

Document Analysis (DA) as a Sociotechnical Design Framework for HCI: A Novel Tele-psychiatric Service as a Case Study

Bernt Ivar Olsen¹, Peter M. Yellowlees², Alberto Odor², Niels Windfeld Lund³,
and Gunnar Hartvigsen¹

¹Department of Computer Science, University of Tromsø

²Department of Health Informatics, UC Davis

³Documentation- and Media Studies, University of Tromsø Norway
bernt-ivar.olsen@uit.no

Abstract. We present a novel sociotechnical analysis framework; a document model and a first attempt at utilizing it in an information systems design context. We argue document analysis (DA) to be a holistic framework that encompasses technical, cognitive and social aspects of the system and may act as boundary objects to communicate the system model effectively between stakeholders, designers and engineers.

Keywords: Analysis and design methods, Sociotechnical Systems, Document- and Information Theory, Telepsychiatry.

1 Introduction - Motivation

Human Computer Interaction is a field of study ripe with powerful concepts, frameworks and techniques [1] to study and analyze human information behavior and our interaction with information systems with the goal of designing ever better and more useful systems with hassle free interaction. Although studies show that Usability and Interaction Design seem to be perceived as integrated in the same software engineering process today (which is sort of good news), there seems to be (still) a mismatch between an intention of wanting to include concepts such as usability into the product development and what is realized in projects [2, 3]. Furthermore, there seems to be agreement that a gap exists between the developers and the users [4, 5]. Several proposed solutions to amend this gap revolve around the issue of how to integrate usability or human factors analysis into systems design (i.e. [6]). At the center of this process we find the usability expert/consultant or user experience designer who is more or less supposed to build this bridge, communicating with both prospective users and developers/designers and also management [7].

As a field with a rich selection of methods, models and frameworks that, at least in sum – more than adequately facilitates detailed scrutiny of almost any human interaction with information systems – HCI is not in dire need for “yet another” framework.

However, it seems like – despite this richness of tools and frameworks something is still lacking in order to fully integrate HCI in systems design. What can be argued to be missing in this context are communication artifacts that can be used across several or all levels of the hierarchy of design of systems [8]; artifacts that are both structured and specific when needed and that also can ‘paint’ a more loosely description of the system and the parts, components and pieces of it – in order to create a coherent view and (mental) model of the system. These kinds of artifacts are commonly denoted “boundary objects” [9]. This idea of using boundary objects in this regard has been proposed by several [10, 11] and i.e. lately in Eriksson [12]. Our proposal is to suggest conceiving these artifacts as documents or document-analysis, on the basis of a broad and complementary document model. Our aim is that they may act as such communicators of a common or at least a converging model of a system to be built that will safely guide both expectations of the system (from the principal(s) of the system and all related stakeholders) and design of the system accordingly.

2 The S&F Telepsychiatric Service Case Study

We have used a proposed novel telepsychiatric service as a case study for applying the document model to a real world problem. A store-and-forward psychiatry system is based on the concept of asynchronous medical services, where an information system is utilized in order to describe a problem (an illness) of a patient and to request a specialist opinion (service). In other words, information about the patient and the illness is first collected before it is stored within the system and transferred to a remote site for evaluation by a human agent (psychiatric specialist) – who in turn evaluates the patient and the problem based on the available (provided) information and issues a response when the evaluation is finished [13].

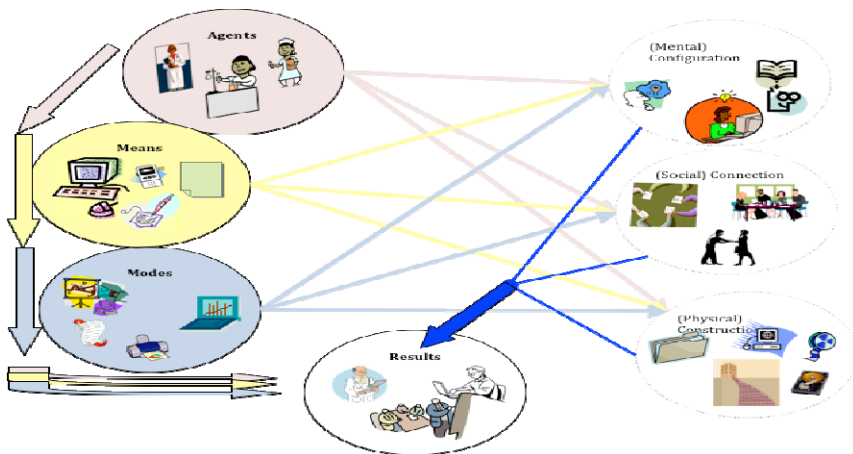


Fig. 1. The Document Model

In Figure 1 we present an illustration of the current document model, conceived from the last couple of decades of research and discourses of what constitutes a document [14]. This document model is a very broad and complementary model that encompasses many “objects”, both digital and physical that contemporary interpretation of “a document” does not, especially after the digitization of many documents.

We have created a document analysis of the system, which – in turn was used as input into the modeling process. In the analysis of the S&F system we have modeled this into a system of 2 documents: (1) the MD-doc created at the primary care giver on the basis of a standardized psychiatric interview and (2) the Psych-doc created by the psychiatric specialist.

The Psych-doc is created based on the videotaped (and possibly edited-) interview contained within the MD-doc and provides diagnostic information, treatment details as well as follow up plans for the patient. Both documents in this system are analyzed with respect to the 7 constituents of the document model: (1) Agents: who creates (authors) the documents; (2) Means: what means are used to create the document; (3) Modes: in which ways are the means used (combined) to create the document. These 3 basic “attributes” (or collections of attributes) are subsequently scrutinized in 3 complementary ways: (4) Configuration: the cognitive perspective – how the document is perceived by [users] (5) Connection: the social and cultural perspective (who relates how to this document) and, finally (6) the physical Construction of the document.

The first 3 constituents of the DM constitute sort of a “casting mold” for “classes” (groups) of similar documents while the latter 3 (4-6) identify the specific document in question. The seventh (7) constituent is the Resulting (and physically manifesting-) document and may be regarded the sum- or product of the 6 first constituents. The complete analysis may be obtained in [15] (pp. 136-156).

3 Discussion

What can be argued from the preliminary analysis of the S&F system is that the document model is a holistic approach to systems analysis. It has for years been applied to projects within the science of the Arts and within the Humanities and ours is the first attempt at gathering the concepts and model into one in order to utilize it for analysis of information systems (or rather – documentation systems).

From what we have learned it encompasses all four levels of sociotechnical systems design [16]: (1) Algorithms and (2) software containing algorithms in (1); (3) Humans interacting with computers and; (4) Social systems in which humans interact. Level (1) and (2) are contained within the conceptual model’s “means”, “modes” and “construction”, while levels (3) and (4) are covered within the “Agents”, “Configuration” and “Connection” part of the Document Model. The document analysis provides a holistic view of the system and the parts of the system, along with the processes that need to be analyzed and accommodated in order to fulfill the consequential requirements to ‘support the documentation process. Future and remaining work includes expanding the analysis of the system and applying it to design of a technical system.

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