

# Designing for Motivation: Focusing on Motivational Values in two Case Studies

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**Abstract.** This paper presents our investigations in how value sensitive design of interactive systems could motivate people to contribute to semantic web applications. In two case studies we adopted the Value Sensitive Design (VSD) framework (Friedman et al., 2006), relying on three levels of investigation. Conceptual investigation focused on the literature analysis and identified a set of motivational values. Empirical investigation involved understanding the motivations of users within two cases. Finally, technical investigation was conducted to determine design features which may support and facilitate these values. This study illustrates the use of the VSD framework for investigating motivational values and provides a review of design features to support end users' motivation to contribute to public goods.

**Keywords:** Motivation, value sensitive design, user participation, annotation, case studies.

## 1 Introduction

The triumph of social web applications (like Facebook, Twitter, Flickr, asf.) pioneered the increasing importance of user contribution in general. Concepts such as "Crowdsourcing" (Howe 2008) or "Swarm Intelligence" (Hinchey et al. 2007) mark milestones on the way to the assumed mass production of public goods. But what does in fact motivate users of web applications to become "prosumers" (Tapscott and Williams 2008) and to contribute their knowledge (personal property) to the (public) swarm?

Recent approaches to semantic web system designs rely on the contributions of end users. Enabling users to annotate different media resources and to provide a piece of additional information is regarded as crucial for valuable content enrichment. Therefore, there has been a growing interest in designing systems that motivate people to participate and to annotate in order to enrich web content (e.g., Zhang, 2008, Preece & Shneiderman, 2009; Cuel et al., 211). The current literature investigates the effects of different motivation strategies (such as intrinsic and extrinsic motivations) on user participation. These studies show that human values and social needs such as the sense of belonging to a community, altruism, fun etc.

play a significant motivational role and thus should be considered when designing systems that motivate user contribution (Kuznetsov, 2006; Farzan et al, 2008).

The purpose of this paper is to report on the results of our investigations which were aimed at understanding the motivational values in two cases and which were to suggest design features for supporting them. This research was conducted within the context of the EU-funded research project INSEMTIVES, whose goal is to bridge the gap between human and computational intelligence in the current semantic content authoring research. It investigates incentive mechanisms to motivate users to contribute semantic annotations, in order to increase the amount and quality of annotations for a broad range of different resource types. The two cases considered in this paper are two different companies, one a telecommunication provider and the other a web service portal provider.

This paper addresses the following research questions:

1. What motivates users in different use cases? Are there significant commonalities/differences between the cases?
2. What mechanism/design features may support motivational values and thus motivate people to annotate in these use cases?

To deal with these issues we took a Value Sensitive Design (VSD) perspective and employed the VSD methodology developed by Friedman et al. (2006). The VSD methodology has been applied in several contexts (Yetim, 2011a, 2011b), including the analysis of Wikipedia for understanding the motivational values of Wikipedians (Kuznetsov, 2006). Our study is design-oriented, searching for design features to support motivational values in the use context. The VSD methodology is used to frame our investigations for both the understanding of and designing for promoting motivational values. The paper contributes to the current literature by demonstrating how the VSD methodology can be employed for investigating motivational values in the context of a design project and by providing a review of design features to support end user motivation to contribute to public goods.

In the following we will first provide a brief introduction into the VSD methodology and clarify how it has been employed in this study. Then we will describe different types of investigations that we have conducted and finally we will present our findings.

## **2 Value Sensitive Design as a Methodological Framework**

The VSD approach (Friedman et al., 2006) is viewed as a viable principled way to systematically considering human values throughout the design and deployment of information technologies (Le Dantec et al., 2009; Yetim, 2011a, 2011b). Methodologically, at the core of the VSD lies an iterative process that integrates conceptual, empirical, and technical investigations.

