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Short Paper

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Things have to change in order to be the same

Functional Equivalence as a Method for Analysing “the New” in “the Old” and “the Old” in “the New”

This paper will discuss an alternative methodological approach to technologically enabled change of organizational structure. Observations of technological innovation and its impact on basically every aspect of social life – be it the cell phone, ERP systems, social networking, and so forth – focuses mostly on what is new, easily leading to rhetorics of revolutionary change proposing that nothing will be the same again. While, of course, reporting on those novel aspects of technologically induced developments and, most crucially, pointing out the intended as well as the unintended consequences has a value of its own, this paper will make an attempt to describe a more balanced notion of change and novelty. The core argument will be that things have to change in order to be the same.

By taking the discussion within the librarian community on the digitalization of libraries as an example, we will develop a more differentiated view on the question of what is actually changing. Digital libraries may be very different from book- and shelf-based libraries but they are still libraries. Hence, despite all the innovations occurring in a certain domain or community, something has to remain stable. Following the work of Niklas Luhmann, Humberto Maturana, and Francisco Varela, we will introduce the notion of functional equivalencies as a method of drawing comparisons between “the New” and “the Old” - seeing the existing as contingent and the different as comparable.

Keywords: qualitative methodology, functional equivalence, digital libraries

Introduction

Any classification system is arbitrary. It is the observation of sameness in difference as well as the difference in sameness which lies in the eye of the beholder. From a temporal perspective, we can approach the question of sameness and difference as a question of change and flip it upside down. We can ask how different the same needs to be in order to be observed as something new. How do we approach the newness of a socio-technological innovation and its diffusion into society? Observations of technological innovation – be it the cell phone, ERP systems, social networking, and so forth – focus mostly on what is new, easily leading to rhetorics of revolutionary change proposing that nothing will be the same again. While, of course, reporting on those novel aspects of technologically induced developments and, most crucially, pointing out the intended as well as the unintended consequences has a value of its own, this paper will make an attempt to describe a more balanced notion of change and novelty. Taking the librarian discussion on digital libraries as an example, we will argue that the “new” digital library is structurally different from the “old” book library but functionally equivalent.

In the first section, the concept of functional equivalency will be elaborated along the distinctions of organization and structure, system and environment, sameness and difference. Second, the paper will present the difficulties librarianship faces in defining a library in an increasingly digitally mediated environment. Finally, the paper will outline a different approach to conducting research on innovation based on the following three proposals: 1) the general attitude of the observing researcher changes when things turn out to be different *because* they are the same; 2) a research question is in fact an oscillation between two questions; 3) An analytic comparison of “the New” and “the Old” is not a direct comparison by means of analogy but rather requires an intermediary step of abstraction.

Autopoiesis and Functional Equivalence

The functional method goes back to the social anthropology of Malinowski and Radcliffe-Brown who applied this approach to make comparisons across different cultures instead of relying on historical explanations. It also has a long standing tradition in sociology, Durkheim and Parsons being the most prominent figures (Korte 2000; Markus 2004). There are attempts to capture the various streams, traditions, and

reinterpretations of this approach under umbrella terms such as functionalism, structural-functionalism, functional-structuralism, or neofunctionalism. However, we will not delve into the subtleties of the concepts underlying these umbrella terms but rather focus on the comparison of social phenomena according to functional equivalences. The core idea was summarized by Luhmann (1996) as seeing the existing as contingent and the different as comparable. Suffice to say, the comparability of different phenomena depends very much on the level of analysis and point of reference chosen by a researcher.

An important aspect of our argumentation is coming from the concept on living systems developed by Maturana and Varela (1992). A major point introduced in their work is the distinction between organization and structure. The first refers to a pattern or a set of relations *describing* the order and the quality of the system that distinguishes, say, a dog from a cat. The latter is the relations of the physical components – the individual shape of, say, Lassie, probably the world’s most famous dog(s). But when we climb up the ladder of abstraction beyond the distinction of mammals from herpetons or birds, beyond the distinction of bacteria from archaea, to the most abstract distinction of life and non-life, how could we describe living systems? Maturana and Varela’s answer is a *single* operation they call *autopoiesis* – self(re)production. The sameness of all living systems is their specific organisation which “*is such that their product is themselves, with no separation between producer and product. The being and doing of an autopoietic system are inseparable, and this is their specific mode of organisation*” (Maturana and Varela 1992:49). The differences within this unfathomable variety of creatures and individual entities are all expressions of the same, single operation – they are all different structures of the same organisation or, in other words, they are all contingent actualizations of the same potentiality. A dog is structurally different from a human being, a nerve cell from a blood cell, but they are functionally equivalent – the function being autopoiesis.

