

Web 2.0 as an autopoietic system - implications for innovative web-interfaces -

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Abstract: The Web 2.0 can be regarded as an evolutionary process of medial differentiation. Infinite online communities are emerging and disappearing. It seems that a race has started in searching for innovative web-interfaces. Already many helpful technological principles and features are executed by web experts. Although they give helpful orientation for designing innovative and interactive web-interfaces, they lack dealing with self-organising systems such as online communities. Therefore, I promote an extended notion of the web-interface. Such perspective includes reconsidering the constitutive characteristic of online communities: the autopoiesis. This is an essential concept of social system theory, which is new in context of designing innovative web-interfaces. Consequently, the goal of this paper is not a technological solution, but which will give a new perspective with implications for technology. One essential consequence is that a designer or programmer cannot be more than a perturbator and experimentator – intending to learn more about the social system. Therefore, I propose to generate knowledge for an innovative and human centred Web 2.0 interface with focus on qualitative and participatory research. This approach allows generating most appropriate design interventions with the users of an online community themselves.

Keyword: communication, media, web 2.0, social systems, autopoiesis, emergence, extended interface notion, qualitative research

1 Background

1.1 The evolution of Communication Media

Internet in general, and Web 2.0 in particular, are often considered to be revolutionary in terms of technology-assisted human communication. Although no one will argue the unprecedented opportunities these technologies provide, a shift of perspective/language from revolution to evolution, in our opinions, will bring valuable implications for the web interface design and beyond.

First of all, since interactive web-services have already existed before, like wikis, blogs or even emails and chat, it might be more appropriate to describe the innovative development of the Web as an evolutionary process. Krippendorff highlights that the evolution of media does not primarily base on technology (Krippendorff, 94) Rather, it starts with the bigger, perhaps the greatest human “invention” of communication media, namely, language, scripts and printing. These should also be considered “invented” media and the evolutionary driver of the differentiation of communication systems.

One might still ask if the Web 2.0 is not a revolution but merely a small step in a slow evolutionary process, what makes it so popular? The main reason, as well known, is that it allows multiple ways of communication across physical or cultural boundaries. This enables already existing communication patterns to appear in a new form—more distinctive and differentiating. The case of collective intelligence, also known as emergence can serve as an example. James Surowiecki (2005) pointed out that the cognitive efforts from a sizable but ordinary group of people, set up arbitrarily, can reach a higher intelligence level than a small group of experts. The main determiner is the social emergence, which develops itself through interactive and individual group work. A suitable analogy of such functioning of social systems is ant colonies. Although a single ant does not get hierarchic instructions, they are well organized. Decisive for an ant colony and a web service is that the social system can auto-organise through participation and collaboration among individuals. However, a group alone is not sufficient to create collective intelligence; preconditions are technological systems, like the well-cited Wikis. These technical systems enable a communicative praxis of social systems, constituted and confirmed by different perspectives and experiences (Willke, 2002).

Therefore, the evolution of the web is better regarded as a self-energising process of media differentiation, rather than an abrupt revolution. More communication needs provoke- more media development and more media provokes exponentially more communication. However, social systems like an online community not only emerge through communication – but also cease to exist without it. If a new online photo sharing community having the same design and technology as Flickr could not attract users who publish photos, the communication on the platform would die. The online community would vanish like so many other internet start-ups. Even with sophisticated technology, it is useful to remind that online communities are disappearing as fast and as often as emerging.

1.2 Problem statement and value

After the first dotcom crisis, it has become clear that technical advancement on Web 2.0-application alone was not sufficient to sustain on-line communities or the growth of Web 2.0. (O'Reilly 05). Since then, many have turned attention to innovative web interfaces. Interfaces of the most successful online communities like eBay, Xing and YouTube are analysed, discussed and recommended.

A race seems to have started to develop principles to help and to instruct how to deal with web technology. For instance, the principle: “End of a software release cycle” (O’Reilly 05) which suggests that software is not any more offered as a finished product, but it gets renewed and actualised daily, depending on usage frequency. This principle might help, but when we look more closely, we realise that the frequency of usages does not tell us anything about the motivation of the user. Maybe the granted features were more comprehensible than others were; maybe there were not other feature what could express better the individual request until now.

Social systems do not emerge primary from technical framework but are the presupposition for already existing needs in society. Pets.com for example invested millions euro in an online shop system to sell cat litter; as the product did not stimulate demand on the market, the company went bankrupt.

It appears, once reached all this technological expertise, to be able to rule over a self-created empire (web-platform) with a modern infrastructure (principles). But the technical basis to build up a platform that is not sufficient. That mainly lies in the fact that the notion of the interfaces leaves out a social and human centred designing components.