*Conceptual investigations* involve philosophically informed analyses of the central value concepts and issues under investigation. *Empirical investigations* may focus on the analysis of the social context (e.g. to understand how individuals apprehend

specific values) as well as on the evaluation of a particular design. *Technical investigations* involve proactive design to support values identified during the conceptual investigations and analyzing current technical mechanisms with respect to how they hinder or support human values.

The VSD framework has also been criticized with respect to the order of its basic activities. For example, Le Dantec et al. (2009) argued that the VSD methodology starts with a set of human values as part of the conceptual investigations and then analyzes the chosen value concepts. Instead, they suggest beginning with empirical investigations in the context to identify contextual values to be considered in design. Instead of a fixed classification of values, they suggest the classification of values that were divined from the empirical work. On the other hand, some researchers have argued that the VSD framework does not prescribe the sequence of investigations and is open in this respect (Yetim, 2011a). This means that it is in accordance with the VSD methodology if predefined abstract value categories, identified within conceptual investigations, are combined with local values, identified within the empirical investigations. The value categories can be used as an analytic tool with respect to the locally expressed values, as Le Dantec et al. (2009) state: "*With an empirical investigation shaping the understanding of values, the conceptual investigation becomes a tool through which the designer can reflectively evaluate the values presented through the empirical investigation and those that may be expressed through a more generally defined classification.*" (p. 1148).

This is the way how we employ the empirical and conceptual investigations of the VSD methodology in our research.

### **3 Investigating Motivations from a VSD Perspective**

For investigating the motivational aspects in two case studies we started with empirical investigations to understand the motivational values of the users, i.e., what is it that motivates them to annotate. Simultaneously, we conducted conceptual investigations to identify motivational value categories in the literature. The results of the conceptual investigations, i.e. the value categories, did not influence the empirical investigations. Instead, they were used for the analysis of the data collected within the empirical investigations. Yet, for presentation purposes, we will first introduce the categories of motivational values that were derived from the literature analysis as part of our conceptual investigations, and then present the results of our empirical investigations in two case studies, in which these categories were used to analyze the data. Finally, we will present the results of our technical investigations that were conducted to determine design features that may support or facilitate the values. In other words, starting from what we know about what motivates people individually and collectively in our design contexts, we analyzed the state of the art knowledge to identify and suggest relevant design features or mechanisms (cf. Cuel et al., 2011).

#### **3.1 Conceptual investigations**

Several studies indicate that motivational values play a significant role in motivating people to participate. For example, most people value their own welfare and are

motivated to increase it when opportunities to do so arise. Goals that are valued induce motivation directed towards achieving these goals (Batson et al, 2002). The current literature offers a set of motivational values. For example, Batson et al. (2002) differentiate four types of motivation for community involvement: *egoism*, *altruism*, *collectivism*, and *principlism*. The differentiation is based on the ultimate goal for each motive. For egoism, the ultimate goal is to increase one's own welfare; for altruism, it is to increase the welfare of another individual or other individuals; for collectivism, the goal is to increase the welfare of a group; and for principlism it is to uphold one or more moral principles. Kuznetsov (2006) states that the motivations of Wikipedians to contribute are grounded on values such as *reputation*, *community*, *reciprocity*, *altruism* and *autonomy* (see also Wagner and Prasarnphanich 2007). Hars and Qu (2002) show that *altruism* and *identification with a community* as internal motivation factors played an important role for participation in open source projects. Also Wasko and Faraj (2005) found that increasing professional *reputations* motivate people to contribute their knowledge. Oreg and Nov (2008) considered the categories *reputation-building*, *self development*, and *altruism* in the context of open source projects and showed that software contributors placed a greater emphasis on *reputation-gaining* and *self-development*, whereas content contributors placed a greater emphasis on *altruistic* motives. Fang and Neufeld (2009) provide other categories of motives, including *software use value*, *status and recognition*, *learning*, *personal enjoyment*, *reciprocity*, *getting paid*, *sense of ownership and control*, *career advancement*, *free software ideology*, and *social identity*. All of these values are potentially relevant and therefore may be used as *ex post* categories to analyze and interpret the results of the empirical investigations in order to understand which values dominate in the fields studied, as presented next.

