

Co-Evolution of Broadcast, Customized and Community-Created Media

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The roles of broadcast media and telecommunication media are being redefined as the diffusion of new forms of interactive media progresses. The broadcasting model has clear advantages in rapidly and ubiquitously spreading information and other content to large audiences, and in quickly building brand recognition. However, this synchronous media consumption model is challenged by new technology that promotes more fragmented and asynchronous media usage patterns. For example, digital television receivers and personal video recorders, such as *TiVo* or *Replay*, allow flexible local caching and customization of digital media content.

Simultaneously, people are gradually taking more active roles in seeking digital information and entertainment, participating in shared virtual environments, and becoming producers of media content. New forms of customized media and group communication enabled by the Internet are fundamentally different compared with traditional mass media communications.

There are signs signaling the emergence of more demanding and technologically empowered citizens and media customers. They demand new kinds of media content and services, but the role of traditional media in this process is largely to be defined. Therefore, the media companies are struggling to understand:

- how to better manage and deliver media content,
- how to provide better content and services for individual citizens,
- how active groups and communities operate in the digital context,
- how media professionals could support community activity, and
- how the media industry could benefit from this activity.

This chapter discusses three applications of media and communications technology and their impact on public service broadcasting: 1) *dynamic content customization*, 2) *community-oriented publishing*, and 3) *community content networks*. The discussion is illustrated with example projects in which the author has participated at the Massachusetts Institute of Technology [MIT].

Communities and social commodities

On the World Wide Web, active, participating and creative individuals and communities have created a wealth of media content of wide variety in type and quality. Personal home pages, web logs and community sites reflect the interests and characteristics of individuals and collaborative groups. At the same time, the scope of the peer-to-peer content sharing is demonstrated by hundreds of millions of files forming a massively distributed database of petabytes of data. Unlike the centralized distribution model, with Internet-based media servers providing simultaneous streaming of content to large audiences, the peer-to-peer model scales well to millions of participants.

The flexibility of networked hypermedia characteristic of the Web combined with these vast content repositories of peer-to-peer indicates great potential for interactivity and customization. With widely used Internet-centered applications, the computer is not just a task-oriented utility tool but also a communication tool suited to a wide variety of needs. As Winograd (1996) writes:

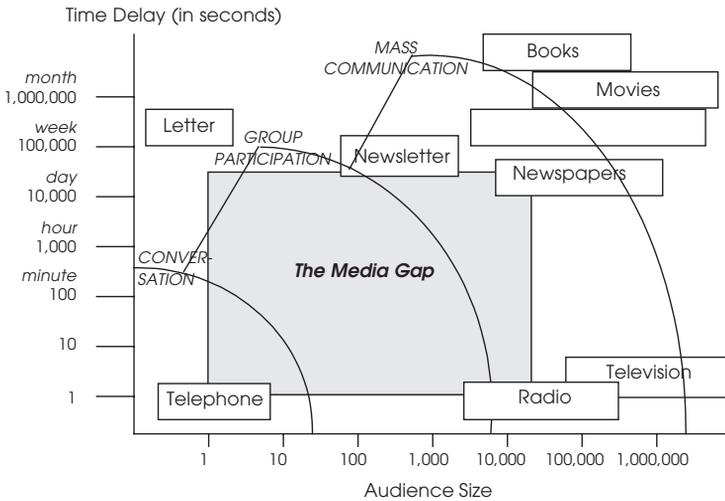
The computer (with its attendant peripherals and networks) is a machine for communicating all kinds of information in all kinds of media, with layers of structuring and interaction that could not be provided by traditional print, graphic, or broadcast media.

Thus, information isn't only data – it is also a social commodity that flows among individuals, and between communities at different levels of scale. Computer-mediated networking can reinforce existing physical communities, and help build entirely new communities (Bender et al., 1996; Castells, 2001; Fischer, 1998; Schuler 1996).

Mind the gap

In 1980, Tetsuro Tomita of Japan's Ministry of Posts and Telecommunication proposed the diagram depicted in Figure 1 (Tomita, 1980). The horizontal axis organizes media according to the size of the audience while the vertical dimension shows the delay in seconds between the event in real life and its appearance as a media product. Most media products have been geared towards large audiences, the only exception being small circulation printed newsletters and periodicals, which typically are either non-profit ventures or very targeted business or scientific publications. *The Media Gap* identifies an area in which the needs of relatively fast-paced group communications are not met by traditional media. Tomita claimed that computer-mediated electronic communications ultimately fills this gap.

