

A Platform for Studying Progressive Self Management in Online Communities

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Introduction

The World Wide Web is witnessing an explosion in new forms of online communities enabled by advances in user-created content, social networks and by leveraging the Wisdom of Crowds (Porter 2004). These advances are empowering online communities to move from mere discussion fora to viable, value-generating organizations or value networks. Value networks are composed of individuals or organisations working as peers, independent of the control of any single enterprise. Members derive value from the rapid and targeted growth in intellectual and social capital that networks can offer compared to traditional forms of organisations, hence there is a growing recognition of the economic and social importance of web-mediated value networks (Allee 2003).

To engender member trust and encourage their commitment to value creation and problem solving, value networks must be self-managing, i.e. management decision-making should be conducted in a collective, participative manner free of centralised control by a single member. To be viable in the face of technological, organisational, economic and social change, value networks must self-manage in a progressive manner by continuously monitoring, reflecting upon and learning from the impact of management decisions.

However, in web-mediated value networks such progressive self-management is severely hindered by the management capabilities offered by contemporary web communication and collaboration platforms. These capabilities typically retain management abstractions developed for centrally-administered enterprise IT management, e.g. centrally administered roles in Role Based Access Control (Sandhu 1996). They prioritise resource access control over the management of open communication and yield rigid organisational models that poorly reflect the fluid structures of value networks. To address this mismatch between management models and the reality of value chain structure we have developed the Community-Based Policy Management (CBPM), which enables declarative management policy rules to be administered within a flexible, group-based organisational model (Feeney 2004). This integrated the definition of resource access control and group membership policies with policy meta-management, i.e. defining policies for managing the delegation of authority for defining policy rules and for forming sub-groups or federated groups. We have integrated this support for explicit, devolved management decision-making into a content management system, resulting in a Community Management Framework (CMF) that, coupled with the visibility of online communication, provides an unprecedented platform for systematic empirical observation of management decision-making in web mediated value chains.

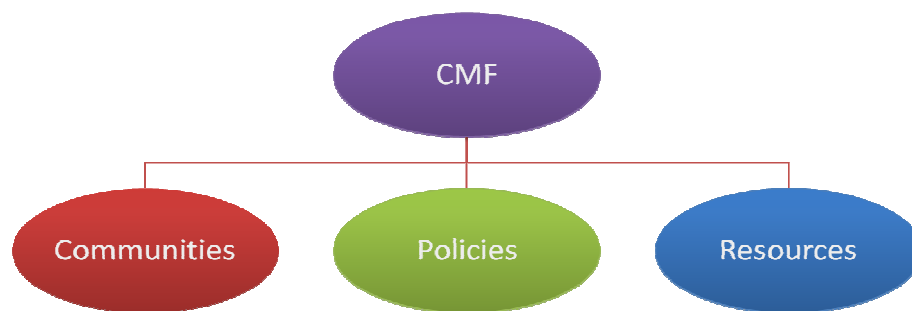


Figure 1: CMF – An integration management platform for communities, policies and resrouces

Opportunities and Challenges for Community Management

By providing a platform for powerful and visible self-management in online communities, opportunities for tangible benefits in many areas on lone activities can be envisaged. Here we discuss some of the more immediate possibilities.

Enterprise Applications: Although we focus in the first instance on how online communities as voluntary associations may evolve into value-creating organisations, enterprises and public bodies that aim to become more agile by decentralising decision-making may also benefit. Modern business management has seen a distinct shift towards more decentralised models that better suit knowledge-intensive and customer-focussed enterprises by devolving decision making, made by those closest to the customer, working in self-managing teams. Performance, operational and people management processes are designed to build trust, enthusiasm and commitment to the direction taken by the organisation. The major business benefit of decentralised decision-making is the increased agility of the organisation as it can react to increasingly rapid changes in its competitive, technology and regulatory environments. The CMF is well placed to address this need in the enterprise collaboration market. In contrast to systems that simply provide access control to Instant Messaging, IP-based desktop conferencing, message forums, blogs, wikis and other collaborative content-management systems, in a corporate setting, the CMF will manage communication channels to support the free flow of information and ideas while ensuring adherence to enterprise goals and constraints. For instance, certain information should clearly not be made available to suppliers or customers, while good governance, legislation and external regulation may require that certain parts of an organisation do not communicate about specific topics (e.g. the US Sarbanes-Oxley Act).

Corporate sponsored online communities: As well as using web communication internally, corporations are increasingly using online community platforms to interact with customers or innovation partners (Fuller 2006)(Cameron 2007). Some enterprises' entire business models are based on supporting such communities, e.g. online social network providers such as Bebo and Facebook. This, however, requires careful management to ensure the needs of the sponsoring organisation are balanced with the building of trust in the user community to ensure perceived value is maintained and anxieties about exploitation avoided (Shah 2006). The ability of the CMF to finely manage the degree of autonomy enjoyed by the user community will directly support such fine balancing.

