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Ideologically-Embedded Design: Community, Collaboration and Artefact

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Summary

Human values in HCI design have been studied in HCI research as additional design criteria, in the Value Sensitive Design (VSD) approach, and as foundations of the design approach itself, in Participatory Design (PD). In both cases, values are seen as properties of individuals, groups and society. This paper introduces the Ideologically-Embedded Design (IED) approach that situates values on the intermediary level of analysis of *communities*. IED is illustrated by the analysis of two case studies of communities, the online epistemic community Wikipedia and the socio-technical system of cohousing projects. In each case, the attendant value systems are described, together with the way that they operate with respect to the co-design process and the design artefact, which corresponds to the community designing itself. The role of values in decision-making and artefact design is discussed. In conclusion, approaches to supporting IED are discussed.

Keywords

Co-design, participation, communities, collaboration, ideology, values, argumentation

1 Introduction

Design of civic systems, e-democracy, and more generally the engagement of citizens in co-design are becoming key issues in HCI. Whereas it is now well established that design is a process of negotiating amongst disciplines, and that design of artefacts is socially-embedded, the consequences of opening up the design process, e.g. by engaging citizens in co-design, are not yet well defined. The main obstacles to involving citizens in design have been mostly linked to favouring effective collaboration (e.g. establishing common ground), as well as representational issues. Since the turn of the twenty-first century, the question of taking *values* into account in design — particularly in co-design and participatory design (PD) — has become an important issue.

Recent research in HCI has taken “values” into account, in the design of systems, in two main ways: Value-Sensitive Design (VSD) and Participatory Design (PD).

In the first approach (VSD), unitary values (such as “privacy”) are mostly considered as additional criteria to be satisfied by the designed artefact (i.e. in addition to criteria such as usability, economy, aesthetics, etc.). The unitary values themselves are ‘inherited’ from the societal level (for example, the value of “transparency” relates to governmental initiatives); and different individual co-designers, working together in groups, may adhere to alternative, conflicting values, to be negotiated. In sum, in terms of the two approaches just mentioned: values have been seen as additional, discrete, design criteria, to be taken into account in the design of artefacts, on individual (designer), group (co-designer) and societal levels.

In the second approach (PD), the vision of design processes *per se* embodies values, such as freedom of participation and voice for all, democracy in bringing together experts and citizens having an alternative form of expertise, and so on. Here, values are again associated to the

(co-designer) group, but more specifically with respect to the (collaborative) *processes* by which it is supposed to function.

To summarise: values have been considered, in VSD and PD, as discrete criteria, on the levels of society, individuals and groups, and in terms of the latter, with respect to its participants and cooperative processes.

Our approach complements and extends existing approaches to considering values in HCI and design research in two ways:

(1) We take values into account as *ensembles*, in systems (or associations of ideas) that we term *ideologies*. As will be reiterated below, we do not understand ideologies as necessarily dogmatic and/or irrational, but simply — and in terms of the literal meaning of the word — as systems of values. Thus, for example, the “open” movement embodies an ideology comprising related values of transparency, democracy, freedom, commitment, engagement, etc.

(2) We address values in terms of a social organisation that is intermediary between the group (perhaps congregated for a single project), the individual co-design participants, and society from which values are inherited, i.e. the *community*. We term our approach “Ideologically-Embedded Design” (IED). A community is literally a group of people bound together by something held in common. What is held in common can be, literally, a ‘thing’, such as shared land or buildings; but usually that is not enough. Historically, communities have also been bound together by shared origins, value systems, or ideologies (clear examples would be religious communities in the early years of the American state, or else kibbutz in Israel). As we shall describe, more recent examples of “communitarianism” include online communities such as “python” or even Wikipedia. Although the latter is characterised by the aim of achieving “neutrality of point of view”, which may appear anti-ideological, we argue that this is nevertheless an ideology (a value system) in that it groups together values of openness, globalisation and neutrality, expressed in explicit rules for the way in which the community should function.

It might be thought that with the fall of the Berlin Wall and the end of totalitarian ideological systems (such as Fascism, Communism) in the aftermath of the Second World War, that modern society is less ideological. We argue that this is not so: the ideological plane has simply been displaced, towards, for example, religious fanaticism, an ideology of “absolute transparency” (cf. Wikileaks), or even globalisation, that propounds a form of ethical relativism or else absolutism (“The Rights of Man”). As we stated above, such value systems are not necessarily dogmatic: what is important is simply that they are in fact systems of values. In the rest of this paper we describe how modern ideologies are played out and impact on societal areas of co-design of socio-technical artefacts, such as Wikipedia and cohousing projects.

The IED approach is more or less salient depending on the nature of the object of design (what is being designed) and its relation to the designers and projected users. We discuss cases where the object of design, the designers and projected users are intimately linked, in the sense that the object of design can be the *community* itself, with its more or less explicit rules embodying values. Thus, a case discussed below is that of a co-housing project or community, with its tangible shared resources and rules for cooperating and living together: the future ‘users’ (those who will live in the cohousing community), the design participants and the object of design are the same. On a societal level, cohousing relates on one hand to community values, such as sharing, and also to ecology; but it can also relate to a different ideology, that of reducing costs and efficiency in use of resources. Such ideologies are what

bind communities together (or else, in the case of opposed ideologies, may lead them to disintegrate) and are implemented by their rules for sharing and living together.