2 Social system theory: A new approach for intervention

2.1 A new perspective

Technological features and principles are essential for designing innovative web-applications, but not a condition for an ongoing communication and therefore successes of a platform. They lack dealing with the self-organising system of online-communities. Therefore, I propose an extended notion of web-interfaces that includes reconsidering the constitutive characteristics of an online-community: the autopoiesis.

The notion of the autopoiesis (from Greek: auto - self; poiesis, creation;) describes vivid systems (GLU) which are characterised by the ability to produce and recreate themselves through the elements they are consisted of. This is an essential concept of social system theory. Although this concept is not new but its application in context of designing innovative and interactive web-interfaces has not been explored. Therefore, this paper does not aim at a technological solution but gives a new perspective, which has implications for designing and applying technology, which I consider fundamental. That view helps to know what the design-intervention is aiming at.

2.2 The possibility of design-interventions in social systems

The nature of a social system like an online community is to search for a viable structure. Target control from outside of the social-system cannot be reached, as it is autopoietic and therefore limited by strong system borders (Luhmann, 1991). It only can self-organise and re-produce itself – through communication. Once an intervention is launched into a social system, the designer doesn't have influence on how it will react. The social system can only understand and interpret the intervention through itself. "This avoids the illusion of control (through design) in social systems" (Jonas, 2004). For example, Facebook is a social system, which constitutes a networking effect of communication. It is not possible to force to have many users in it and build up an artificial network.

However, when a designer does not have control over the system, what is the use of design? Here I follow the discussion of - Jonas (2006) who considers designing as an evolutionary process of variation, selection and re-stabilisation. The designer does have indirect influence on the community by generating variation (new and different interfaces) although she does not have control over the interpretation and adoption of the system. "Intervention can only be successful as long as the structural conditions of the specific system are considered (Jonas 2001)". The system is structurally connected with its context (Willke, 2001). Therefore, the contextual components like the stakeholders should be involved to create variations. Consequently, it is necessary to extend the notion of the interface (see Figure 1) to include its context. And the stakeholders of the system is part of the context. This approach allows generating most appropriate intervention for variations with the user themselves. The designer then takes the role of an agent and mediator between the artefactual system (web interface) and the context (stakeholders).

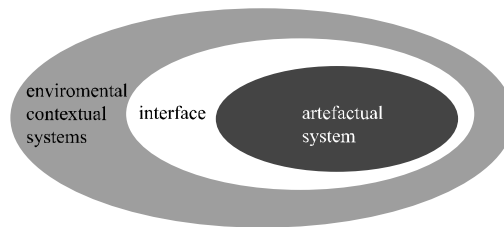


Figure 1: The interface space (white) as the field of intervention (Jonas 04)

As technical development forms and takes part of the interaction of an online community: designing variations for web-interfaces becomes a great challenge. Considering the constitutive characteristics of a social system and being aware of what the design-intervention is aimed at, I suggest following tools for intervention.

2.3 Methodological approach

The methodological approach is qualitative.. The focus lies in concentrating - - on one specific, rather than on many research objects, which will be exemplified later in a case study. It happens inevitably that the researcher regards him- or herself as a part of the observation. Due to the “interpretative paradigm” (Lamnek, 2005) that social reality can only be perceived by interpretation.

The qualitative approach serves to perceive and sensitize to a specific system by observing: regularities, recurrences, noticeable differences, variations and antagonisms. Irregularities are for instance a sudden different salutation of some new members. The way the community system confronts this new communication pattern gives important insights and knowledge about the community itself. As I do not consider the case study out of a scientific, but out of a design researcher perspective, the focus lies in generating variations for interventions. Following the 'Jonasian Toolbox' the innovation primary starts with projections, where the main questions are not concerned with “how it is”, but “how it could be - the ideal” (Chow, 2008). Consequently, I propose not only to analyse but also to generate and to filter intervention for variations with the users (see also 3.2).

In summary, the qualitative research methods help to open up the interface because they help:

- to consider and be aware of the specific community segment
- to inform the design process through active observation and user participation
- to create and to filter interventions closely between the platform and the users

The qualitative approach enlarges the interface space. It supports to adopt more efficiently design interventions between the user requirements and the technological platform – through an iterative process of action and reflection. With the following case, we will demonstrate and exemplify how the concept of the autopoiesis is considered in a redesign of an already existing platform of an online-community.