Web-mediated Governance: By making management decision-making in online communities an explicit, observable activity on the web, this work serves to broaden the scope of the emerging field of Web Science (Berners-Lee 2006). It represents a practical extension to Web 2.0 technology that combines social network analysis for tracking the evolution of management issues in community discourse, with Semantic Web technology as a mean of capturing and evolving an organisational and resource management model. In this sense, the CMF takes the approach advocated by the Pragmatic Web movement, in that models are developed in response to the management needs and problems experienced by online organisations (Aakhus 2007). A concrete basis for this could be the promotion of the management model for web collaboration services developed in CMF trials as an interoperability standard to allow community management platforms to span many different services.

While the CMF certainly provides a technical basis for collaborative authoring of organisational rules, including those that dictate organisation structure further understanding is needed of how real online communities might use such technology. However, the accelerating technological change brought about by open innovation in Web-mediated communication and the sensitivity of online community behaviour to such change (Blanchard 2007) poses a threat to the durability and external validity of empirical management studies of organisational behaviour in online communities. Instead, consistent with the need to empower online communities to progressively self-manage, we aim for any deployment of the CMF to involve the community in continuously reflecting and reacting to the observations made. Informed by the goals of ethnomethodology (Garfinkel 1967), we seek to empower community members to operationally recognise requirements for, and the emergence of, group norms that can then be usefully encoded as declarative rules. So rather than trying to deploy the CMF in ethnographic studies, we aim to make it a tool inherently suited to reflective action research by its users and structured in a way that they are encouraged to report and share experiences made visible by the platform on how they developed successful organisational norms from their collaborations in different situations.

Community Based Policy Management

Current texts addressing the management of online communities, often referred to a *community governance*, are based on online ethnographic studies (Kim 2006) or practitioner experience (Preece 2000)(Fogel 2005). Though these provide advice on the importance of devolving authority to subgroups, this guidance is targeted at the central administrators that are required by the prevalent architectures used in conventional collaboration platform involved, e.g. email lists and version control platforms. In these architectures, management is enacted through access control rules that control the ability of users to read or write to various elements of a web collaboration platform. Most modern systems have now abandoned the use of access control lists of named users due to the management overhead involved. Instead, the predominant abstraction in access control is the role, derived from the notion of a job function (Sandhu 1996). While the role abstraction may represent a bottom-up approach to modelling the organisation, the modelling process in role based access control-derived models generally takes a decidedly top down approach. Permissions are assigned to roles by specialist security administrators and, although many delegation models have been proposed, they are normally concerned with temporary transfers of permissions, with all permanent changes to the system's state carried out by administrators.

Thus RBAC models are built from the top-down, using low-level abstractions. This contrasts strongly with how structures and policies in real-world organisations tend to be created. As they grow, organisations divide themselves into top-down abstractions – creating divisions, branches, teams and so on as they are required – and assign sub-goals to these organisational units. The actual rules governing the functions of the units is often defined through a bottom-up process whereby policies are added through progressive grounding as problematic situations are encountered and, as they evolve, authority and resources are frequently redistributed amongst the organisational units in a semi-permanent but never entirely static way.

The principal technological innovation that enables the CMF is Community Based Policy Management (CBPM), developed in reaction to these shortfalls in the role abstraction (Feeney 2005). This is a novel technology that has been developed by the applicant's research team to support the collective management of resources and organisational structure using declarative policy rules (Strassner 2005). Its design prioritises the needs of human policy authors in the broad sense rather than assuming its use will be restricted to trained administrators by supporting the concept of progressive grounding whereby human policy authors build an understanding of how policies impact their organisation through their ongoing interaction and modification of the policy-set (Barrett 2004). Its logical design, reflected in its modular service-oriented implementation, enables different policy engines to be used if required. Its native engine supports: deontic and temporal assertions to identify of modal policy conflicts (e.g. both positive and negative authorisation rules for the same subject and target)(Dunlop 2003); meta-policies to resolve model policy conflicts and known application specific conflicts and attribute mutability so context-adaptive rule can be defined (Zhang 2006).

CBPM differs from previous policy-based management approaches, however, in its unique and novel use of the group rather than roles as the fundamental structural abstraction. A group is a set of people engaged in a shared activity. By defining sub-groups and federated groups through explicit mandates for exercising decision-making authority, an organisation of self-managing groups can be formed around the evolving needs and experiences of an online community. These mandates can be progressively grounded as patterns of authority change or as new models of resources or context emerge and their impact on the distribution of authority is captured. Controlling the interconnection of different social and IT rules between groups restricts the portion of an organisation's current rule set that collaborating decision-makers must understand, thereby making collective decision-making more scaleable.

Clear providence of rule authoring authority ensures that the cause of application-specific conflicts when policies authored in one part of a community clash with policies or goals from another are immediately identified, thereby quickening their resolution. The explicit modelling of group structure and policy-rules and the resulting identification of policy conflicts and the parties necessarily involved in their resolution, provides the primary source of signals about management changes enacted by the community that will be used in this study.