In presenting the IED approach, we will cross the frontiers of design in HCI, by extending the literature review to design of epistemic artefacts, to collaboration in epistemic communities, as well as to the field of argumentation theory (see van Eemeren et al. 1996). The ideologically-embedded design approach will be illustrated by examples from studies of design of artefacts (knowledge objects and socio-technical systems) in two cases: (i) Wikipedia articles; (ii) co-design of social-technical artefacts such as participatory housing (cohousing). In these examples, systems of values act as collaborative principles, objects of the co-design debates as well as forming the ‘cement’ of the participants’ groups. In conclusion, we discuss research issues aiming at the understanding and support of the processes of ideologically-based design.

2 Values in design

It is now well established that design is a process of negotiating among disciplines. Solutions are not only based on purely technical problem-solving criteria, they also result from compromises between designers: solutions are negotiated (Bucciarelli, 1988). Since the 1990s at least, the fact that design of artefacts (knowledge objects, tangible artefacts, digital artefacts) does not only involve fitting with psychological-physiological, aesthetic and economic characteristics of individuals, but must also be socially embedded, has become generally accepted (Schmidt and Bannon, 1992). Part of this vision concerns the role of values in design (Marshall and Erlhoff, 2008): “[t]he designer or design team makes choices at every point in the design process and most of these are value laden. Every decision at each choice point will give priority to certain values over others”. Star (1999) mentions that since Winner (1960) “the question of whether and how values are inscribed into technical systems has been a live one in the communities studying technology and its design as every conceivable form of variation in practice, culture, and norm is inscribed at the deepest levels of design” (pp. 388-389).

Following ethical considerations in HCI, the roles of human values in design have become a major focus of research (for an overview see, for example: Boztepe, 2007; Friedman and Kahn, 2002; Shilton, 2018). Interesting discussions have been presented concerning how values become involved in technological design (e.g. the distinction between embodied, exogenous and interactional positions: see Friedman and Kahn, 2002). Approaches to human values and ethics in design classically distinguished in the literature (Friedman and Kahn, 2002) are Computer Ethics, Social Informatics, Computer-supported Cooperative Work, Participatory Design (PD) and Value-Sensitive Design (VSD).

The objective of this paper is not to develop an exhaustive review of this literature. As our focus is on the design process itself, we will consider the approaches in which values are more or less explicitly embedded in this process, either through design and/or collaborative methodological approaches. Amongst the approaches cited above, we will refer to PD and VSD, completing this overview by integrating research on the analysis of the collaborative design activity.

2.1 Values, definitions, properties

Common definitions of values are, for example: “Principles or standards of behaviour; one's judgement of what is important in life.” (Oxford English Dictionary); “the beliefs that people

have about what is right, wrong, and most important in life, business, etc. which control their behaviour.” (Cambridge English Dictionary).

The concept of value is a core concept in social sciences. Various properties have been distinguished: directing action; characterising individuals, groups and cultures; expertise dependence.

Values are involved in judgements and choices for action. Values are conceptions of the desirable that influence the ways people select actions and evaluate events (Kluckhohn, 1951). This view highlights the role of human values as criteria (for action, choice) rather than as qualities inherent in objects. In Social Psychology, Rokeach (1971) and Schwartz (1994) have developed typologies of values. According to Rokeach (*ibid.*): “a value refers to a desirable end state of existence (terminal value) or a desirable mode of behaviour (instrumental value). Terminal and instrumental values are generalized standards of the means and ends of human existence that transcend attitudes toward specific objects and situations. Thus defined, a person is conceived to have many thousands of attitudes but only several dozens of values.” (Rokeach, 1971, p. 453)

Values can characterize individuals, groups and cultures. In order to pursue cross-cultural studies, Schwartz and Bilsky (1987) proposed a classification based on value content. This finite set of supposedly universal human values is composed of ten types of values, distinguished by their motivational goals, with a structure of relations based on the conflicts and compatibilities experienced when pursuing them. Particular systems of values, as well as the way that they are organised hierarchically, are specific to particular social groups or cultures (Schwartz, 1994).

Values can also be linked to disciplinary expertise. They have been analysed as the meanings underlying viewpoints in collaborative design in concurrent engineering (Martin et al. 2001; Détienne et al. 2005). Priority values for decision-making in designing have been proposed to explain variant and invariant characteristics of designers’ thinking and acting across disciplines, for example in graphic design, architecture, interaction design and engineering (Vieira et al. 2010).