3 Case

3.1 Design Research Network - Problem description

The online-platform “Design Research Network” (see figure: 2) is a young community, founded in September 2007 for contributions of Design Research. The platform was created to serve the growing number of PhD-Students in Design. Objective of the redesign was to increase usability. Until then the platform was regarded as rigid and overloaded with information. Besides, more appropriate technological features were believed to raise more communication and therefore activate the users.



Figure 2: DRN before the redesign (<http://www.designresearchnetwork.org/drn/node>), 10.1.08.

3.2 Intervention strategy

The strategy was a gradual increase in intervention between active observation and user participation. It must be reminded that social systems, in contrast to technical systems, are incalculable. They can change without premonition. As it is a dynamic system, intervention are always “one shot operation” (Rittel). It is not possible to learn out of mistakes. Every trial counts. If problems emerge, every one is individual. Consequently, a qualitative approach helps to reconsider the autopoietis of a social system. Before initiating irreversible consequences, it was important to get to know the system as profoundly as possible, before launching interventions.

Methods & Tools	Action	Research Purpose	Feedback
Content Analysis	Observing without interfering into the system	Describing the system without interpreting. In order to understand more deeply	-
Participatory Observation	Changing between the position of scientific observing and of participating as user through the whole process	Getting to know the system and developing empathy and sensitiveness	Includes all intervention in the system
Online-Discussion I	Publishing a thought, starting a discussion, from very open questions to more specific questions	Raising gradually a new dynamic in certain direction. Starting with Intervention	16 comments 1283 user-reads
Online-Discussion II			
Final Questionnaire	Sort of paper prototyping of selected features	Let the user decide, which features they prefer	30 participating users
Scenarios	Illustrating possible futures with narrative storys	Giving user elected features a meaningful and desirable context	-
Usertests	Intensive user testing during implementing features in the system	Making the features understandable and usable	5
Qualitative Questionnaire	Exploring new sensation while interacting on the platform	Evaluating user experience	5

Figure 3: Methods used to inform the design intervention

The first method was Content Analysis. The aim was to observe and describe the online community without interfering or changing it. That gave the chance to get deeper insights of its specific characteristics, without judging prematurely. After initial impression of the community, Participatory Observation was conducted. That comprised the changing position between scientific observing and participating as a user. The next step was aimed at evaluating the the perspectives of the users. Therefore, questions were asked about personal experiences with the platform and their concrete wishes for new possible designs and interventions. Figure 3 shows the set of methods applied during the whole design process (see figure 3).

All suggestions were further developed by all participating members and technological advances, which I have examined in between. At the end, all information was collected, categorised and represented in a final paper prototyping with a questionnaire of possible new features. Finally, the most wanted features were illustrated by scenarios. They allowed anticipate possible futures and give the wished features of the users a meaningful and desirable context. These last two methods helped to project, filter and decide for the final implementation phase of the project.

Parallel to the case study I generated knowledge about technological possibilities, for instance analysing existing features and principles of web-experts, successful online communities, as well as searching for trends, user behaviour and needs expressed on online communities. This part of generated knowledge is not part of this paper, as it mainly refers to the individual learning process due to the specific community.

3.3 Results and reflections

The results of the final online-questionnaire have shown that community members were particular interested in new interactive tools. Especially those that allowed users to use the interface without confined to a too rigid content navigation.

Another major interest was a user generated calendar relevant to design events. In this calendar specific events can be selected that might be relevant for the specific community. News about design events that are in put by the users. It was recommended that the calendar would be accessible as a mash up, besides, it could be integrated with external Blogs, as well as the possibility to receive new information by news-feeds.

The next most preferred tool was page views. That supports the confirming feedback of other users. Although a user publishes a contribution and others do not comment it, a great number of page views show an already existing interest of the content. The further wish, to have more possibilities to connect with each other, for instance through same interests, or research themes, serves the need to build up a personal social networking system.

The last most important need was a personalised login. While some users like to have access to all features, others only need a few important functions. This function was combined with the principle of social software (O'Reilly, 2005). Every function was set up like a software window that can be reduced, removed and faded in. This allows adopting the information architecture to serve the individual needs of the users. Figure 4 shows the web-platform after redesigning.



Figure 4: Redesign of DRN; with a more flexible interface according to individual user needs & wishes. (<http://www.designresearchnetwork.org/drn/node>), 10.1.2008.

Partly, I was surprised by the chosen features, for example by the calendar for design events. I had conjectured that the users would vote primary for features which increase usability, like a toolbar to format text or an information architecture which helps to categorise and visualise information as proposed by others. The unexpected outcome made clear that anticipation might lead to inappropriate conclusion. Consequently, it was important to involve the users' expertise.

