

Value-Sensitive Design for Cross-Enterprise Regulation*

Sietse Overbeek, Virginia Dignum, and Yao-Hua Tan

Faculty of Technology, Policy and Management, Delft University of Technology,
Jaffalaan 5, 2600 GA Delft, The Netherlands, EU
{S.J.Overbeek,M.V.Dignum,Y.Tan}@tudelft.nl

Over the past several years, the business community has devoted considerable attention to corporate responsibility, in order to address significant social and environmental questions with value for business and society. Organizational activities are expected to be transparent to governments, investors, and other stakeholders. Enterprises, governmental institutions, and the public in general benefit from well-defined and well-enforced laws and legal guidelines, in order to protect companies from manipulations of financial reporting data. Traditionally, control and enforcement were government tasks, however, the advent of sound IT support and the increasing cost and complexity of regulation are leading towards collaborative regulation between enterprises and governments.

Regulation of organizational processes is based on the norms that organizations have to comply with. A *norm* can be defined as standard behavior that is acceptable for the regulating institutions, indicating desirable behaviors that should be carried out as well as undesirable behaviors that should be avoided [4]. *Norm enforcement* mechanisms are used to determine if organizations have complied to the *norms* that they should satisfy [1]. If norms are to be enforced, then the institution should specify and handle sanctions for every possible violation of the norms. This means that enforcement mechanisms often require the introduction of special ‘regulator actors’ that actively monitor the behavior of the other agents [1]. Such agents are assigned to monitor the behavior of organizations and sanction them in case of norm violations. Implementing self-regulation as a control mechanism results in a redistribution of control tasks among the actors.

Which enforcement mechanisms are effective and how sanctions are likely to be followed is directly related to the values of an organization. Moral values are the standards of good and evil that guide an individual’s behavior and choices [5]. Individuals, groups, and societies develop own value systems used for the purpose of ethical integrity. The value notion and the two mentioned different types of norm enforcement mechanisms can be combined to design a *value-sensitive system* that supports agents in *norm fulfillment* and *norm enforcement*. Value Sensitive Design (VSD) is a methodological design approach that aims at making moral values part of technological design, research, and development [2]. Values are typically high-level abstract concepts that are difficult

*Published as: Overbeek, S., Dignum, M., Tan, Y.H.: Value-sensitive design for cross-enterprise regulation. In: Proceedings of the 1st International Workshop on Cross Enterprise Collaboration, People, and Work (CEC-PAW10) held in conjunction with the BPM 2010 Conference, Hoboken, New Jersey, USA, September 13, 2010.

to incorporate in software design. In order to design systems that are able to deal with moral values, norms must be operationalized while maintaining traceability of its originating values. This change calls for architectures that satisfy the following principles: (1) coordination policies need to be described at a high level of abstraction; (2) the enforcement needs to be negotiated between governments and enterprises; (3) coordination policies need to be formulated explicitly rather than being implicit in the interactions; and (4) it should be possible to deploy and enforce a policy incrementally.

An increasingly important value in organizations is that of *ethical and transparent business practices*. The development of codes and standards for ethical and transparent business practices can help limit corruption, ensure fair and open competition, and encourage a better business environment. A formalism for values must be able to describe and reason about social structures and interactions, facilitating analysis and verification through logical reasoning. Moreover, in open systems where agents are assumed to be autonomous and rational, agents can, involuntarily or by deliberate choice, violate social norms and regulations and therefore one must be able to deal with and reason about such violations. In normative systems, interactions between actors are regulated by normative templates that describe desired behavior in terms of deontic concepts such as obligations, prohibitions, permissions, deadlines, violations and sanctions [3]. Deontic logic provides mechanisms to reason about violability of norms, that is, about how to proceed when norms are violated.

The results of our research provide the basis for a value-sensitive system to support actor agents in norm fulfillment and regulating agents in norm enforcement. This foundation has been laid by applying a value-sensitive system development process and by incorporating the principles of the norm enforcement mechanisms of direct control and self regulation in the system design. By following this specific system development process, the value that is created for the agents that apply the norm enforcement mechanisms of direct control and self regulation is explicitly incorporated in the development of the system.

References

1. Burgemeestre, B., Hulsteijn, J., Tan, Y.H.: Towards an architecture for self-regulating agents: a case study in international trade. In: Proc. 2nd Multi-Agent Logics, Languages, and Organisations Federated Workshops, Italy. CEUR Workshop Proceedings, vol. 494 (2009)
2. van den Hoven, M.: Design for values and values for design. *Information Age +*, *Journal of the Australian Computer Society* 7(2), 4–7 (2005)
3. Jones, A., Sergot, M.: A formal characterisation of institutionalised power. *Journal of the IGPL* 4(3), 429–445 (1996)
4. Meneguzzi, F., Luck, M.: Norm-based behaviour modification in bdi agents. In: Sierra, C.e.a. (ed.) Proc. 8th International Joint Conference on Autonomous Agents and Multiagent Systems (AAMAS 2009), Hungary. vol. 1, pp. 177–184 (2009)
5. Scott, E.: Organizational moral values. *Business Ethics Quarterly* 12(1), 33–55 (2002)