of the system (see e.g., Lister, Dovey, Giddings, Grant, & Kelly, 2009). But current efforts, such as ambient assisted living, or the usage of mobile phones show already some preliminary living contexts for this new media form.

Notion of the Creative Creation of an Ambient Media Environment

The sixth notion is the notion of creative creation of ambient media environments. McLuhan's thesis has a taste of technical determinism. However, modern creative ways of thinking especially "Design Thinking" (Ducatel, Scapolo, Leijten, & Burgelman, 2001) have a more creative approach towards the creation of services. There is a clear separation between rationality and creativity, which requires a cultural component of the content model described above. It also emphasizes the enrichment of culture and social evolution. Thus there is a parallelism between the content development and the social creativity in the content model. A discussion around 'Gestalt,' which describes the relation between creativity and the artificial environment might let a new way of thinking emerge.

Notion of Immersion vs. Extension

The seventh notion is the notion of *immersion vs. extension*. As technological developments move in waves and certain patterns, how will ambient media affect this phenomenon? In principle technology might be a means of survival; however, it can be also seen as irreversible of movement of putting something forward. But in this case, what drives ambient media, and what is the key of emergence? In terms of human collaboration – what is the development forward, and how do ambient media externalize human functionality? Ambient media are a new way of means of survival as e.g., in future warfare scenarios. However, how do ambient media drive other aspects of life? These are many starting questions to discuss in the field of ambient media.

Notion of Defining Ambient Media

The eights notion is the notion of *defining ambient media* as such, as this has a dual side. On the other hand, ambient media are currently in the brink of emergence, thus their definition still requires time and efforts to find various application areas, and a clear definition of the concept. Currently ambient media as a media form are still ungraspable, and eventually a too high level concept to understand. But their definition is a matter of time – especially when

more and more ambient media products are emerging. Also artistic installations and projects are showing the pathway.

Notion of Prediction vs. Empowering

Another important notion is the notion of prediction vs. empowering. This underlines the concept of Habernas's ideas of predication vs. empowering. This will be another notion from a media culture viewpoint to be developed in the context of ambient media.

DISCUSSION AND CONCLUSION

Within the scope of this article, ambient media are discussed from various viewpoints coming from media theoretical and social science studies. This article shall shade a different light on ambient media, and is an attempt to define ambient media from another perspective. It compiles and extends the discussion from the 2nd meeting of the Nordic network "The Culture of Ubiquitous Information" in Helsinki on the 19th January 2011 to start the discussion how ambient media can be seen in a cultural context.

Ambient media are slowly manifesting in our daily life. Cultural awareness will be a matter of services that are slowly emerging in our daily activities. Location based services, such as GPS based navigation are such an example. More complex ambient media services, such as emotional computation require more technical fine-tuning to provide robust interfaces. But e.g., for assisting people with special needs and providing them with a new communication channel, they will be provide many new possibilities. The blind are provided with the technical capability to 'see' emotions in peoples' faces through emotion recognition.

Thus ambient media are still on the brink of emergence, and a more thorough discussion from the media study theoretical viewpoint is required. This article shall solely compile a few starting leads for further investigation together, rather than already discuss these thoroughly.

REFERENCES

Ducatel, K., Scapolo, F., Leijten, J., & Burgelman, J. C. (2001). *ISTAG scenarios for ambient intelligence in 2010 - final report*. Retrieved from ftp://ftp.cordis.europa.eu/pub/ist/docs/istagscenarios2010.pdf

IST Advisory Group. (2003). *ISTAG ambient intelligence: From vision to reality*. Retrieved from ftp://ftp.cordis.europa.eu/pub/ist/docs/istag-ist2003_consolidated_report.pdf

Kueng, L. (2008). *Strategic management in the media - From theory to practice*. London, UK: Sage.

Lister, M., Dovey, J., Giddings, S., Grant, I., & Kelly, K. (2009). *New media - A critical introduction*. New York, NY: Routledge.

Lugmayr, A. (2007). Ambient media. *Novatica*, *33*(188), 35–39.

Lugmayr, A. (2010). Introduction to the business processes with ambient media - challenges for ubiquitous and pervasive systems. In Z. Yu, R. Liscano, G. Chen, D. Zhang, & X. Zhou (Eds.), *Proceedings of the International Conference on Ubiquitous Intelligence and Computing* (LNCS 6406, pp. 125-137).

Lugmayr, A. (2012). Connecting the real world with the digital overlay with smart ambient media - applying Peirce's categories in the context of ambient media. *Multimedia Tools and Applications*, *58*, 385–398. doi:10.1007/s11042-010-0671-3

Lugmayr, A., Risse, T., Stockleben, B., Laurila, K., & Kaario, J. (2009). Semantic ambient media - An introduction. *Multimedia Tools and Applications*, *44*(3), 337–359. doi:10.1007/s11042-009-0282-z

McLuhan, M., & Lapham, L. H. (1994). *Understating media - The extensions of man*. Cambridge, MA: MIT Press.

NIST. (n.d.). *Pervasive computation, definition*. Gaithersburg, MD. *NIST*.

Riva, G., Vatalaro, F., Davide, F., & Alcaniz, M. (2005). *Ambient intelligence*. Amsterdam, The Netherlands: IOS Press.

Ullmer, B., & Ishii, H. (2000). Emerging frameworks for tangible user interfaces. *IBM Systems Journal*, *39*(3-4), 915–931. doi:10.1147/sj.393.0915

Weiser, M. (1993). Hot topics-ubiquitous computing. *Computer*, *26*(10), 71–72. doi:10.1109/2.237456

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