



Collaborative Tools for e-Participation across Networks

The Comuno Networking Site for Public Governance and Services

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Abstract: *This paper presents collaborative tools for public participation across multiple networking sites. The tools are part of the Comuno networking site for public governance and services, which is particularly targeted at the public sector (currently in alpha testing at <http://comuno.org>). The Broadcast tool allows cross-posting content from Comuno to a wide variety of other networking sites, such as Facebook or Twitter. The UserFeed and TopicFeed tools build RSS feeds from content published by a specific user or under a specific topic. The LifeStream tool gathers a user's activities across multiple networking sites in the private account section at Comuno. These tools and related aspects of the Comuno networking site are discussed and presented in the context of deliberation and opinion-forming in a Swiss bilingual city.*

Keywords: Social Networks, e-Participation, Collaboration, Interoperability, Comuno

The Comuno project develops a networking site for public governance and services particularly targeted at the public sector. The Comuno networking site is currently under active development and recently entered the alpha testing phase open to the public (<http://comuno.org>). The objective of the site is promoting participation of citizens in public matters and collaboration between citizens and public officials. Public participation is a recommended approach for problem-solving characterized by complexity, i.e. multiple and equally legitimated views on a controversial and multilayered policy issue. In this context, e-participation refers to ICT-supported participation in processes involved in public policy (Wikipedia, 2009)⁰. This paper focuses on collaborative tools for facilitating public participation across multiple networking sites.

The paper is structured in four sections, including this introductory section. The next section outlines the framework that underpins the Comuno networking site. The content structure is based on metadata from controlled vocabularies making targeted content retrieval possible. The use of metadata is also an important condition for the faceted search functionality. In addition, built-in multilingual support allows accessing content in different languages based on the same content structure. Regarding cross-network collaboration, the *Broadcast* tool, the *UserFeed* and *TopicFeed* tools, and the *LifeStream* tool are presented. The third section discusses tools and features of the Comuno networking site in the context of a concrete use-case, deliberation and opinion-forming regarding bilingualism in the City of Biel/Bienne. The final section provides a conclusion and outlook concerning further development of collaborative tools for cross-network e-participation.

1. Framework: Content Structure and Collaborative Tools

The following section presents some key elements of the framework that underpins the Comuno networking site. In this paper, the focus is on two aspects of the framework: content structure and tools for cross-network collaboration. Regarding content structure, particularly important are metadata and vocabularies for organizing and retrieving content in public sector applications. Equally important is multilingual support if constituencies are characterized by multiple native language communities. Regarding collaboration, particular emphasis is given to collaborative tools

for public participation across multiple networking sites: the *Broadcast* tool for cross-posting to other networking sites, the *UserFeed* and *TopicFeed* tools for aggregating content and building RSS feeds, and the *LifeStream* tool for gathering activities across multiple networking sites.

1.1. Content Structure and Content Retrieval

The Comuno networking site provides topic-focused portal pages that aggregate content pertaining to the corresponding topic. In order to organize and retrieve content, metadata from controlled (i.e. predefined) vocabularies are assigned to content. The ability to assign metadata in a structured and consistent way is a key requirement (Bountouri, 2009; Green, 2009). When submitting content, users are therefore asked to select one or more terms from the controlled vocabularies. In addition, users may add and select own terms via the so-called folksonomy vocabulary for collaborative tagging. The use of vocabularies featuring multilingual metadata makes targeted content retrieval possible.

The Integrated Public Sector Vocabulary (IPSV) establishes an interoperable encoding scheme for tagging content with metadata targeted at the public sector (Cabinet Office E-Government Unit, 2006). The content structure, based on the IPSV, defines the user interface for primary navigation (primary menu). The light-weight hierarchical structure consists of no more than three levels thus allowing tagged content to be accessed quickly. For example, the top-level heading 'Business' has a section 'Business regulation' which in turn features subsections such as 'Regulation and deregulation'. However, tagging content with metadata from the IPSV is only a necessary condition for targeted content retrieving. In order to achieve the granularity needed to collaborate locally on a topic, geographic metadata are also needed.