### **3.2 Empirical Investigations**

The empirical investigations consist of two case studies conducted with a telecommunication provider and a web service portal provider. For reasons of confidentiality, we refer to them as Telco Corp case and adfind case.

#### **Telco Corp. Case**

##### *Purpose and Method*

The first case study was conducted with a telecommunication provider located in Spain. The overall purpose of this investigation was to understand how semantic annotation tools can be helpful for users to organize and locate content within their work context and what motivates them to actively participate in semantic content creation.

For this purpose, we organized an interview session and a focus group. We first conducted the interview session with 11 representative employees (Head of departments, project managers, developers, etc.). Each semi-structured interview took about 1 hour and was divided into four major issues, dealing with the understanding of (a) existing communication processes and – entities, (b) existing usage practices to retrieve information/knowledge, (c) benefits and problems with respect to semantic

annotation mechanisms that can support information retrieval, and finally (d) factors that motivate or would motivate people to participate actively in semantic content creation.

After the interview session, we arranged a three hours focus group workshop with five participants. The goal of this workshop was to find out how appropriate semantic tools would look like and what would motivate users to use them. In this workshop, participants first conducted a scenario-oriented walkthrough and also completed work related tasks by using the existing content and knowledge management systems of the company. We used the thinking aloud and constructive interaction methodology and the constructive and critical comments of the users were recorded. After the scenario-oriented walkthrough, the participants discussed what tools or techniques can help in order to find information more effectively and efficiently. They also discussed the problem of participation, i.e. what can motivate employees to actively contribute in semantic content creation.

The results recorded through interviews and workshops were transcribed and analyzed. This paper focuses only on the results related to motivational aspects. Two of the authors interpreted the related data separately and assigned them to the motivational value categories mentioned before. They also discussed their different interpretations and came to the following findings.

### *Results*

*Community* support was mentioned by some interviewed participants as one of the main reasons for why they would contribute. Two of the interviewed participants emphasized the relevance of community for them. One of the participants stated that the internal network is very strong in their group and that people would tend to help each other as much as they can. One interviewee emphasized the usefulness of expert allocation support to locate contact persons to specific knowledge, documents or technologies more easily and pointed out that he would annotate or add additional information to make this work.

*Reputation* was also a relevant motivational value for some users as they expressed their desire to gain recognition from others in their company. One of the participants indicated that a strong incentive would allow users to build a reputation in a certain area, for example, when switching projects (which happens often for Telco Corp. workers) they could be channeled towards activities they actually like.

*Self development* through learning from the annotations of others was highly valued by several participants. In particular, they emphasized the importance of the usefulness of annotations. For example, one participant stated that the annotations would allow him to find information from other projects more easily in order to enhance the collective knowledge. Another participant would be motivated to use annotation tools if such tools allowed him to track the expertise of people in an area based on the content they generate.

*Personal enjoyment (or having fun)* during annotating was also desired by one participant in our interview. He stated that the “entertaining” side of the tools is very important to him in order to be motivated to use the annotation tools.

Finally, the expectation of *self benefit* can also be regarded as a reason for using the annotation tools. We could infer this indirectly from the statements of some participants. For example, one participant stated that he would not use the annotation tools as he could not see any benefits in annotating and regards using them as a “waste of time”. Another participant, who could also not see any value in using annotation tools, stated that he would only use the tools if annotating was their main job.

## **adfind Case**

### *Purpose and Method*

The second case study was conducted with a web service portal provider located in Austria. The main purpose of this study was to find out how semantic annotation mechanisms can improve web service search engines and what can motivate users to actively participate in semantic content creation. Like the study before, we organized an interview section and a focus group. We first conducted the interview session with 8 participants. Half of them were staff members of the portal provider and the others were developers, who frequently use web service search engines. Each semi-structured interview took about 1 hour and was divided into four major issues, dealing with the understanding of (a) the general work tasks (if staff member) and the reason for using web service search engines (if developer), (b) the existing usage practices of web service retrieval processes, (c) semantic annotation mechanisms to improve retrieval processes, (d) motivation factors for participation in semantic content creation.