Figure 1. The Media Gap, adapted from Neuman, 1991



Different forms of electronic group participation – discussion boards, newsgroups, mailing lists, chats, blogs, web sites – exist for professions, hobbies and interests of all sorts. Most of these forums are open to public around the globe. This phenomenon challenges professional journalists to find new ways to build relationships between media producers and active communities.

It is common for media organizations to embrace group participation by providing ‘community billboards’ or ‘community sections’ on their sites. However, the potential for co-beneficial relationship between professional media content producers and active community publishers has not been fully realized. Different modes of group participation are often considered by the traditional media as something to be tamed and moderated. The motivation for increased control is mostly due to the issues regarding immaterial rights and potential liability for community-created content.

Customized media content

Digital media allow for unprecedented flexibility in media content creation, access, interactivity and customization. Internet-based customized media content can serve the special needs of individuals, as well as small, and often geographically dispersed, communities.

With the Web, the amount of available information content is growing extremely rapidly. Online media content can be expanded with background

information and explanation, and search tools make vast quantities of related information instantly available to information explorers. As expansive content becomes easily accessible through a hyperlink or search engine, the volume of information can become overwhelming. In this world of abundant easily accessible information, the need for orientation and guidance becomes more apparent. Customized forms of information selection and presentation increase the perceived relevance of media content, and provide new and potentially more efficient tools for learning and creation of new knowledge.

Traditional mass media channels have not been amenable to efficient customization. At best, these media have only been able to tailor content to reflect perspectives of a local community within the parameters used in market segmentation strategies. Internet-based technologies for content management and personalization introduce a new set of tools for serving individuals and communities of much wider variation in sizes and types. For example, news content can be customized by filtering a subset of available news stories for the reader, or by augmenting selected news stories with personally relevant related material or illustrative comparisons as stipulated by the user.

Media customization can be approached from following three viewpoints (Turpeinen, 2000a):

1. *what is customized?*

- *content* can be selected, grouped, and organized,
- *presentation* can be tailored to suit the needs and preferences of the individual, and
- *delivery methods* can be tailored by media platform capabilities, update time and frequency, and cost.

2. *for whom is the customization done?*

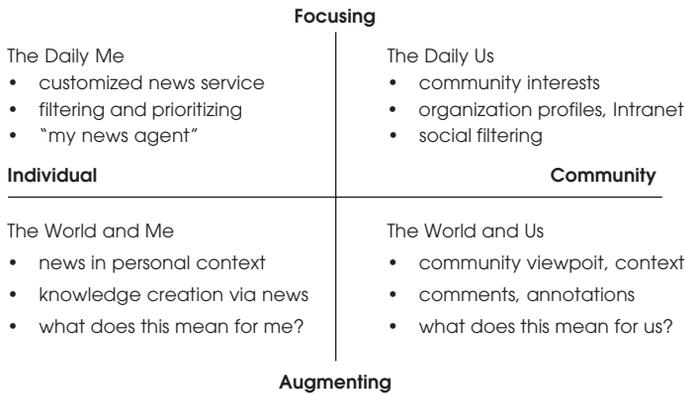
- *individual*: content or service is personalized according to a user model (or a user profile), and
- *community*: content or service is customized for a group based on a community model (or a community profile).

3. *how is media content customized?*

- *focusing*: selecting or prioritizing the media content to best match the user's interests and needs; the goal is to minimize media customer's information overflow, and
- *augmenting*: contextualizing content and services in a tailored manner to best fit the material to the media customer's previous history, experience and current situation.

This categorization is further illustrated in Figure 2 using news content as an example. Information focusing includes filtering and prioritizing of news items. This kind of service is often portrayed as a 'personal news agent' that brings most relevant news items to the individual's attention. However, one of the possible negative implications of personal content filtering is the loss

Figure 2. Customizing news content (Turpeinen, 2000a)



of a shared experience among community members. Without a common base of reference, news items are not shared, debated, and discussed like the common headline news of traditional media.

Malone et. al. (1987) argued that although users are often viewed as independent entities, they usually operate in a social context and are likely to share a significant portion of their interests with other users. Community-oriented customized news service can serve the specific interests of a group. Corporate Intranet news with filtered information on topics of interest is an example of a focusing service for communities.