The Geographic Locale Vocabulary (GLV) provides the interoperable encoding scheme for assigning geographic metadata to content (International Organisation on Standardization, 2006). The GLV uses a light-weight hierarchical structure consisting of global region, country and local region. Using the IPSV in conjunction with the GLV thus allows more precise content filtering. For example, if the local region is set to Berne (Switzerland), selecting 'Regulation and deregulation' from the primary menu exposes only relevant content assigned with that locale. Setting user preferences in combination with light-weight vocabularies thus provides high granularity in an international site with a generic content structure.

In addition to the primary menu, faceted search or faceted navigation allows accessing content from different perspectives or facets. The *FacetSearch* tool implements faceted search using the Apache Solr open source enterprise search server. The tool uses multiple metadata assigned to content that is retrieved after entering a search phrase. Relevant content in the result list can thus be filtered based on metadata from the IPSV, the GLV, the folksonomy vocabulary, and from generated metadata such as the publishing date. For example, the search phrase 'business policy' may yield content classified either as 'Regulation and deregulation' or as 'Consumer affairs'. By unmarking the latter term, the result list excludes content classified as 'Consumer affairs' thereby improving targeted content retrieval. Faceted search thus combines the strength of navigation by hierarchical structure with that of direct search (Association for Computing Machinery, 2006).

Finally, the Comuno networking site provides a range of features with built-in multilingual support. For example, all site-wide content, such as menu labels and metadata, are available in multiple languages. For clarity, the English terms of the vocabularies are used in this paper. However, the headings and sections of the primary menu are displayed in the chosen language. In addition, built-in multilingual support enables qualified users to add additional languages as needed. It also improves the maintenance of translations by individual content contributors. For example, a qualified user may add a translation of content in another supported language. The translated content automatically replaces the original content for users or visitors who prefer viewing content in that language.

Figure 1 exhibits the interface elements. Elements labeled "1" display the topics from the IPSV, for example, Public expenditure. Annotation makes content appear precisely under the

corresponding topic(s) independent of physical location (condition 2 mentioned above). The element labeled “2” displays the geographic terms from the GLV. Using the terms from the IPSV and GLV makes it possible to filter for topics relating to a specific geographic area. In addition, element labeled “3” displays the enabled languages. Selecting a language retrieves only content in that language pertaining to a topic and/or a locale. For example, topic-specific content related to the United Kingdom could be filtered to display only the Welsh language, if enabled. Finally, element labeled “4” displays all user-generated terms (tags) assigned to content. These four interface elements enable targeted content retrieval precisely to the desired area that is sought. In addition, embedded SIOC elements, such as content type or author, enable even more precise content filtering. Most importantly, this level of precision covers not only onsite content but all online content, once common semantics (e.g. IPSV) and standards (e.g. SIOC) are incorporated across the Internet.

The screenshot shows the Comuno website interface. At the top left is the Comuno logo with the tagline "connecting worlds". Below the logo is a language selection menu with "3 English" selected, and options for "Français" and "Deutsch". To the right of the language menu is a breadcrumb trail: "Home → Economy → Public finance → Public expenditure". The main article title is "Economists reject calls for budget cuts" by Jean Eaglesham and Daniel Pimlott. The article text discusses economists backing Alistair Darling's decision to delay spending cuts. Below the article text are three highlighted elements: "1 Public expenditure", "2 United Kingdom", and "4 Tags". A "Comments" section follows, with a comment titled "Income tax revenue was down" by "A workers' comment" dated February 19 11:42. The comment text discusses income tax revenue and public spending. A login/register prompt is visible below the comment.

Figure 1: Interface elements displaying common semantics and languages

1.2. Collaborative Tools for Cross-Network Interaction

The Comuno networking site provides a broad range of collaborative tools available to its users. However, other networking sites exist that are not targeted at the public sector but attract a wide range of users. The ability to interact with users at other popular networking sites is therefore a key

requirement. Since describing all of the site's collaboration features and activities is out of the scope of this paper, the focus is on tools aimed at collaborating across multiple networking sites.