After the interview session, a two hours focus group workshop was conducted with 14 participants, including staff members from the portal provider and external developers, who are experienced web service users. We presented the existing web service search engine to all participants and discussed shortcomings of the existing search engine, as well as ways for overcoming them, or how semantic annotation tools support web service retrieval processes, and finally, what motivates users to actively contribute to semantic content creation.

The results recorded through interviews and workshops were transcribed and analyzed. Two of the researchers came up with separate interpretations of the comments related to motivational aspects and assigned them to the motivational value categories. They discussed their different interpretations and came to the following findings.

### *Results*

*Self-benefit* was of particular importance for motivating participants in this case. The data showed that all participants would annotate web services to reach a personal goal, even though their goals differed. In a commercial context service providers/developers usually have the goal of selling as much web services as possible (in the case of open source, they may also aim to make web services popular – which is related to the reputation value, as discussed below). One participant, for example, annotates his own web services by providing a detailed description and specific tags in order to make them more visible and searchable for web service

consumers. Web service consumers use annotation tools mainly to enhance their personal web service retrieval processes. Another participant mentioned that he would not mind if others saw his tags, but he uses tags for making bookmarks to find visited web services more easily and faster. Another interviewee pointed out that there must be an extra value for consumers in order to enrich web service descriptions. To get extra access to withhold information or functionalities would be a valuable mechanism. For example, one annotation would enable users to search for additional three times or for a specific amount of annotations the user will see related web services, from which the consumer might benefit.

*Community* has also appeared to be relevant. In fact, there does not exist any visible community around the web service search engine, yet, the interviews as well as the data from the focus group session indicate that a community would foster the motivation to actively contribute to semantic content creation. Two participants, non-commercial web service developers, stated that it is important for them to give something back to a community, especially, if they have already profited from the work or knowledge of that community (e.g., web service recommendation). Another participant also pointed out that he would be more willing to spend time on annotating web services, if others also contributed.

*Reputation* has played a significant role especially for those people who have been part of a community. For web service developers of a company, it is important to gain a good reputation. One participant stated that he would value the possibility to make his own web services more visible within the company by using annotation tools. Another interviewee pointed out that allowing one to change the status from newcomer to experienced developer or user can motivate them to participate.

*Self development* was desired and articulated either directly by emphasizing the need for personal development or indirectly by emphasizing the need for appropriate instruments that may be helpful for personal development. As already mentioned in the description of self-benefit, one interviewee explained the benefit of getting extra information or functionality, after making a specific amount of annotations. During the focus group several participants emphasized the value of retrieving expertise from other developers through annotations and all participants agreed to have benefited from the annotation immediately.

Finally, *personal enjoyment (or having fun)* during the annotation process was also emphasized by some participants.

## **Summary**

The two case studies show some similarities with respect to their results, i.e. with respect to motivational values. In both cases we found indications for five values: *reputation, self-development, self-benefit, community, and personal enjoyment*. Yet, we should mention that each of the values cannot be strictly separated and that participants can value several things simultaneously. For example, as one participant state, he would annotate first of all for himself but would not mind if others saw the tags and liked it if they were useful to them. This expresses both self and community benefits.

Despite the similarities between the results of these two cases, we do not claim that there would not be any differences if we had involved more users than the limited number of users we actually interviewed. Moreover, as user communities can change, there may also be other values which we were not able to identify in our groups. Nevertheless, what we can claim based on our findings is that the motivational values identified in our cases are good starting points to investigate in how they can be supported by means of technology, as presented in the following.

