
Developing a meta-language in multidisciplinary research projects: the case study of READ-IT

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ABSTRACT

This paper presents the philosophical analysis carried out to analyse the stakeholders' needs within the READ-IT project to inform the design of an information management system (IMS) for multidisciplinary research on the *reading experience* in Europe. The presented approach is aimed to build a metalanguage representing the reading under different perspectives for enabling researchers in collaboratively working on data sources tracking the reading phenomenon. The construction of the metalanguage is made through a reasoning-based process of analysis and synthesis of vocabulary, concepts and theories from multiple domains, recomposed in an interactional model of the researchers as intended users of the system, the data sources on reading and the role of technology in between.

INTRODUCTION

This paper presents a methodological approach to carry out a philosophical analysis aimed to build an interactional model [23] on the needs of the stakeholders involved into the design of a new digital tool [12]. This approach had been experimented in a case study concerning the design of an information management system (IMS) for multidisciplinary research on the experience of reading, within a project called READ-IT (<https://readit-project.eu/>).

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KEYWORDS

Interaction design; Interactional Model; Stakeholders analysis; Meta-language; Multidisciplinary Research;

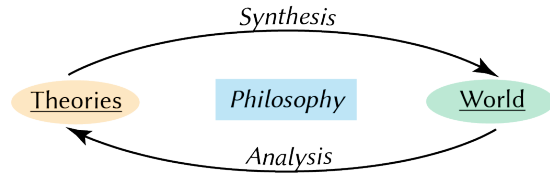


Figure 1: Schema of the philosophical analysis as an iterative process of conceptualisation of phenomena into the world and elaboration of theoretical frameworks for their investigation.

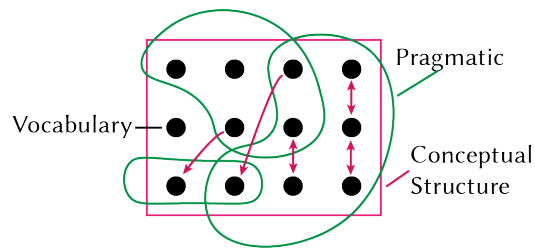


Figure 2: Schema of the meta-language components.

READ-IT is a project aimed to support knowledge discovery on the study of reading as a collaborative activity across a plurality of research groups. One of the main objectives of the project is to develop a common information infrastructure to ensure the interoperability of research data and facilitate their production and sharing within and in between different research groups. This interactive system is expected to enable unprecedented macroscopic research [19] on transversal topics such as the impact of reading in shaping the European identity and, at the same time, to provide more instruments to improve data gathering and analysis on individual aspects of reading for single research groups.

The key stakeholders of the READ-IT are the nine research groups affiliated with the five consortium members and the four associate partners of the project, even though the list of stakeholders also include a software development company, the EU JPI Cultural Heritage founding body, and external bodies such as national libraries, conferences committees, book fairs and local organisations promoting reading. We focused our stakeholders’ analysis on the nine research groups intended as primary perspective users of the system to be designed. These research groups work on the history of reading, history of book, history of literature, humanities and literature studies, digital reading, digital humanities, sociology of reading, psychology of reading, bibliography and library science. Each research group brings into the project a specific vocabulary, a corpus of theories and research methods, as well as particular logic for defining the problems to be explored within the community agenda.

This setting configured a design problem that frequently recurs in multidisciplinary research projects, or rather addressing the challenge of envisioning a tool that can work for that plurality of users and research contexts. One approach to deal with this design problem is creating a common information space [2] based on a language that is understandable by all the involved research groups and functional to their research activities. Under this frame of the problem, the expected role of the READ-IT IMS is reconfigured as reconciling the different stakeholders’ perspectives by providing a common meta-language on the reading phenomenon.

Philosophy provides the strategies to construct this meta-language by leveraging on a circular exchange between analysis and synthesis of the theoretical aspects of the problem and the representation of the phenomenon under study into the world [fig.1]. In our case study, the use of a reasoning-based strategy of investigation borrowed by philosophy is aimed to organically integrating the research frameworks linked to stakeholders’ languages and the representation of reading as the common phenomenon of study for structuring the design space of the READ-IT IMS. This integration is the results of two combined iterative actions: dissecting the different disciplinary theories relevant for the study of reading and then reconstructing the representation of the reading phenomenon under the light of conceptual convergences and divergences.

APPROACH DESCRIPTION

In this section, we outline the structure of the philosophical analysis of the *reading experience* applied for constructing the meta-language of READ-IT IMS [18].

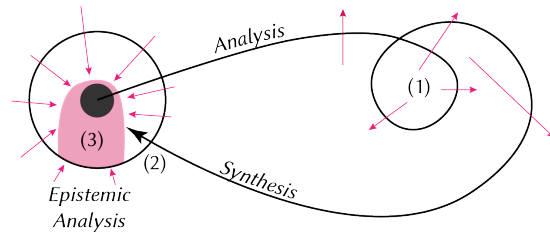


Figure 3: Flow of the reasoning-based approach for the construction of the meta-language. The starting point is reading as the object of research. (1) is the analysis and decomposition of theories on reading in their constitutive dimensions, (2) synthesis of the phenomenon, (3) epistemic analysis of technology-mediated practices for the study of reading.

A meta-language for the design of multi-stakeholder information technology is constituted by three components [fig.2]: a common vocabulary providing terms and definitions of the factors describing the phenomenon or experience into the world, a conceptual structure representing the relations among terms, and a pragmatic [3] intended as a set of practices build on the use of the vocabulary within the conceptual structure as system of enquiry of the world through technology.