The *Broadcast* tool allows sharing content from the Comuno networking site with other networking sites. Users who have the corresponding accounts with other services can choose to publish to these services whenever they submit new content. Multilingual users can set up multiple accounts at the external service with each account featuring a different language. When submitting content, users can select to which of their accounts to publish. For example, while publishing content at the Comuno networking site, a user with Facebook and Twitter accounts can also submit content or content descriptions to these two services. The transactions are controlled via the application programming interface (API) of the external service.

The *UserFeed* and *TopicFeed* tools build RSS feeds (Really Simple Syndication) aggregated either by author (user) or by topic, respectively. A feed refers to a file containing aggregated content that is accessible via a URL and displayed by news reader programs or by other websites. Multilingual support can also be enabled for RSS feeds. Different feeds can be set up aggregating relevant content per language. For example, whenever a user publishes new content under a topic, the content features metadata about the author, the topic, and the language. The *UserFeed* tool aggregates content based on metadata about the author while the *TopicFeed* tool aggregates content based on metadata about the topic. This allows visitors to subscribe to content or content descriptions of a specific user or topic without visiting the Comuno networking site.

The *LifeStream* tool aggregates a user's activity across multiple networking sites on the internet and displays an overview within the private account section at Comuno. Users who have the corresponding accounts with other services can thus monitor their activities across multiple networking sites. For example, descriptions of posts at Blogger, Facebook and Twitter are aggregated and ordered along the publishing date or service and accessible through the private account section. The transactions are controlled by the API of the external service.

1.3. Summary

This section presented some key elements of the framework that underpins the Comuno networking site: content structure and cross-network collaboration. Concerning content structure, the primary menu (based on the IPSV) provides a convenient entry point to access content. In combination with the Geographic Locale Vocabulary (GLV) and user-defined locale preferences, the primary menu provides some granularity when accessing content on an international site with a generic content structure. However, the *FacetSearch* tool provides a higher level of granularity when used in combination with other metadata, such as from the folksonomy vocabulary. In addition, built-in multilingual support allows accessing content in different languages based on the same content structure to quickly add translations of existing content.

Concerning collaboration, the focus was on tools aimed at extending collaboration towards involvement of a wide range of relevant stakeholders, including lay citizens. The *Broadcast* tool publishes Comuno content on other networking sites with the purpose of connecting with and learning from related groups. The *TopicFeed* and *UserFeed* tools provide RSS feeds of content related to a topic or a user, respectively, with the purpose of keeping sporadic Comuno visitors up to date. Stakeholders using these tools are interested in policy deliberation or policy issues, either as active contributors or as interested citizens. The *LifeStream* tool aggregates a user's activities across networking sites with the purpose of monitoring one person's activities across multiple networking sites.

Table 1 summarizes key aspects of the discussed tools in the context of political involvement and e-participation. The table presents a short description of the tools, the scope of integration with other tools or services, the authors (users) who create and update information, the target audience, and the overall purpose of the tool. Taken together, these tools are beginning to provide a collaborative space that bridges the insular worlds of most networking sites.

Table 1: Comuno tools for collaborating across networking sites

Tool name	Description	Integration with	Authors	Target audience	Purpose
<i>FacetSearch</i>	Provides faceted search/browsing of Comuno content	Comuno metadata and navigation	Discussants of political issues	Comuno users engaging in political activities	Improving targeted content retrieval
<i>Broadcast</i>	Publishes Comuno content at other networking sites	Major networking sites (e.g. Twitter, Facebook)	Discussants of political issues	Citizens interested in political issues or activities	Connecting with and learning from related groups
<i>TopicFeed & UserFeed</i>	Provides RSS feeds of content by topic or author	News reader programs and other websites	Discussants of political issues	Citizens interested in political issues or activities	Keeping sporadic Comuno visitors up to date
<i>LifeStream</i>	Aggregates own activities across networking sites	Major networking sites (e.g. Twitter, Facebook)	Discussants of political issues	Authors who contribute across networking sites	Monitoring own activities across networking sites