### 3.3 Technical Investigations

As part of the VSD methodology, technical investigations involve activities in which designers bring to bear state-of-the-art knowledge on design specifications that might be used to realize given values within the context of a design project. Accordingly, we will consider the state-of-the-art knowledge on technical mechanisms or design features and suggest some ways for supporting and facilitating motivational values in our contexts. The suggested features may have already been realized and tested in some existing prototypes or may be untested ideas and thus be of hypothetical nature. Whether their implementations support the motivational values remains an issue of evaluation after the implementation, an issue which has not been addressed in this paper.

Table 1 summarizes the motivational values identified in both cases as well as the design features identified in our literature analysis. Some of the features may be case-specific, whereas others can be applied in both cases. Yet, due to the limitation of space, we will not discuss their appropriateness for each case independently and in detail. We should also note that some features mentioned can simultaneously support multiple motivational values such as self-benefit and community benefits.

**Facilitating Reputation Building:** A number of mechanisms have been suggested that can motivate people based on the value of reputation. One design feature that promotes contributions is visibility to the community. The contributor can be identified by a login name. This visibility offers contributors recognition that adds to their social presence online (Preece & Shneiderman, 2009). This has been observed to motivate tagging on Flickr (Ames & Naaman, 2007; Nov et al., 2008) and to increase editing contributions on Wikipedia (Nov, 2007), in turn, creating a growing reputation (Farzan et al., 2008). A way to increase credibility was observed in the community of Wikipedia (Forte et al., 2008). That members invest more of themselves in the community can be seen through their presence on multiple discussion channels, such as discussion pages, meta-pages or mailing lists.

Registered contributors to Wikipedia develop online identities in order to be respected, trusted, and appreciated by their peers (Kuznetsov, 2006). A reputable identity is rewarding as it signifies success and accomplishment. Registered users can develop elaborate online profiles in their User Pages. Many Wikipedians include links to articles they have previously worked on, which allows other users to learn quickly about each other's interests and level of expertise. Furthermore, users can nominate and award contributors with distinguished work. Outstanding articles can be listed as "Featured Articles" on the front page of Wikipedia, similarly, useful portals can be listed as "Featured Portals". Users who contributed to Featured Articles and Featured

Portals acquired a respectable reputation as their work was rewarded by the community.

The evaluation of the quantity and quality of the contribution of others as well as celebrating status seems to be important. It has been argued that relative rankings of contributions strongly motivate contributions to information repositories (Cheshire and Antin, 2008). Some systems provide a way for people to recognize and evaluate another's contribution. For example, eBay's rating system allows purchasers to rate vendors according to the condition of the goods purchased, the timeliness of delivery, the quality of the purchase, and so on (Cheng and Vassileva, 2006). Another example was introduced by Farzan et al. (2008), a point-based rewarding-system within a social-network system. While the designed mechanism motivated participants to contribute more to a social network site, they pointed out that it is important to analyze for each individual social network, what action (e.g. posting a photo, making comment, etc.) leads to which amount of points. As their study showed, decay functionality, as well as the opportunity to adjust the point system to the user's behavior of factors on the site, are crucial functionalities. Variations on this theme involve rating people's ratings, awarding points or rewarding contributions with money (Kollock, 1999; Hars and Qu, 2002; Hummel et al., 2005; Cheng & Vassileva, 2006; Farzan et al., 2006).

Flickr (<http://www.flickr.com>) addresses user reputation by highlighting specific content, e.g. "the most interesting photos." (Wasko et al, 2005). Reality shows; talent competitions; YouTube, blog; and Flickr posts of pictures are all manifestations of the need to be noticed. Thus, recognizing and rewarding contributions and, in so doing, enabling the contributors to stand out are techniques used by researchers and designers to encourage online contributions (Preece & Shneiderman, 2009).