Co-design often involves argumentation concerning alternative design proposals. And the concept of value is also important in the field of argumentation studies. Values are mobilized in argumentative discussions between people, possibly leading to judgements and choices for action or to co-elaboration of knowledge. In language sciences, the notion of value can be found in the distinction between two types of objects/referents of argumentation (Golder, 1996; Golder and Coirier, 1996; Plantin, 2018; Schwartz and Baker, 2016): (a) the category of what is desirable, preferred, composed by values, hierarchies and preferences, termed judgmental or “axiological”; (b) the category of reality composed of facts, truth, and presumptions, termed “referential”. Values may be discussed explicitly in argumentative interactions, or debates, or may take the form of opposed ideological systems underlying the argumentative confrontation as a whole (for example, in the clash between “ecological” and “progress of science” ideologies: Baker, 2015). In predominantly referential domains (e.g. science or engineering), argumentation typically leads to elimination of proposals that have commonly accepted counter-arguments (a form of refutationism), whereas in socio-scientific domains, characterised by strong value systems, participants usually retain their viewpoints whilst further elaborating them and rendering them more concessive, in response to critique (Baker, *ibid.*).

2.2 Current approaches on the roles of values in design

Three complementary approaches on the roles of values in design can be distinguished.

Values as principles of participation in design

Values can be linked to the collaboration process itself. This is the case in processes promoting participatory democracy and open participation in design, such as participatory design (PD), open source software (OSS) communities, Wikipedia and Open Data. Values shape the principles of participation of PD, e.g. equalising power relations. Van der Velden and Mörtberg (2014) position PD as a value-centered design approach because of its ethical motivation, supporting and increasing democratic practices. Similarly, in epistemic online communities such as OSS communities or Wikipedia, values of free participation, openness and peer reviewing are important (Barcellini et al. 2008; Crowston et al. 2008).

Values can also be related to cultural dimensions of collaboration, as in the case of the notion of “culture of collaboration” (Détienne et al. 2012) which affects the various forms of participation in the design process. In this case, values concern how the co-designers relate to each other and the artefact to be designed, for example in giving precedence to either constructing the group itself or else to efficiency in achieving the design project. For example, results from a contrastive case study of French and Japanese engineering students’ appraisals of the quality of collaboration in collaborative design situations (Détienne et al. 2017) highlighted a common French/Japanese culture of collaboration across the engineering students with respect to dimensions of design relating specifically to the domain of engineering, yet significant differences with respect more value-laden dimensions of group work (task/group orientation and argumentation). In a more developmental approach to the study of group engineering projects over a period of six months, Vanhille (2017) showed that there was co-evolution of values of collaboration, forms of participation and co-design processes.

Values as design criteria in VSD

Whereas in the former approach values are linked to the collaboration process itself, other models account for values in relation to the *object* of the design process, e.g. in design decision making. The most well-known approach that addresses values in the design process is “value-sensitive design” or VSD (Friedman, 1996; Friedman and Kahn, 2003; Friedman et al. 2013). These authors have developed a taxonomy of twelve values, that are mobilised depending on the design at hand: human welfare, ownership and property, privacy, freedom from bias, universal usability, trust, autonomy, informed consent, accountability, identity, calmness, environmental sustainability. The approach is focused on values with ethical import related to human well-being, dignity, justice, welfare and human rights. Whereas such values can be considered to be generic, they are evoked differently depending on the culture, the users and the context of use. The methodological approach associated with VSD comprises conceptual, empirical and technical investigations, to both identify values and to prioritise competing values in design trade-offs between technical criteria and value-based criteria. Other research integrates taxonomies of values in specific design methodologies, for example, involving “cultural probes” for elicitation of values (Voida and Mynatt, 2005).

In these approaches, the elicitation and identification of (pre-defined) values is performed in order to account for users’ values or for different designers’ points of view. Thereby, values are additional criteria that inform the design process to ensure acceptability of the artefact (e.g. according to ethical considerations). However, there is no focus here on how values and the design process co-evolve. As Halloran et al. (2009) state “only rarely is the relationship of

values to the design process as it proceeds and unfolds discussed.”. According to Le Dantec et al. (2009), the static nature of value classifications as well as the focus on values of ethical import, even though fulfilling a heuristic role in VSD, does not allow for value discovery in the design process.

Values as objects of grounding and negotiation in collaborative design

In this approach, values are not seen as universal and static, taken from a predefined list. Rather, they emerge from a dialogical process between the various stakeholders in the design process, being conceptualised as objects of negotiation and grounding. Lloyd (2009) and Le Dantec and Do (2009) applied this notion, extended to social and ethical considerations, in order to understand interactions between architects and clients. Lloyd (2009) explored the relation between design thinking and ethical thinking.

Le Dantec and Do (2009) distinguished between *design values* — originating from the designers — and *human values* — originating from the clients. On this basis, they explored the transfer mechanisms of values in interaction, leading to common ground and joint decision making.

Halloran et al. (2009) explored how values emerged and evolved in co-design. They highlighted the relations between values, the evolving technology (artefact) and activities (uses of artefact). They pointed out that negotiated agreement on values is essential, leading to insights for new design exploration. Iversen et al. (2012) propose three phases in participatory design (value-led PD) to support the emergence, development and grounding of values. Based on Vygotsky’s theoretical framework, they proposed to work with participants’ values through mediating artefacts.

In this approach, values emerge in group interactions. However the way design processes and group processes co-evolve is not the main focus. Indeed, values are at the articulation between group processes, design process and the design artefact. They act as objects in the design process negotiation and also as important links between members of the social group(s) involved in this process. Considering this social dimension leads us to explore the notion of *ideologies*, as systems of (beliefs and) values that act as the cement of particular social groups termed *communities*.