We decided to construct the meta-language of the reading experience through a reasoning-based analysis, instead of that pursuing empirical approaches not matching time and resource constraints of the project. This process had been organised in three phases [fig.3]. In the beginning, we analysed the different theories related to the reading which are mainstream within and across the research communities of our stakeholders. These theories outlined a set of **dimensions of the reading** pulling the analysis toward the identification of general concepts and structures beyond the disciplinary specificities. Then, through the lenses of the phenomenology, the identified concepts and structures had been synthesized into a coherent and organic **model of the reading experience**. This model is intended to provide a comprehensive account of the reading as the object of research based on common vocabulary and conceptual structure. Lastly, the epistemic analysis of the research activities to be performed by the researchers through the READ-IT IMS defined the scope for the construction of the **interaction model** between the researcher (user), the reading experiences traced in data sources, and the technology for producing and managing these sources. The practices included in the interactional model connect vocabulary, concepts and actual uses of them constituting the pragmatic of the study of reading [fig.4].

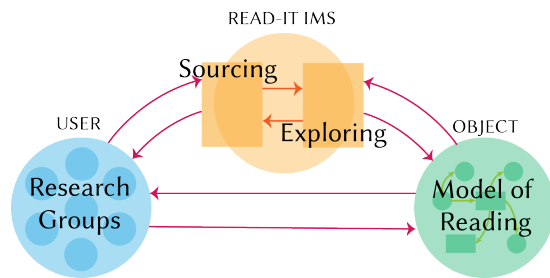


Figure 4: Schema of the macro components of the interaction model of the READ-It IMS.

The analysis of the existing theories of reading had been conducted by focusing on the recurrent and consolidated conceptualisation of reading, expressed as metaphors (e.g reading as journey, transportation, performance) [13,15,17]. The analysis of metaphors [5,24] revealed the metaphysic aspects of reading by interpreting the implicit implications of transferring the metaphors properties from their original domains to the target domain of the reading experience. [21]. These aspects cover, for instance, the distinction between physical, personal and mental environments associated with the reading experience. They provided also support to extend the analysis by sourcing from other existing theories in philosophy, considering reading as an action [8], an experience [4,7,9], and an event as performance [13,17] or situation [10]. The output of this first phase of analysis is the **common vocabulary** to describe the reading phenomenon in its multiple dimensions.

The synthesis of reading had been oriented to recompose the distinct dimensions emerging from the systematic philosophical analysis into an *“anatomy”* of reading. This synthesis had been driven by an ecological view of the reader in his physical, cognitive, personal, social environment [11,14,20] and developed through a procedural description of the reading process, by considering the cognitive perspective on this process [6,16]. The output of this second phase is a model of the reading experience based on the **conceptual structure** defined by the interdependence relations among the

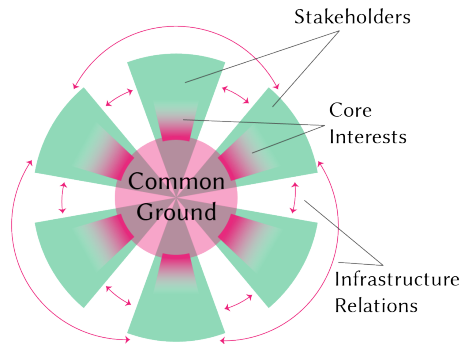


Figure 5: Value of the philosophical analysis of the stakeholders' needs. Common ground on reading for all stakeholders, an explicit infrastructure of relations among groups through the common metalanguage, a framing of the core interests of each group of stakeholders.

dimensions of the reading phenomenon.

In the epistemic analysis, the model of the reading experience had been overlapped to the variety of research practices built on producing new data sources, manipulating them and studying the reading through the mediation of technology. These practices had been analysed against the model, by focusing on their underlying systems of inquiry (intended as research assumptions, methodology, ontology, epistemology and axiology) and approaches to the generation of new knowledge. The identification of the intrinsic limits of data sources tracking the reading experience within the different research practices led to finalising the interactional model between researchers as users, data sources on reading, and technology.

The interactional model provides a guide to inform the design of the READ-IT IMS [fig.4]. However, at the same time, the meta-language on which is built is also a theoretical tool providing an account of the reading embedded within a structure of knowledge invariants [Morin]. For instance, the interactional model introduces the diachronic distinction between *reader* and *person*, and the notion of *dispositions* based on the reader's skill, abilities and values. In this way, the interactional model widens the study of reading data sources by including a rich set of human factors mediating the interactions between reader, support and content.

The validation of the interactional model built on the philosophical analysis had been carried out by involving the stakeholders (research groups) to use the common vocabulary and the model of the reading experience to discuss the salient aspects of their research issues in the READ-IT project. The researchers participating in the validation sessions had been able to use the meta-language for formulating their research questions, confirming its effectiveness in making the future READ-IT IMS an asset in their research activities.

CONCLUDING NOTES

The scope of similar IMS in previous related-projects [1,25] was limited to the management of data sources with a focus on users' tasks. Differently, the application of a philosophical analysis extended the design scope to the domain of the scientific investigation logics. In this way, it shifts the object of design from users' tasks to the object of interest of stakeholders, highlighting the value of technology to achieve their research goals.

As result, the future READ-IT IMS will also provide a conceptual platform for knowledge discovery based on the common ground across multiple disciplinary domains [fig.5]. The philosophical investigation, focused on unveiling the meanings under this common ground, creates a trail of entailments between research directions and structure of the meta-language, aspects of the phenomenon under study and the vocabulary to describe it, research questions and practices mediated by technology.

Therefore, Philosophy can form the skeleton to scaffold the orthogonal conceptualisations of the reading phenomenon, holistically articulate its components, and propagate the implications of research outcomes on the study of reading beyond the scope of single disciplines into a common map of exploration.

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