| <b>Motivational Values</b>   | <b>Supportive Design Features/Mechanisms</b>  |
|------------------------------|---|
| <i>Reputation(-building)</i> | Visibility to the community<br>Multiple channels<br>Building reputable online identities<br>Point and status reward systems   |
| <i>Self-benefit</i>          | Feedback through rating of actions/choices<br>Explaining self-benefits  |
| <i>Self-development</i>      | Rewarding through access to extra information<br>Incenting by tagging awareness   |
| <i>Community</i>             | Promoting reciprocity<br>Explaining community benefits<br>Informing about the beneficiaries of contributions<br>Incenting by goal-setting<br>Rewarding cooperative behavior<br>Social comparison through visualization of contributions |
| <i>Personal Enjoyment</i>    | Integrating fun features<br>Packaging the task as a game  |

**Table 1.** Design features for supporting motivational values

**Facilitating Self-benefits:** There are also mechanisms that can support the users' need for self-benefit. Hars and Qu (2002) showed that the personal need for a software solution is a key factor. Some approaches motivate users to participate by turning their feedback into an activity that is important and meaningful to them. For example, Farzan and Brusilovsky (2006) utilized student ratings of courses in a course recommendation system to show their progress towards their career goals. This approach assumed that the main goal of students is to take courses that help them to find an interesting career in the future. The rating of the relevance of courses enables students to observe their progress towards each of their career goals (Farzan et al., 2008).

There are also studies that argue that explaining self-benefits of an activity can motivate users to do the activity. Beenen, et al. (2004) applied this principle to the MovieLens system to address the problem of under-contribution. They studied the effect of revealing to the user the uniqueness and benefit of their contribution. Their result showed that users were more likely to participate when they were reminded about their benefit and the benefit of others (Farzan et al., 2008). Also using the MovieLens system, Rashid et al. (2006) studied the effect of identifying the beneficiary of a user's contribution. Their results suggested that how much the individual identifies with and likes the group correlates with the user contribution level to the community.

Thus, we conclude that the system should provide immediate feedback to the users with respect to the benefits or other positive effects of their contributions for their self-interests.

**Facilitating Self-development:** Reward mechanisms have been built in several systems to support the users' desire to receive something for their contribution, which promotes their self-development (Farzan et al., 2008). For example, the Comtella system (Bretzke & Vassileva, 2003) rewards more cooperative users with incentives such as a greater bandwidth for downloading or a higher visibility in the community. Hummel et al. (2005) showed that announcing extra personal access to specific information as a reward for participating actively triggered increases during their experimentation. Participants continued to contribute after the reward was withdrawn.

In addition, Thom-Santelli et al. (2008) suggested a mechanism for higher-quality tag recommendation in relation to the users' role. They pointed out that users need to be able to see tags they have used within systems and across systems, and that the current visualizations of one's tags and the body of tags within a system (e.g. tag clouds) are not appropriate in meeting this need.

**Facilitating Community Building:** Wasko and Faraj (2005) argued that giving something in return to the community for its help was by far the most cited reason for why people participated. Reciprocity facilitates the creation of a community. For example, Kuznetsov (2006) showed that Wikipedia creates a community of contributors, which is subdivided into smaller spheres that unite people by area of interest, background, age, political opinion, etc. The community fosters a motivation to contribute by sharing information and thus helping the collective to which one belongs. The Wiki technology entails many tools such as "Community Portals",

“Collaborations”, and Discussion Pages, which encourage Wikipedians to work together, thereby causing them to meet other members with similar interests. Through this cooperation, Wikipedians develop a connection to other contributors and begin to feel needed by the Wikipedia community.

Several studies emphasize the significance of *explaining community benefit for the motivation* (Rashid et al, 2006; Farzan et al., 2008). According to the “collective effort” model people are more likely to work hard if they feel their contribution is important or identifiable to the group (Ling et al. 2005). Ling et al. showed that email messages explaining the value of a contribution caused members to contribute less as compared to those whose messages did not mention value at all. In the context of the MoVieLens system, Breenen et al. (2004) showed that users are more likely to participate when they are reminded about their benefit and the benefit of others. Thus, a system should provide information about effects or benefits of a contribution for the community, while annotating documents or information.