We have used the Indymedia network, an online network for global news reporting that is independent of large news corporations (Morris 2003), as a previous action research case study of CBPM. The Oscailt Content Management System (www.indymedia.ie/oscailt/), which is the Indymedia community server, was

modified to enforce all access control decisions according to policy rules. Then the structure and organisation of the community was tracked over a year during which the CBPM proved able to accurately model the structural changes. This illustrated that CBPM possesses the power to manage changes in the distribution of authority and to resolve problems in organisational structure through detection and analysis of policy conflicts. The explicit, declarative nature of the policy rules and their structuring in a way that reflects the structure of community was shown, therefore, to support reflection upon that structure by its members.

CMF Implementation

In developing the CMF, we have shown how the CBPM system is suitable for managing a range of web communication channels, e.g. content posting, instant messaging, message for a, blogs, wikis, web feeds etc., by using it as a generic management plug-in for the Drupal collaborative portal platform. Ongoing community annotation of how these rules were captured and how effective they proved over time may result in reusable patterns of self-management that can be exchanged. The CMF therefore has been developed explicitly as a platform for participative action research, which will thus enable open innovation in explicitly modelled self-management strategies. Our aim now is to study self-management in online communities through longitudinal observation that will focus on the emergence and diffusion of publicly available self-management strategies across the Internet. In this way, we are forging a new interdisciplinary link between a participatory action research approach to studies of management behaviour applied to value networks, as found in studies of management information systems (Lau 1999), and the observation of emergent user behaviour in online communities, which is a key tool of Web Science (Berners-Lee 2006).

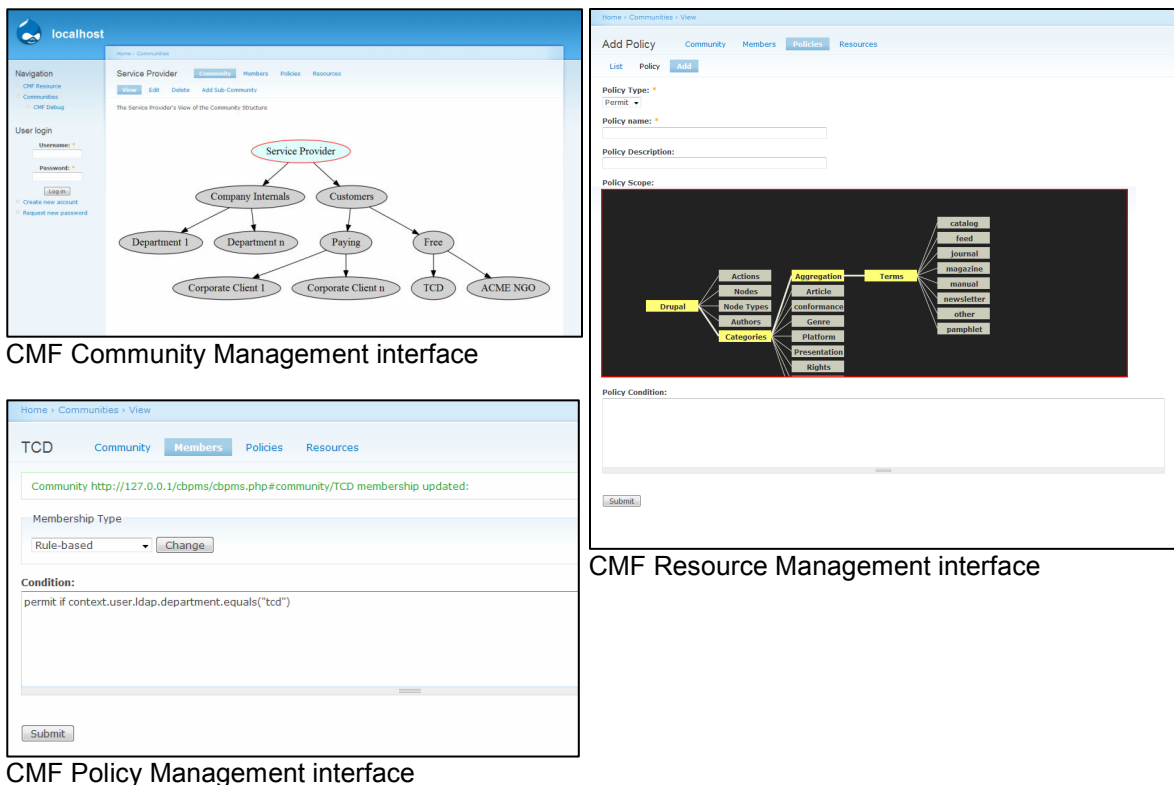


Figure 2: CMF Community management interface, policy-management interface and resource management interface

Conclusions and Future Work

Using this platform we are developing a systematic, iterative approach to collectively managing the devolution of decision-making in online communities. We are extending the CMF platform with a set of novel self-management support services: for progressively capturing community norms, operational rules and other organisational knowledge; for self-reporting operational problems; for reflecting on the impact of

management decisions and for exploring the potential impact of future decisions. We, therefore, are actively seeking partners in the Web Science and Internet Research communities who would be interested in using the capabilities of this platform offered as a web service. We especially seek links with those in complimentary fields such as sociology, group psychology, organisational theory and information science, but are open to approaches from all relevant fields as well as from potential trial communities.

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