

Defining a communication system for the long term

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One year ago, the *Centre de recherches sémiotiques* (CeReS – Semiotics Research Centre) at Limoges University launched a research project within the scope of Andra’s Memory project. As research at the CeReS focuses on semiotics, linguistics and information and communication technologies, these disciplinary fields also provided the framework for our work on radioactive waste repositories and long-term memory. Communicating with the general public about waste repositories is an integral part of the construction of a memory. However, the lack of historical experience in communication, especially when dealing with “marking”, has been highlighted. Accordingly, in close collaboration with our contacts at Andra – who gave us their requirements and expectations in terms of results – we established the relevant objectives and studies for this undertaking. We presented our method at the Constructing Memory international conference and gave an update on our fields of investigation.

The initial purpose of the research project

The starting point was to identify the methodological and theoretical requirements for undertaking a semiological study on how to “guarantee” long-term communication on radioactive waste disposal.

We then introduced the premise that it was not marking (consisting in a language, image, symbol or code, etc.) that needed to be made sustainable but rather *the process for communicating on it*. So the initial hypothesis on the “long-term” communication process (with “long” defined in terms of the Records, Knowledge and Memory project) assumes the need for a “communication system” approach i.e. a coherent and significant set comprising elements that interdepend on each other according to differences and similarities. The communication system is a system of relations, which entails the notions of stratification and sub-system in particular.

The work undertaken

Two types of related assignments were launched, at different stages:

Bibliographical research (at the start of and throughout the project)

This work confers scientific legitimacy to the research project by inventorying everything that has been produced on long-term communication in general, and, when it exists, on radioactive waste storage in particular. This inventory helped identify a lack of bibliographical references on the subject. As a result, the preparation of an *appropriately*

*comprehensive*¹ reference source on the thematic of the Memory project was methodologically indispensable (see the initial purpose above) for establishing a bibliographical classification (by type, theme and chronology).² The classification also revealed that, to this day, no seminal study in the field of long-term communication exists, only introductory work (Human Interference Task Force; Sebeok), thereby further confirming the findings reported by Buser (i.e. that there is a lack of in-depth studies on long-term communication). More importantly, the classified reference source helped establish the “profile” of the study to come. This profile is the guiding thread for conceiving long-term memory through communication devices that are to be adopted or avoided.

This “guiding thread” was followed by **two studies**, on **durability/longevity** (of media and language) and on **exposure** (in terms of accessibility, sharing and exploitation) that resulted in the following steps:

- creating a methodological “profile” for semiological studies on the Memory project (with objectives unrelated sociology, behavioural psychology or cognitive science);
- promoting the written form as the best guarantee for reliable transmission;
- transmitting it according to a “principle of tradition”;
- drafting semiotic specifications for the long-term marking communication system;
- managing the repository as a site that “enunciates” and “communicates”, neither term being metaphorical in the context of a semiotic study;
- creating a dedicated communication system for the collective memory of radioactive waste.

The durability/longevity study highlighted that it is not a linguistic structure, languages, images (e.g. pictograms) or the materials used for a specific medium that guarantee the longevity of an informational message, but rather the fact that a series of elements form a meaningful whole that is transmitted using the principle of tradition.

Still, the Exposure study revealed that, in addition to not guaranteeing the longevity of an informational message, languages, media etc. also do not guarantee its integration/being taken on board. It is the repository itself, and in its role as such, that becomes “discourse” by way of a contract of communication.

The notion of discourse brings a fundamentally semiotic dimension to the objectives of Andra’s Memory project, as the repository itself has to enunciate and therefore has to live; and to do so it needs to be associated with mankind.

A semiotic study of sound perception, connected to this project through work on robust sounds, also includes this fundamental dimension.

The findings pointed towards the use of a *multidimensional* message for radioactive waste repositories, for the purposes of information (“storage site here”), calling out (warning, preventing or alerting people), and integration (with regard to the surrounding environment), which entails a series of conditions:

- In order to be multidimensional, the message should be in accordance with a definition of *the conditions of its transmissibility*.

1. This includes domestic and international publications about social science (the field of the CeReS study), classified by selective research areas using keywords.
2. By a team of archivists/librarians from the Joint Documentation Department at Limoges University.

- This transmissibility cannot be established independently of human integration of the repository.
- Human integration of the repository, which is a reflexive acquisition, cannot be defined in the long term independently of the human integration of the repository in the short and medium terms, for the purpose of a long-term memory.

Nevertheless, like memory, the integration of the repository in the long term is not the sum of short- and medium-term integrations; neither is the long-term communication system the sum of the communication systems designed for short- and medium-term storage. It is therefore necessary – and this is a field that is currently being explored – to define the communication system *per se* and the integration of long-term storage *per se*, both in terms of the short and medium terms and independently of them.

This approach needs to be considered from a semiotic perspective.

With reference to the above conditions, it is important to highlight that one main method of ensuring longevity in terms of integration is not to isolate the repository from people, but rather the opposite. Even if the communication system requires sustainable media it mainly requires sustainable human actions to produce its memory. Consequently, the *prohibition* of human actions (in the short and medium terms) on the site of the repository needs to be “counterbalanced” by an *authorisation* for the respective communication systems in order to encourage long-term integration of the marking. These communication systems have to integrate the value system linked to radioactive waste, i.e. the value attributed to waste by people – in both the short and the medium terms, as the study of the question of long-term communication cannot be treated independently of the issues of short- and medium-term systems (their contexts and organisation) to establish a long-term communication protocol, i.e. one that is beyond context and temporality. The protocol has to be acontextual and achronic as it needs to meet requirements for all contexts and all timeframes. Lastly, the protocol needs to assimilate the repository within its environment by associating in the same significant whole the marking, the site’s design and human actions.

Current objectives

This hypothesis is currently being examined in the form of a protocol of transmissibility with the aim of:

- thinking more deeply about the link between “media” and “tradition”;
- making proposals for a communication system based on a “model relay”;
- defining a protocol of transmissibility based on three storage stages/three memory stages;
- in order to develop links between communication systems, transmissibility and memory construction.
- our methodology is based on:
 - Notes/directions for use¹ covering a bibliographical selection (with one research axis on the performance of communication systems using linguistic structures/languages/media, another on public perception). The notes all contain four sections:

1. Prepared by final year and doctoral students on our Semiotics, Linguistics, Information and Communication Sciences courses.

- references of the publications or articles;
- field (e.g. linguistics);
- summary;
- relevance of the article for the Memory project.
- Two ad hoc studies included in the protocol of transmissibility:
 - A questionnaire on the perceived risk of nuclear power (to test the mindset of a given population regarding radioactive waste).
 - Discourse strategies in communication on nuclear risk using precise expressions designed to guarantee medium-term understanding of the communication in question.

The next step is towards a monitoring system *for communication*.

References

- Human Interference Task Force (1984), *Reducing the Likelihood of Future Human Activities that could affect Geologic High-level Waste Repositories*, Technical Report BMI/ONWI-537, Office of Nuclear Waste Isolation, Battelle Memorial Institute, Columbus.
- Sebeok, T. (1984), *Communication Measures to Bridge Ten Millennia*, Technical Report BMI/ONWI-532, commissioned by the Office of Nuclear Waste Isolation, Battelle Memorial Institute, Columbus, www.osti.gov/scitech/servlets/purl/6705990/.