3 From values to ideologically-embedded design

To summarise the above discussion of the roles that values can play in design, we have distinguished the following approaches:

1. *Values as principles of participation in design*. Here, values such as “openness”, “equality”, underlie and shape the overall form of participation in design (e.g. open data, writing Wikipedia articles). In sum: *values are in the form of participation*.
2. *Values as design criteria* in “Value-Sensitive Design: this involves being “sensitive” to possible values of projected users of the designed object (e.g. the famous case of googleglasses, that did not sufficiently consider values of privacy and human dignity, once they were used publicly). In sum: *values are in the projected situations of use of the designed object*.
3. *Values as objects of grounding and negotiation* in collaborative design: *values are in the interaction* in co-design involving negotiation between designers and clients/users.

All these approaches embed societal values into the design process. Values are linked to societal issues relating to democracy (e.g. the participatory design movement) or are linked to

societal values attributed to target groups of users, either by the use of taxonomies (as in VSD) or through their emergence in dialogical situations.

Our concern, in this paper, is to examine the design situations in which values are integrated into and are define, to a large extent, socio-organisational systems. In order to do so, we elaborate the concept of *ideologically-embedded design* (IED), which accounts for systems of values (and not unitary values), on the community level in co-design. We distinguish values as design criteria from systems of values, that we refer to as *ideologies*.

IED is distinguished from the above three approaches in terms of the two following main points:

- We consider that values in design are not only to be considered as discrete elements of lists of criteria, nor only as aspects of participation and discussion in design. Our contention is that values in design are more usefully to be considered within systems of ideas and values, i.e. as ideologies. they are hierarchised, but also on the more ‘organic’ level of systems of values. The ‘organic’ or systematic character of systems of ideas and values means that “values” are not simply another class of criteria to be added at the end of a list of design ‘constraints’ or ‘criteria’. Rather, systems of values permeate, underlie and cohere with the ensemble of other criteria for preferring and shaping one design over another.
- We consider that values in design are not only to be situated within relations between design objects, designers and users, but also, crucially, on the ‘levels’ of communities and social groups, within the design activity. The ideological dimension is mobilised at the articulation of design and social group processes, and made visible through their co-evolution. In other words, it acts as the cement of communities and their evolution (reinforcement of social groups or else splitting of them), closely related to the negotiation process.

As stated in introduction, we recall here that by the term “ideology” here we do not mean irrationally held or dogmatic beliefs, but more literally a system (*-logos*) of ideas and values (*idea-*) that are often held by and are the ‘cement’ of particular social groups. Such systems of thoughts, beliefs and values, social and moral ideas or opinions, may be specific to social groups or individuals, and guide action and discourse. Even though often associated with subject matters on politics and power — and therefore political action — this concept has been extended to account for knowledge in the world at large.

Gerring (1997), in a definitional overview of the concept of ideology, highlights specific characteristics, in particular, subject, coherence, functions and subject matters. A central aspect of ideologies is that they are shared by social groups or classes: “Ideologies are group beliefs that individuals borrow; most people acquire an ideology by identifying (or disidentifying) with a social group” (Gerring, 1997, p. 970). They correspond to shared meanings which relate to politics or society.

Gerring (*ibid.*) stresses the importance of *coherence*, of elements of ideas that are bound together. Coherence can be defined as internal, external, and time related. The internal structure of a set of values and beliefs must be coherent in order to be considered ideological. However, coherence may have different meanings (e.g. consistency, system, logical interrelationship) that are stilled debated by researchers. External coherence refers to the contrast between different ideologies: “A value, belief, or attitude is ideological only with reference to something else which is not, or which is differently ideological” (Gerring, *ibid.*, p. 974). Coherence over time refers to stability of a set of values and beliefs over some duration.

The various functions of ideologies are: motivating, legitimating, explaining, repressing, integrated. Ideologies, by connecting ideas and actions, motivate actions as well as legitimating them. They are action-oriented. They provide guides for action and specify a set of issue-positions. Explaining refers to the construction of shared meanings, even at the price of “distortion” as resolution of contradictions. The function of repression relates to propaganda and political ideologies.

Finally, the function of ideologies termed “integrated”, corresponds to a mechanism of social integration or exclusion, and is of interest principally with respect to the social dimension of ideologies. As systems of values and beliefs shared by members of a community, ideologies also function with respect to evaluation of possible integration into communities. Thus, according to Gerring (*ibid.*, p. 972), ideology functions “to bind individuals to a community by establishing an authoritative set of norms and values.” This relates to individuals’ senses of belonging to and identities within communities. This reflects characteristics of communities described in the literature on epistemic online communities (see for example Bryant et al. 2005; Coris, 2007 ; Crowston et al. 2007), in which feelings of belonging are based on shared values and norms.

4 Ideologies, community and design

Our standpoint is that designing artefacts, in particular socio-technical ones, involves taking into account ideologies, *qua* systems of ideas and values, to be understood on the level of communities, as well as that of individuals and groups convened for specific (co-design) purposes. We will illustrate the role of ideologies, both as framing participation and as framing the object of design, in design negotiation, and its possible consequences on the community itself, in two case studies.