Rashid et al. (2006) found that how much the individual identifies with and likes the group correlates with the user contribution level to the community. They suggest that designers can use information about the beneficiaries of contributions to create subtle and integrated messages to increase motivation.

Some studies emphasized the relevance of *goal-setting* for motivating contribution in online communities. For example, Beenen et al. (2004) conducted an experiment in MoveLens, and their results showed that specifically challenging goals resulted in a higher number of ratings and that group goals stimulated a higher contribution than did individual goals. Beenen et al. (2004) concluded that designers should be more specific about assigning goals or providing opportunities for individuals to declare contribution goals for themselves. The application of the goal setting theory can be observed in social-networking sites such as LinkedIn (<http://www.linkedin.com>) which provided information about how complete a user’s profile is (see Farzan et al., 2008).

Another approach to address the users’ desire to share information with the community has been realized in the context of Comtella. The system allows the members of an online community to share web resources amongst each other and rewards more cooperative users (Bretzke and Vassileva, 2003; Cheng and Vassileva, 2006).

Motivating social comparison in the quality of the contributions, comments, and ratings is an interesting approach. Vassileva and Sun (2007) showed that the visualization effectively encouraged social comparison and competition, which resulted in an increased participation. This means that designers can encourage user participation in desired activities by showing a representation of the contributions of the community members along these activities.

Finally, there are many other factors that may have a motivating effect: For example, a welcoming environment, safety, support for newcomers, and contacts to ask questions (Preece & Shneiderman 2009) as well as telling participants that their contributions are valued because of their expertise (Ling et al., 2005).

**Facilitating Personal Enjoyment:** Personal enjoyment or fun has been viewed as a separate design space. According to Shneiderman (2004), designers must address three important goals that contribute to fun-in-doing: (1) provide the right functions so that users can accomplish their goals, (2) offer usability plus reliability to prevent frustration from undermining the fun, and (3) engage users with fun-features. Fun features such as alluring metaphors, compelling content, attractive graphics, appealing animations, and satisfying sounds can promote user engagement.

Game approaches are the most popular ones to motivate people based on fun and intellectual challenge as the predominant user experience. Games package a task as a game to use the computational power of humans (von Ahn, 2006). They are significant features of a system that motivates people. Players have the incentive of playing a game that is competitive and entertaining and at the same time produces useful semantic annotations. The task of annotation is thereby well hidden behind a motivating concept and an extremely simple interface. There are different options for designing incentives-driven game tools. Example games are described in (Siorpaes & Hepp, 2008), including games for the construction of ontologies and the semantic annotation of data (OntoTube and OntoBay). For example, OntoTube is a two player quiz game for annotating videos. Both players have to answer questions about the video, and the answers are used for data generation.

## 4 Conclusion

In this paper, we have presented the results of our research aiming at the value sensitive design of semantic web applications in order to motivate people to contribute to semantic web contents. By adopting the VSD framework which distinguishes three levels of investigation, our approach started with empirical investigations to understand what motivates people in two application contexts. Then we suggested some design features that would support those values and thus motivate users. Our study contributed to the current research and practice by illustrating how the VSD can be employed for investigating motivational values and by providing a review of design features to support end the users' motivation to contribute to public goods. Researchers may use the VSD methodology in the way advocated here to conduct further research. Practitioners may implement design features suggested here and evaluate whether they support motivational values as claimed in this paper.

Yet, the research has also some limitations due to the limited number of participants involved in both empirical studies. So, we cannot claim with certainty whether values other than those identified here may or may not play a role in these contexts. In addition, as user communities can change, there may also be emerging values. Finally, our claims that the suggested design features may support the motivational values are of hypothetical nature. The features need to be implemented and tested in both application contexts. This will be one of our future research efforts. All in all, we conclude that incentives enable and motivate a particular course of action. To understand the motivational values present in the application contexts is a good starting point to designing systems that motivate.

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