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The Concept of Media

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Abstract

Internet as a synonyme of the „new media“ not only contains and disseminates information worldwide – like electronic broadcast media - , it is also capable of processing information in an interactive manner, since it is computer-based, i.e., its information objects are virtual machines. Thus, the potential of the new media is urging us to reconsider the notion of media. Since we witness that formal logic is constituting the concept of the computer, we need a new model of „media“ to describe, understand and manage the effects of the new infosphere[1].
We propose a new model for media, namely for computational media, that includes the effects of the processes that are changing and evolving knowledge, executed by humans or computers.

[1] Infosphere means the entity of new media, comprising the new ICT, which is surrounds the globe metaphorical like a sphere containing ubiquitous information objects

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1. Fundamental changes for the notion of „media“ with the new ICT

The new medium computer is changing the notion of a medium, which hitherto meant the press or printmedia and the meanwhile classical electronic media. Since the development of the computer as an universal information carrier, able to integrate all known types of media (say “multimedia”) and its combination with telecommunications, the term „new media“ includes „communication“. In fact, the five factors constituting communication, as initiator, recipient, vehicle, message, and effect[2], include the defining characteristic of the new media.

Besides unique communication advantages of the new media, as

- *Democratic access*: Access as is offered by Internet is open for everybody, any time, anywhere, to the same conditions;
- *Low costs*: Internet contains information and knowledge of different communities worldwide, being displayed on a mouse click;
- *Updated contents*: New and changed entries on World Wide Web undergo no delay in the communication process, instantly, they are available for everybody;
- *Approach to the contents*: any requests about a topic can be ordered by keywords, using a choice of powerful search engines[3] able to browse Usenet and World Wide Web. This comprehensive approach for information should not be underestimated, although there is accord that at present tracing down the desired bit of information is as difficult as searching for the needle in a haystack;
- *Disposal of contents*: the information processed by the Internet is digital, multimedial, interactive (answerable) and thus adaptable to a variety of purposes by the user;

A new aspect of the new media is their processing capacity, providing us with *living* information.

- As said above, media hitherto were understood as mere carriers of information, thus the information was passed passive (or „dead“). Only human beings could transmit „living“ information (say, could explain the information in dialogue with the receiver) - until the invention of computers.
- Today, computers offer interactive information with the capability of self-application wrt. to queries, to problems and data. This affects the process of communication and the notion of media.

[2] Cf. „A Glossary for the NetAccademy“, citing Watson J./ Hill, A.: A dictionary of communication and Media Studies, 4th edition 1997, Arnold/Gate Headline Group, London and New York, 1984-1997
[3] As yahoo, altavista, lycos, excite and the like

We therefore propose a new model for the term „media“ which includes the processes that are changing and evolving the knowledge in the process of transmission, which are executed by distributed „agents“ – be they humans or computers.

2. Computation and logic

The concept of the computer, core of the new information infrastructure, is rooted in the formalistics of logic as developed in the end of the 19th and the begin of our century. The rise of the scientific method, going back to Galilei, Descartes, Leibniz and other mathematicians in the 17th ct., initiated first a scientific and engineering approach towards matter and space: It got hold of the Cartesian „res extensa“[4] via the formal description of time and space in terms of analytical geometry and analysis and eventually determined the modern quest of scientific truth. The formalization of logic and language and of computation submits the Cartesian „res cogitans“[5] to the scientific method. Computation is now closely related to (formal) logic, and vice versa (- as titles like “computational logic”[6] suggest). We are witnessing how information management is reengineering and how formal logic will structure the global infosphere[7]. To describe, understand and manage these effects, we need a model of „media“, which arises from the same body of concepts as its carrier, the computer, does.

3. Computational media, a new concept

Here we announce a new media model, which we will present in more detail at the next workshop. We model media as spaces of platforms, i.e., as media for multi agent systems. Active *agents* collect and represent information as their knowledge. They are able to learn, to reason about their knowledge and to adapt themselves to their environment. Agents represent humans as well as other interactive carriers of information as e.g. computers or databases.

The behavior of agents is determined by their *roles*, describing rights and obligations.

Agents have locations in time and space. *Channels* connect agents and facilitate communication and navigation.

In communication, knowledge is externalized, represented by a *code* (meme, in R. Dawkin’s terms[8]), and stored on a channel, in order to become transportable.

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[4] René Descartes (1596-1650) proposed that mathematics (the „Mathesis universalis“) be the ruling cncept of the world, comprising the „res extensa“ (matter and mechanisms of the world) and the „res cogitans“ (reflection).

[5] See Note 2.

[6] Cfr. Dov M. Gabbay : What is a Logical System? Studies in Logic and Computation, 4. Ed. Oxford Science Publications, 1994, or:
René Lalement: Computation as Logic, Prentice Hall International Series in Computer Science. C.A.R. Hoare Series Editor. Masson Paris (1990)
Prentice Hall, Hemel, Hempstead (1993), or:
Nicholas Pippenger: Theories of Computability**.** Cambridge University Press, 1997, or:
David B. Fogel. Evolutionary Computation. Toward a new philosophy of machine intelligence. IEEE Press, New York 1995

[7] Infosphere means the entity of new media, comprising the new ICT, which is surrounds the globe metaphorical like a sphere containing ubiquitous information objects

[8] R. Dawkins, The Selfish Gene, Oxford University Press, New York 1976, or:
Richard Brodie: Virus of the Mind. The New Science of the Meme. Integral Press, Seattle, Washington, 1996, or:
Joel Shurkin: Engines of the Mind. The Evolution of the Computer from Mainframes to Microprocessors. Norton & Company Ltd., USA, 1996, or:
Danah Zohar and Ian Marshall: The Quantum Society. Mind, Physics and a new Social Vision. Danah Zohar and Ian Marshall, Ed. Zohar/Marshall, William Morrow and Co., 1994

Protocols regulate the communication between agents.

The formal basis of a medium is a logical system, comprising the logic modelling the multi-agent system as well as the logic in which the agents represent their knowledge. The logical system determines the formal relation between the representation of information objects, and the world, partially represented in the medium. It comprises also the notion of deduction of knowledge from the knowledge bases of agents and the way a medium with it agents evolves.

We consider the memotype of a medium as well as the processes of selection of memes or memotypes, respectively, of agents and the process of adaptation and learning.

Particular of this notion of medium is that it is dynamic and active: The processes of accumulationg, representing, disseminating and managing knowledge on a medium are an integral part of our media metaphor[9]; the medium comprises different kinds of (active) agents as its parts.

This metaphor enables us[10]

- To analyze and understand media,
- To organize the processes of collection, accumulation, dissemination and management of information, and
- To specify computer based media in a way which is required by this technology: Due to the formal basis of our approach, the description of a required medium is its specification in the sense of computer science. The implementation of this specification provides us with the technical infrastructure of the required medium.

[9] cf. Beat Schmid, Ulrike Lechner: A Computational Media Metaphor. Conference paper presented at the 1st European Joint Conference on Theory and Practice of Software (ETAPS), Lisboa, Portugal, April 1998, cited in the NetAcademy.
[10] We have implemented this concept of media in several tools in two fields, knowledge and business media. The Internet platform for knowledge exchange in the Internet, called NetAcademy (www.netacademy.org), is a medium for a living encyclopedia and online publishing for a scientific community.