(i) *Wikipedia articles*. Ideology enters into design of the Wikipedia community itself, (e.g. values of “open participation”, “neutrality of point of view” NPOV) and in the co-writing of particular articles on controversial issues (e.g. the article on the Turin Shroud, where two types of contributors are in conflict, the ‘scientists’ and the religious people’, or else “Sigmund Freud”, where two visions of “science” are in confrontation). This case illustrates the roles of systems of values of Wikipedia community in framing the collaboration, and the roles of (opposed) systems of values of participants (from religious and scientific communities) in the design of an artefact (the article). We will discuss how the tensions between the Wikipedia ideology of open participation and NPOV and ideologies of participants promoting one particular point of view can lead to ideological battles that have no genuine resolution (i.e. possibility of expressing a single “neutral” point of view).

(ii) *Co-design of socio-technical artefacts* such as participatory housing (Cohousing). Ideology enters into both the collaboration process (based on consensus building) and the design of the artefact — a socio-technical system — that comprises the community itself, its rules and resources. This case shows that internal incoherence between systems of values of members can be revealed in design decision-making (with sometimes the impossibility of finding consensus) and can lead to exclusion of members from the community. Phenomena such as internal conflict and preservation of community values by exclusion of members are clear indicators the role of ideology in community building.

In these two cases, the interplay between systems of values, on community collaboration and on the design object, will have opposite effects: leading to alternative designs and reinforcement of opposed ideologies (in Wikipedia), and binding the co-evolution of design artefact and the community (in cohousing).

4.1 Ideological battles in controversial articles of Wikipedia

With the rise of Internet-based technologies, new web-based communities of practice have emerged (Lave and Wenger, 1991; Hibbert and Rich, 2006), called online epistemic communities (Détienne et al. 2012; 2016). Their *raison d'être* is the co-creation of knowledge objects, semiotic-epistemic entities that can be used to create further knowledge. Examples include open source software (or programming languages) such as “Python” (Barcellini et al. 2008) and online encyclopædiæ, notably Wikipedia. Online epistemic communities originated from a new socio-economic system, referred to as commons-based peer production (Benkler and Nissenbaum, 2006), facilitated by digitally networked environments on the Internet. Here we focus on the case of Wikipedia, with respect to which general public participation has grown very quickly (e.g. Kittur et al. 2007; Suh et al. 2009), in part due to egalitarian principles that encourage free participation by everyone (Reagle, 2007).

In Wikipedia, ideology enters into design of both the communities themselves — for example, via the ideas/values of “free participation” and “neutrality of point of view”, itself hotly debated — and within the production (writing) of particular articles on controversial subjects. Ideology shapes both the structure of the co-working communities and their particular products.

The ideology of participation, adopted by the Wikipedia community, emphasizes the principles of open participation and of neutrality of point of views (NPOV), formalised in Wikipedia policy. It is reified in five main principles (referred to as the “five pillars”¹):

1. Wikipedia is an encyclopedia;
2. Wikipedia is written from a neutral point of view; In particular, articles should be written in an impartial tone that document and explain major points of view, giving due weight with respect to their prominence. “We avoid advocacy, and we characterize information and issues rather than debate them.”
3. Wikipedia is free content that anyone can use, edit, and distribute;
4. Wikipedia's editors should treat each other with respect and civility (in particular: Apply Wikipedia etiquette, and don't engage in personal attacks. Seek consensus, avoid edit wars, and never disrupt Wikipedia to illustrate a point. Act in good faith, and assume good faith on the part of others. Be open and welcoming to newcomers);
5. Wikipedia has no firm rules. However Wikipedia has policies and guidelines, but they are not carved in stone; their content and interpretation can evolve over time.

These principles frame the collaboration. However the second principle on neutrality of point of view (NPOV), according to which no point of view on a given topic should be given precedence over another, becomes quite problematic when the topic of the article is itself controversial. In scientific domains, “neutrality of point of view” is one of their very defining characteristics. But what about matters of social concern, such as whether one form of energy sources is to be preferred over another? Or even whether Creationism is to be put on a par with the Darwinian theory of Evolution? Could there be a neutral presentation of issues of societal concern, or would such neutrality not in fact mask deep-seated oppositions? Certainly, “the facts” are by definition immutable. However, “neutrality of point of view”, the view that ‘the truth’ will emerge from ‘free’ global participation and consensus, if only participants cite their sources, amounts to an ideology, in the sense that we define it, as a system of ideas and values. It could be argued that it is the most or only ‘rational’ ideology, and the one that is to be preferred: but it is no less an ideology for all that.

¹ https://en.wikipedia.org/wiki/Wikipedia:Five_pillars

Having a policy does not ensure that members of a community will play by the rules. This is particularly true for the design of articles on controversial topics in which participants with opposed ideological point of view fight to impose their views in the article, with editing war and disputes in the talk pages. Here the moderators, as guardians of principles and rules of Wikipedia, play an important role in managing ideological battles.

Ideology enters into Wikipedia not only in terms of its community rules, but also in the case of articles on issues that are subject to ideological controversy: what are the regulation mechanisms in such cases, and how do they frame the design/elaboration process itself?