The whole redesign was a learning process between active observation and a user centred participatory approach. Especially the users helped to understand the specific emergence of the group and to inform the social centred design. Ideas were constituted and confirmed by different prospective and experiences.

4 Conclusions

We have learned that the notion of a web-interface as a strong cut between the users and the community reduces the community to a merely platform for web-technology (cp. figure 5a). Technological applications, features and principles can only procure with a high technological platform but not with a social system like an online-community. For the first step, it seems useful to change the focus on the community and to put it into the centre (cp. figure 5b). The last and final step visualises, that dealing with communities it is useful to consider the vivid dynamic and autopoietic characteristic of the community (cp. figure 5c).

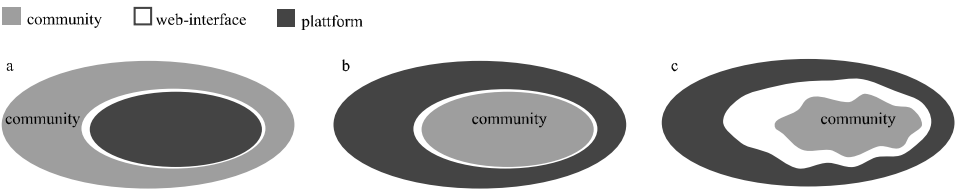


Figure 5: Designing innovative Web 2.0 interfaces leads to dealing with uncertainty of social systems

The extended notion of the interface made it possible to make aware of the constitutive characteristics of a social system: the autopoiesis, which can be compared with an individual collective identity. It is not possible to get direct feedback out of the system or to interfere with it directly; therefore, we had to take care not to interpret any effect prematurely. As the community cannot be interfered with interventions directly, generating variations only seems to make sense by involving the users' expertise and commitment.

After the intensive examination of the platform DRNetwork, the users and the community I came to the conclusion that a human and social centred web interface is set up primary by sufficient standards that gives enough structure and suggestions how to inform and commit communication. Secondly, with an interface that provides enough space and flexibility to adopt to individual needs and expressions (for example direct feedback) of the users. Nevertheless, the expert attitude of an “optimal web-interface” is not reachable. Web-interface can only be appropriate and suitable to a specific user group.

Consequently, dealing with web 2.0 interfaces, a designer can not be regarded as imperator of a new empire, but much more as an agent and mediator among others, interacting and creating design solutions between a steadily changing and evolving social system and its context. But as the future can't be predicted, only anticipated by reactions of the community, the designer (and the solution system) can not be more than an perturbator and experimentator in search for getting more knowledge about the social community.

5 References

- [Al07] Alby, T.: Web 2.0, Konzepte, Anwendungen, Technologien, Carl Hanser Verlag, München, 2007.
- [Co08] Chow, R.: Case Transfer Vs Case Study: An Evaluation of Case Study as a Method for Design Research, Swiss Design Network Symposium 2008 „focused“, Basel Schweiz, 2008.
- [Jo04] Jonas, W.: Research through design – lecture on the conference of the swissdesignnetwork, Basel, Schweiz, 13. und 14. Mai. 2004 http://www.conspect.de/jonas/PDF/Jonas_SDN_Basel_05_04_final.pdf
- [Jo04] Jonas, W.: Mind the gap! - on knowing and not-knowing in design, Hauschild, H M, Bremen 2004.
- [Kr94] Krippendorff, K.: Der verschwundene Bote. Metaphern und Modelle der Kommunikation. In: Merten, Klaus/Schmidt, Siegfried J./Weischenberg (Hrsg.): Wirklichkeit der Medien. Eine Einführung in die Kommunikationswissenschaft, Opladen, S. 79-113, 1994.
- [Lu05] Luhmann, Niklas: Einführung in die Theorie der Gesellschaft, Suhrkamp-Verlag, Frankfurt am Main, 2005.
- [RiM37] Horst W. J. Rittel, Melvin M. Weber: Dilemmas in a General Theory of Planning. Policy Sciences 4 (1973), 155-169 © Elsevier Scientific Publishing Company, Amsterdam -Printed in Scotland
- [So05] Surowiecki, J. / Beckmann, G.: Die Weisheit der Vielen, Bertelsmann Verlag, Berlin, 2005.
- [Wi02] Willke, Helmut: Dystopia, Studien zur Krisis des Wissens in der modernen Gesellschaft, 1. Auflage, Suhrkamp-Taschenbuch Wissenschaft, Frankfurt am Main, 2002.
- [Wi01] Willke, H.: Systemtheorie. UTB für Wissenschaft, 3. Auflage, Stuttgart, 2001.