In his later work, Luhmann (1998; 2006) incorporated the notion of autopoiesis into his analysis of social systems. He proposed that every complex, non-trivial system is autopoietic. Those, being living systems, mental systems, and social systems, are structurally different but functionally equivalent. The self(re)production of each of these systems is based on a different operation that, again, describes and, therefore, distinguishes it from other autopoietic systems. While the autopoiesis of life is based on material self(re)production and of mental systems on the

self(re)production of thoughts, the autopoiesis of social systems is communicative. The operation that distinguishes a social system from anything else is communication. Consequently, Luhmann constructs a radically de-anthropologized theory of society, positioning mental systems and social systems into one another's environment leading to the provocative claim that it is communication that communicates, not human beings (Luhmann 1996).

As a second step, he distinguishes three basic types of social systems; societies, organizations (not to be confused with Maturana and Varela's notion of organization), and inter-action systems. Every autopoietic system is capable of distinguishing between internal operation and external irritation. After all, we are talking about *self(re)production*, hence, a system has to know the self in comparison to its environment. In this sense, system theory is in fact a system/environment theory. In terms of communication, the three types of social systems accomplish this distinction in functionally equivalent ways. A society, for instance, is an all-encompassing, all-inclusive social system. It distinguishes between communication and non-communication in toto (Luhmann 1998). An organization, on the other hand, distinguishes between internal and external communication by constructing social positions in the form of organizational membership with different social roles in the decision making process (March 1991; Luhmann 2000). What about, so called, memory institutions such as libraries if we define them as social organization systems? What makes a library distinct from its environment? What is that single operation that defines a library? In the following sections, we will not try to provide an answer but rather outline a way how to find answers based on the notion of functional equivalence. A conceptualization of the librarian function is discussed in more detail in Marton (2009).

What is a Digital Library?

Librarianship is in a stage of redefining its societal role as guardians of knowledge and providers of information. The Library and Information Science (LIS) community observes and discusses a process of change of librarianship ascribed to the rise of the Internet (Davis and Lagoze 2000); this includes changing user behaviour (Peterson Bishop 1999), the increasing importance of documentation and preservation of online communication, especially in science and research (Ercegovic 1997), and comparisons with new information service providers of which Google is the most

prominent one (Schwartz 2000; Bearman 2006; Bjorner 2006; LiLi 2006). An indicator for the ongoing discussion is the lack for a standard definition of digital libraries (Meyyappan, Chowdhury et al. 2000). Schwartz (2000), for instance, discovered 64 different definitions of digital libraries.

If we compare these definitions with a traditional definition of a library as, for instance, presented by Oppenheim and Smithson (1999:99); “*The traditional library is defined as a specific place with a finite collection of tangible information and it is geographically constrained*”, we may come to the conclusion that either the library does not change a lot or it changes tremendously. Either a library simply includes digital works into their collections and offers corresponding services or it leaves “the place” behind (Oppenheim and Smithson 1999:99) offering any document any time to anyone in any place (Covi and Kling 1996:672) – a library without walls (Lee 2000; Schwartz 2000). Which one to pick depends very much on the focus in terms of what is changing as well as the way we approach change as such (Russell, Weinberger et al. 1999; Higa, Bunnnett et al. 2005).

On the one hand, we can identify the harbingers of doom claiming the end of top-down categorizations conducted by expert librarians. For instance, Weinberger (2007) proclaims the rise of third-order ordering of things when ordering is done by the users themselves through social tagging. On the other hand, we have the harbingers of a new golden age of libraries (Bennett 2001). According to this approach, new technologies, when implemented appropriately, will not only change but solve all the problems of librarianship in terms of storage, preservation, access, indexing, and information retrieval (Graham 2005). Moderate voices, however, introduce a more differentiated view by saying that “[t]echnological progress has changed how libraries do their work, not why.” (Kuny and Cleveland 1996:1).

So what is a digital library? As we will discuss in the next section, we can observe digital libraries as a new form of actualizing the librarian operation. With the words of Kuny and Cleveland (1996), modern libraries and digital libraries are two *hows* of the same *why*.