2. Example case: Bilingualism in the City of Biel/Bienne

The example case discusses and presents the Comuno tools in the context of deliberation and opinion-forming regarding bilingualism in the City of Biel/Bienne. The bilingual city of Biel/Bienne in the canton of Berne (Switzerland) was selected as example case based on initial interviews on e-participation and the requirement for multilingual support of the platform. The topic of bilingualism provides a fertile background for discussing the Comuno tools in the context of internet-enabled deliberation.

Bilingualism in the City of Biel/Bienne dates back to late medieval times. Today, the native language of most inhabitants is German (55 percent), followed by French with 28 percent (Bundesamt für Statistik, 2000). While both languages are official languages of the city, policy-makers face challenges sustaining an equitable community as well as preserving the city's special role in the canton of Berne. For example, primarily French-speaking youths were found to experience educational disadvantages vis-à-vis their primarily German-speaking counterparts (Racine, 2000). Further research investigates the everyday communication and interaction patterns between the two communities in the city (Werlen, 2001). In addition, city officials emphasize the constitutional mandate of bilingualism in negotiations with regional and national governments (Gemeinderat, 2002). Addressing these challenges involves a continuous process of public deliberation and opinion-forming that is well-suited for e-participation.

2.1. Accessing Content

The Comuno networking site provides several entry points regarding the subject of bilingualism in the City of Biel/Bienne. First, selecting a topic from the primary menu leads the user to a portal page that aggregates and filters corresponding content based on the metadata assigned from the IPSV and the GLV. Because promoting the recognition of the two major languages may improve community life, one perspective on the subject may therefore be 'Community empowerment' under the heading 'Commune'. Another perspective on the subject may be 'Inclusive education' under the heading 'Education'. In both cases, with location preferences defined, the resulting portal page would only show location-specific content. For example, with the local region set to Berne (where the city is located), selecting 'Community empowerment' would present only relevant content from this region.¹

¹ Note that headings and sections of the primary menu (such as 'Community empowerment') are displayed in the chosen language.

Another entry point is through the *FacetSearch* tool. Faceted search is the preferred method if the content structure (i.e. the IPSV) is largely unknown to the user. Searching for the term 'bilingualism' from the folksonomy vocabulary quickly exposes all content featuring the word stem or root. Next to the result list is a small user interface featuring the mentioned terms from the IPSV, the GLV, the folksonomy vocabulary, and other metadata such as publishing date. Marking or unmarking terms allows filtering results based on vocabularies and other metadata. If the terms 'bilinguisme' or 'Zweisprachigkeit' were assigned to content via the folksonomy vocabulary, search results can be narrowed down even further. For example, a user may decide to confine the results to content tagged with either 'Community empowerment' or 'Inclusive education' from the IPSV and with 'Berne' from the GLV and with 'bilinguisme' from the folksonomy vocabulary. These parameters are stored in a URL, which leads the user to a portal page presenting content correspondingly.

2.2. Collaborating across Networks

Collaboration is integral to deliberation and opinion-forming but is often confined to a small number of active contributors. The use-case therefore focuses on collaboration tools aimed at integrating with other popular networking sites. The rationale is that political activity by a small but qualified group may be legitimate as long as the wider public is able to track and partake in political activities. With increasing internet affinity, a wide variety of constituents can be addressed via online channels. Three Comuno tools are primarily aimed at collaborating across networking sites and are discussed in the context of the use-case.