In previous research (Baker et al. 2017), we analysed the evolution of the article “The Shroud of Turin”² in the French language Wikipedia (*Suaire de Turin*, in French), using a narrative approach, whereby highly active “wikipedians” recounted the life cycle of articles in whose writing they had participated, often as non-institutionalised “administrators”. This approach enabled us to have access to more succinct first-person views on group processes in Wikipedia, given the very large amount of data to be considered (debates behind articles may extend over several years). According to one such “wikipedian”, two types of contributors, with strong and opposed ideological systems, were particularly active in the elaboration of the article on the Turin Shroud: “the scientists” and “religious people”.

The ideological battle was conducted both in the edit pages and the talk pages. In the edit pages an editing war occurred in order to try to obtain more ‘territory’ to present particular points of view, challenging the principle of “balance” of viewpoints. In particular, two groups of contributors had opposed points of views on the carbon-14 analysis that was carried on the shroud, which revealed that it dated from the 14th century. The “religious people” retorted that it was possible that the carbon-14 analysis had been done on a piece of cloth that had been used to repair the shroud in the 14th century, although no further fragments are forthcoming that would enable this to be verified.

In the talk pages, disputes occurred on the same topic as well as on more ideological foundations with respect, for example, the notions of faith and evidence (see for example the statement “The Catholic Church considers that Christian faith is not within the domain of proof”, that effectively counteracts the Wikipedia principle of providing “sources” for statements). This reflects what Gerring (1997) refers to as “external coherence”, in terms of values that differ between ideologies. Rather than leading to grounding in a ‘neutral’ point of view, the discussion in Wikipedia had the effect of reinforcing opposed views.

The regulator/administrator attempted to a common strategy for regulating the conflict in Wikipedia, that all articles must strive for verifiable accuracy, citing reliable, authoritative sources. Although one might expect that appeal to ‘sources’, ‘established facts’ or ‘evidence’ outside the debate itself could help to resolve it, this was not the case here, since the “scientists” disputed the validity of the sources evoked by the “religious people”, and the other way around. In effect, the scientists criticised not only the content of sources, but also, *via* personal attacks, the credentials of their authors, their motivations (were not these ‘sources’ created on the fly, simply to support the religious point of view?) and the sincerity of the participants in Wikipedia who evoked the so-called sources. According to the regulator:

“There’s also manipulation of sources. What you see often is that people find a source and errr they can cut it down or distort it ... there are people who even make a source say what it

² “The Shroud of Turin or Turin Shroud (Italian: Sindone di Torino, Sacra Sindone [ˈsa:kra ˈsindone] or Santa Sindone) is a length of linen cloth bearing the negative image of a man who is alleged to be Jesus of Nazareth. It is kept in the Chapel of the Holy Shroud, which is located within a complex of buildings which includes the Turin Cathedral, the Royal Palace of Turin, and the Palazzo Chiabrese in Turin, Piedmont, northern Italy. The cloth itself is believed by some to be the burial shroud that Jesus was wrapped in when he was buried after crucifixion.” (https://en.wikipedia.org/wiki/Shroud_of_Turin)

absolutely did not say ... So we went into a period where we spoke a lot about the manipulation of sources. So you can see the title of the section of the discussion, it's 'Manipulation of sources' ... they wrote articles ... on the scientists ... who had written about the Turin Shroud, in order to show that ... Ermm, it's ... it's a way of trying to legitimate ... If they have an article on Wikipedia, it's that they're legitimate. Err, there you are. So, thereupon, eurh ... there will be collateral effects on other articles. »

Furthermore there were attempts to create articles on the same topic with opposed points of view, as noticed by a contributor in the talk page : “... nice attempt to make a POV-fork called Carbon 14 dating of the Turin Shroud, a barely concealed attempt to push forward their pseudoscientific theories”.

This corresponds to an attempt to make a “POV-fork” (branching out from a disagreement to make another article expressing a different point of view on the same topic), which is explicitly forbidden by the rules of Wikipedia. It is worth noticing that forking is quite usual in epistemic communities such as OSS, as a way to resolve disagreements in the design process: in that case the communities split to create another OSS design project. On the contrary, the ideology of participation in Wikipedia — in particular, the combination of NPOV (Neutrality of Point of View) and the principle of no forking, forces contributors to remain in the same project, in which the ideological battle could go on forever.

We can consider that practices of creating fake sources and the very attempt to “fork” in order to present an alternative (and unique) POV, as reflecting what Gerring (1997) refers to as the function of “distortion of reality”, associated with ideologies, understood in a pejorative sense of the term.

The ‘religion versus science’ ideological conflict discussed above was never really resolved in the Wikipedia article. Rather, it was managed by the strategy of separating out the conflicting views, each of which was accorded its (undisputed) separate section in the article (e.g. “Viewpoint of the Catholic church”, “Scientific viewpoint”). This conflict resolution strategy was implemented by contributors (mainly one of them), who defended the Wikipedia ideology of neutrality of point of view.