Methodological Implications

So far, we dealt with the topic of sameness and difference in a rather factual way; this is this and not that. However, in the case of digital libraries, we deal with a process of change, with the digitalization of librarian items and informatization of

librarian services. Therefore, we need to switch to a temporal perspective of “the New” and the “Old”. Following the argumentation given above, the question is “*How do libraries need to change in order to remain libraries?*” By libraries we mean organization as defined by Maturana and Varela, i.e. the operation that makes a library a library, as well as structure, i.e. the contingent actualization taking the form of, for instance, the British Library. In other words, the old – the book-based library – and the new – the digital library – are structurally different but functionally equivalent. The interesting aspect for IS research, therefore, is how a library accomplishes to become a digital library without failing to maintain its core competency – the operation that makes a library a library irrespective of the technologies in place. Librarianship needs to maintain its autopoiesis in the face of environmental changes outlined above. Things need to change in order to be the same. Consequently, research needs to take into account the following points;

First, a different attitude is required from parts of a researcher as one has to be careful not to confuse the two different levels of analysis – organization and structure. If one looked only at the structural level, one would see only the differences and could easily fall into the rhetorics of revolutionary change. If one remained only on the organizational level, one would only refer to the operation of libraries as such without observation of any variety within the librarian domain. On this level, comparison can only be done with other memory institutions such as museums or archives. Research is in fact oscillating between the two levels of analysis, between the case and the abstraction, between empirical data and theory. This is actually nothing new in terms of qualitative research (Bauer and Aarts 2000; Flick 2006; Corbin and Strauss 2008). Functional equivalence does not bring new research strategies or techniques of data collection and analysis along. It merely directs the researcher’s attention to sometimes very subtle nuances when theorizing the data and datafying the theory.

Second, a research question is in fact an oscillation between two different kinds of questions. Take the research question of this project as an example; *how does a digital library differentiate itself from its environment?* In order to answer this question, one needs to, on the one hand, ask; what makes a library a library? That is the question of the function – the unique operation that defines the organization. As reflected in the research question, the approach is not an essentialist but rather a differentialist one (e.g. Heidegger 1969; Derrida 1982; Luhmann 2006). The system library *is* the autopoiesis that differentiates it from its environment. On the other hand,

one has to ask; *how* does a digital library maintain its autopoiesis in a digitally mediated environment. This is the actual level of structure on which one can collect data through, for instance, a case study research design.

Third, a comparison along functional equivalences and structural differences requires an intermediary step of abstraction in order to prevent the analysis to fall into the trap of conclusion by analogy. As history showed us, analogies can be quite dangerous when founded on an ideology. For instance, saying that “society is *like* the human body” is an invalid statement, since one compares systems across different levels of abstraction. If this is not taken into consideration, one might end up looking for the brain of society, the immune system of society, or even for cancerous tumours trying to destroy society and, therefore, need to be destroyed.

In our case, a digital library is not *like* a modern library in an analogical sense. They might be very different from one another but very similar at the same time. Also in a temporal sense, a digital library is not the successor of the modern library – a better, improved version of the old ways of ordering things. The digitalization of libraries is a different way of doing the same. What the same and the different or rather the old and the new is, is the focus of this research project. Therefore, research needs to abstract from the data studied, in order to construct a general operation that describes a library as a library irrespective of technological developments – i.e. the organization library. As a second step, the abstraction can be compared with other data in order to be more refined. The complementary process is the description of functionally equivalent ways of actualizing this abstraction – i.e. the various librarian structures.

Conclusion

The digitalization of librarian items and informatization of librarian services can be seen as a contemporary re-actualization of librarian organization in the face of environmental developments such as a change in societal ways of communicating and publishing, the rise of new players in the domain of information editing and ordering of which Google is the most prominent one, the increasing importance of information technologies, and so forth. Based on the works of Maturana, Varela, and Luhmann, the notion of functional equivalence was discussed in this paper, as a way of comparing the old with the new. This is achieved by seeing, in our case, the old, modern, book-based libraries as structurally different from the new, digital libraries,

but as functionally equivalent. Consequently, research can focus on the structures that emerge in a functionally equivalent way. After all, a digital library is still a library and must not be confused with similar project such as Google Books. In other words, things need to change in order to be the same which leads to the research question as to *how* libraries need to change in order to remain libraries.

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