First, when submitting content at Comuno on bilingualism in Biel/Bienne, the *Broadcast* tool enables publishing that content to a wide variety of networking sites. Maintaining profiles at popular networking sites enables connecting with supporters and learning from members of related groups. For example, large Facebook groups in Canada and in Belgium already focus on the problems and opportunities of bilingualism (Rioux, 2009; Walker, 2009). At the same time, Facebook groups have formed aimed at promoting communal life in the city of Biel/Bienne (Rotstein, 2009; Velija, 2009). When submitting content at Comuno, users can publish directly to Facebook, Twitter, and many other services. In addition, Comuno users who maintain two Facebook accounts, one in German and one in French, are able to publish their German and their French content to the corresponding Facebook accounts.

Second, the *TopicFeed* tool allows qualified users to aggregate and publish RSS feeds with descriptions of content, assigned with metadata that concerns the issue of bilingualism in the city of Biel/Bienne. For example, a qualified user may publish a feed of French content tagged with the French equivalents of 'Community empowerment' and 'Inclusive education' from the IPSV and with 'Berne' from the GLV and with 'bilinguisme' from the folksonomy vocabulary. The combination of metadata makes it possible to build RSS feeds that are specific to the interests of the target audience. In addition, the *UserFeed* tool is suited for users who want to keep interested citizens informed about content they publish concerning bilingualism. To do so, a user may publish a feed of content tagged with his or her user name in addition to the metadata as in the previous example. The target audience typically subscribes to the feed using news reader programs, such as e-mail clients. By clicking on the title of a feed item, subscribers can access the full content at the Comuno networking site.

Third, the *LifeStream* tool allows Comuno users to track their activities across a wide variety of services to which they contribute. Short content descriptions of posts from these other networking sites are aggregated and ordered in the user's private account section. The tool is particularly suited to monitor past activities and identify the scope for further action.

2.3. Summary

This section discussed tools and features of the Comuno networking site in the context of deliberation and opinion-forming regarding bilingualism in the City of Biel/Bienne. It was shown that

accessing content via the primary menu and with user-defined locale preferences is suitable for gaining an overview of available topics concerning the use-case. However, in order to collaborate on a local topic, content retrieval should be more targeted and precise, both in terms of topic and of locale. The *FacetSearch* tool was shown to provide a high level of granularity, because using terms from the folksonomy vocabulary makes almost any level of detail possible.

Concerning collaboration, the focus was on tools aimed at extending collaboration towards involvement of a wide range of relevant stakeholders, including lay citizens. The *Broadcast* tool publishes Comuno content at other networking sites, with the purpose of communicating and learning from related groups. The *TopicFeed* and *UserFeed* tools provide RSS feeds of content related to a topic or a user, respectively, with the purpose of keeping sporadic Comuno visitors up to date. Stakeholders using these tools are interested in the state or future of bilingualism in Biel/Bienne. Using the *LifeStream* tool, a user can aggregate his or her activities across multiple networking sites, with the purpose of monitoring previous activities and identifying further action. In sum, these tools are beginning to provide a collaborative space that bridges the insular worlds of most networking sites.

3. Conclusion and Outlook

This paper introduced the collaborative tools at Comuno aimed at facilitating e-participation across multiple networking sites. The paper also focused on structuring and retrieving content, which was seen as precondition for interacting across networking sites. A common language and understanding of concepts and objects involved in public governance and services is also the prerequisite for semantically optimized public service delivery over the internet. Based on controlled and folksonomy vocabularies, communities of interest can be organized, as the use-case concerning bilingualism in the city of Biel/Bienne exemplified.

Aggregating relevant information is enhanced through dynamic semantic linking able to automatically consolidate diverse and heterogeneous sources related to a policy issue. Governments throughout the world have embarked on extensive campaigns to increase the number of online interactions with citizens and to provide large amounts of data and information over the internet (Wagner, 2006). Taken together and within the consistent content structure of the Comuno networking site, the *FacetSearch*, the *Broadcast*, the *LifeStream*, and the *TopicFeed* and *UserFeed* tools demonstrate the potential of integrating online activities across multiple networking sites. These tools are only a first and rudimentary step aimed at creating a collaborative public space that bridges the insular worlds of today's networking sites on the internet.

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