In this case of competing ideologies, the process of co-design of the article lead to one artefact with two alternative (and incompatible) POV, instantiated in two sections representing separate points of view with explicit ideological-embeddedness. The negotiation process, being impossible with respect to the content of the artefact itself, rather occurred with respect to the balance of the representation of opposed points of view (and the design artefact including two alternative designs). Ultimately, the dispute was regulated by a guardian of Wikipedia values, managing collaboration and co-production processes. Finally, rather than leading either to even minor revisions of attitudes and system of beliefs (as attested in the Wikipedia discussions), the debate led to the deepening and reinforcement of each side’s (scientific versus religious) ideology.

4.2 Reconfiguration of communities in cohousing projects

In the last decade, many citizens have adopted collaborative consumption (food, energy, transportation, resource) practices. The objectives of these practices, defined by particular societal groups, forming communities, are: 1) to promote sustainable development; 2) to share products, spaces and services; 3) to reuse goods; 4) to reduce waste and to reduce the environmental effects of individual consumption practices; 5) to meet new people and create new social networks (Boostman and Rogers, 2011). These new types of citizen and

technology-driven collaborative systems provoke social and organizational transformations in society. Furthermore, they embody values such as *human values* (equity, trust), *ecological values* (sustainability) and/or *economic values* (reducing consumption by resource sharing). Studies in environmental psychology (Froehlich et al. 2010) suggest that people use these systems and adopt new collaborative practices not only for rational/pragmatic reasons (usefulness, cost, rapidity, etc.) but also in accordance with underlying *ideological values* (sharing values, caring values, etc.).

Participatory housing projects are good examples of this evolution. Cohousing communities are intentional, based on shared values (Renz, 2006) and characterized by a participatory design process (McCamant and Durrett, 1994). In a recent research project (Le Bail et al. 2016; 2018; Le Bail, 2018), we focused on the role of the ideological dimension in the design and evolution of cohousing projects. This was investigated by a field study of three cohousing projects in France, one of them being at an early stage of development. The latter cohousing project was under construction at the time of our study: the land was found but the building permit was still being processed. Group meetings took place every month in order to collaboratively elaborate the future cohousing project and its organisation.

Interviews with co-housing inhabitants, as well as observations of design meetings of the cohousing project in progress, were carried out. Our results showed that the ideological dimension binds together the community itself, e.g. its composition (who can be a member or not), system of decision-making and the design artefact (its architecture, shared resources, rules of behaviour).

In the three cohousing projects studied, the ideology with respect to collaboration itself in the communities was based on consensus building (rather than voting, which crystallises oppositions), reflecting democratic community systems of values such as equity, sustainability and caring. Indeed, consensus is the most represented method of collective decision-making in cohousing communities (Renz 2006; Buck & Edenburg 2012; Endenburg, 1988). It is an objective and a process, a product (the final decision) and a way of achieving this (Renz, 2006), based on discussion, argumentation and negotiation (Wood, 1984). Consensus means unanimous approval (Gastil, 1993). As the opposite of voting, which is based on the majority, a consensual decision is “one that all members have a part in shaping and that all find at least minimally acceptable as a means of accomplishing some mutual goal” (Wood, 1984, p. 4). Consensus requires time, availability, communication skills and commitment to cooperation (Renz, 2006). On a voluntary basis, residents adopt this decision-making process because it reflects community values such as collaboration, sustainability, benevolence or universality. According to them, consensus promotes an open dialogue that helps to build empowered communities.

However, we observed on several occasions that consensus may be difficult to achieve.: what happened in these cases, in particular when there is a tension between the collaboration ideology framing decision making, and participants’ values on some particular issue. We found that moments where people move in or out of cohousing communities are situations where the system of values can be, and often is, debated, with possible tensions, or internal incoherence (for example between economic considerations, ecological values and social values, such as mutual support, kindness, freedom of expression, sincerity). Indeed, recruitment and its organisation could be negatively affected by practical (i.e., financial) needs. When accommodation becomes free (voluntary leaving, exclusion or death) sometimes it is necessary to find money rapidly. We also found that exclusion of members from the cohousing community could be the decision of the community when internal incoherencies appeared between values of individual members. Here we give an example associated with a key event in the community and its reconfiguration: the exclusion of members.

The example is taken from the cohousing design project (the one under construction). The community was faced with a design decision to be made concerning energy sources and use, with respect to which a strong disagreement arose between members. One couple absolutely wanted a boiler in the building where its unit would be, since they did not believe that solar panels would provide them with enough comfort. The rest of the community defended ecological and sustainability values, reified one of the rules of its charter: “reducing the carbon impact by using renewable energies”. This disagreement reveals an internal incoherence in the system of values, between comfort, individualism and ecology and sustainability. The community as a whole failed to reach a consensus on the design decision concerning energy. At the same time it revealed that the couple did not share the values of sustainable practices with the rest of the community. The conflict was resolved by excluding the couple from the community, invoking other infractions of the rules by the couple (e.g. attempts to bypass the collective decision-making process so as to decide alone with the architect). By deciding on such an exclusion from the nascent cohousing community, its members were able to make a consensual decision on the energy design issue, in accordance with both their collaboration ideology and their values concerning the object of design (ecology, sustainability), and at the same time reinforce the shared values of the community itself.

4.3 Summary of case study analyses

Our two cases studies are summarised in Table 1. In these two examples we have tried to distinguish the ideology of the community, with respect to collaboration and decision making, from the ideology(ies) involved with respect to some particular design artefact, in order to explore the interplay of ideologies in design.

In the case of Wikipedia, we highlighted the interplay between: (1) the principle of NPOV and the ban on ‘forking’, framing the collaboration, and (2) opposed ideologies on controversial articles (the Turin Shroud) entailing ideological distortions, editing wars, personal attacks. The conflict resolution, managed by a third party, lead to reinforcement of each side’s ideology and to a design with split viewpoints (an article with two separate sections for each of the opposed POVs). In cohousing case, we brought out the interplay between: (1) the ideology of collaboration, based on consensus building, and (2) internal incoherences of ideologies, revealed in the design of the energy system leading to the impossibility of decision making, resolved by the exclusion of two members, with the effect of reinforcing the shared community ideology.

Table 1. Summary of ideological dimensions in two case studies (Wikipedia and Cohousing)

	<i>Wikipedia case</i>	<i>Cohousing case</i>
Ideology on collaboration, participation, decision making	Reified in five pillars NPOV No forking Universalism (there could exist a single ‘viewpointless’ presentation of all questions) Positivism (true evidence determines the single objective viewpoint)	Consensus building Mutual respect ...

Ideologies on design artefact	Artefact: article the Turin Shroud Ideologies: <i>Opposition</i> between scientific (e.g. evidence) and religious (e.g. faith)	Artefact: energy system Ideology: <i>internal incoherence</i> between ecology, sustainability, sharing and individualism, comfort
Interplay between collaboration and design artefact ideologies	Ideological distortions Editing war (territories) Personal attacks Need of a third party /regulator	Impossibility of making a consensual decision
Resolution: community	Reinforcement of each side's ideology (<i>external coherence</i>)	Exclusion of members Preservation on community ideology (<i>internal coherence</i>)
Resolution: design	One design with split views Balance of point of view	Consensual design (sustainable)

In our two examples we can see that the shift from the notion of values-as-criteria, to the notion of ideologies underlying communities highlights the importance of coherence (internal, external) between values. Here the issue is not one of prioritising competing values, in design trade-offs between technical criteria and value-based criteria, as in VSD. Relationships between values are not binary, with single oppositions between values, but have to be thought of in terms of a more global, systemic, theory of coherence (Harman, 1986). This is a direction to be explored further.

Our examples also highlight the temporal evolution of systems of values, which is not linear, but rather characterised by moments of equilibrium (internal coherence), and moments of disruption. In cohousing, ideology is at the core of the co-evolution of design process and of the community itself. It is in constant evolution, and the system itself can also become an object of debate and negotiation when problems of internal coherence emerge. We have shown that events where people moved in and out the community were particularly disruptive. More generally, what triggers these phases is still to be explored. However, adopting a developmental approach of continuous design could allow the exploration of the co-evolution of systems of values as objects of co-design debates and as cement of the community.

5 Concluding discussion

We have presented cases in which ideological systems globally underlie, permeate, collaborative design of epistemic and socio-technical artefacts. Ideology, in the sense of a system of values (eschewing considerations of rationality and/or dogmatism), can be a two-edged sword in collaborative design of an artefact: it can be a motivation for its design, but can also be a source of strong dissent and verbal conflict, where it is difficult, and sometimes impossible, to find a compromise on an agreed solution. Thus ideology can strongly influence the very composition and functioning of the collective itself.

It is worth noting that the cases discussed above have rather particular characteristics, in the sense that ideology plays a crucial role in the design of the artefact as well as in the co-construction of the community. Indeed, in certain cases, the artefact *is* the community, that aims to co-design *itself*. In the cohousing example, the constructed socio-technical system

integrates the community itself, its resources (technical or not), rules, etc., all of which embed a (more or less shared) system of values.

With our IED approach, we shift from a vision of designing for target users (or representatives) to a vision of designing for and with target groups/communities. What is at stake in the design situation could influence the role of ideology in design. In the Wikipideia example, for certain social groups what may be at stake is (non-)acceptance of a public presentation of an issue with respect to which they have strong value-laden commitments, to the whole world..In the cohousing examples, the question of what is at stake for the participants is central, and is related to issues of engagement, degree of freedom, power, societal, political choices and ultimately the requirement of living together.

Finally, the question arises as to how ideologically-embedded design could be supported. Many methods already proposed in the literature could be quite relevant, in particular those involving stimulating debates not only on criteria but also on values. Debates are not only processes involving exchange of (counter-)arguments, but also function as means for making more *precise* the very questions that are under discussion (Naess, Walton, Sitri), with the competing standpoints. One approach would therefore involve providing tools for enabling disputing parties to express clearly the values and (strengths of) beliefs underlying their alternative viewpoints, which could at least enable examination of the very possibility of the debate being resolved. As systems of values should be thought of not only with respect to the artefact but also with respect to the collective itself, particular techniques such as organisational simulations, role-playing and simulations could be explored (Maier, 2007; Le Bail et al. 2018).

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