Information augmentation is specifically designed to enhance understanding of content. With news stories, augmenting means adding explanations to existing articles, so augmentation is a way to provide context and background to news events. Augmenting complements focusing as the reader receives personally contextualized news. Customized augmentation increases the relevance of news by showing connections and comparisons keyed to a reader's history and current knowledge. Community-based news augmentation means contextualizing news stories with additional community-specific information.

Customization is always based on some model of an individual or a community. The customization can be directly controlled by the user, or it can be based on observations of users' behavior. A user model is a computer-accessible presentation of information about an individual regarding specified domains of use. This user model can consist of some or all of the following:

- data explicitly given by the user for the purposes of modeling,
- implicit observations of users' behavior, and
- inferred data about the user (for example, assumed market segment the user belongs to).

Privacy is one of the main social and technical challenges underlying any system that customizes media content for individual users. Typically, media companies and service providers provide explicitly stated privacy guidelines for the use of personal information. However, this requires a high level of trust from the user. The privacy issues in personalization are also dependent on the physical storage location of personal information. For example, in the case of TiVo, the profile used for customization is stored locally on the user's device. Also, there are technical mechanisms for providing pseudonymous service in which the user has persistent and verified digital identity and profile, but the actual identity of the individual is not known (Brands, 2000).

Community modeling

Community modeling can be used to model the collective group. Community is not static – new members can arrive and existing members can leave at any time, but there is a sense of belonging to a group of individuals, and the group is relatively stable (Lave & Wenger, 1991; Wenger, 1998). Instead of communities defined solely by geographic region or by joint interest, the web-enabled communities are often *communities of practice* that engage in a joint enterprise via mutual engagement (Wenger, 1998). Most communities engage in some degree of collective cognition – the interactions through which they learn from one another's experiences, set common strategies, develop a shared vocabulary, evolve common norms and means, and evolve a distinctive and shared way of thinking (Agre, 1998).

The term 'community' is often considered very positively, almost idealistically, as a situation in which people coexist peacefully and mutually support each other (Wenger, 1998). However, there are typically disagreements, tensions, and conflicts among the members. This is important when considering community-oriented or –focused services. Differing goals often cause conflicts inside the community, but conflict may sometimes be as important as cooperation in obtaining issue resolutions. Joint goals of the community can also be harmful to the larger community and to the society (Csikszentmihalyi & Rochberg-Halton, 1981; Wenger, 1998). Community can also be seen as a limitation as it often becomes inward-oriented and even hostile to other groups.

Community modeling has some significant advantages over individual user modeling: the contents of the model are negotiated in a social setting and are more likely to remain more static over time (Elo, 1995; Milosavljevic, 1997).

Active community publishers

Active individuals and communities use computer-mediated networking to tell and exchange their stories and to enhance the interaction among the

members and their peers in other groups. Community publishing is about 'grassroots activity' by groups that produce narrative content. In contrast to chatting, bulletin board discussion, or role-play, community publishing is therefore a constructionist activity specifically aimed at storytelling and sharing experiences in a community setting, as well as learning and using new skills regarding publishing.

The *Silver Stringers* project, initiated in 1996 by the MIT Media Lab, is an attempt to understand how electronic tools can enhance community life, especially among the elderly. Senior citizens have a vast store of memories, an understanding of the community dynamics, and a deep-rooted connection to the places where they have lived and worked. The Silver Stringers project taps into those attributes in developing new paths for community journalism.

The 'original' Silver Stringers are based at the Milano Senior Center in Melrose, Massachusetts. This group of 30 senior citizens has published *The Melrose Mirror* (<http://silverstringer.media.mit.edu>) on the Web since August 1996. The enabling tools and infrastructure have provided the Silver Stringers a new channel for telling their stories. In the past five years, their online publication has grown into a collection of more than 1000 stories produced by the group members.

The Junior Journal (<http://journal.jrsummit.net>) is a Web site published by a group of children and teenagers that emerged from the Junior Summit event held at the MIT Media Lab in November 1998. The majority of stories in the Junior Journal are on topics related to ideology, explorations of their own and other cultures, and ideas and projects directed toward changing the world.

Some of results and lessons learned in these two projects were that (Turpeinen, 2000b):

- *All communities are different:* Communities are like individuals; they have unique personalities. The contents and the style of publication reflect a community's identity, interests, geography, history, and demographics. Community publishing practices also vary widely across groups.
- *Support multiple roles and subgroups inside the community:* Over time, members specialize differently: some specialize in tools and technology, some act as bridge builders between communities, some like to stay on the periphery of the activity, and some typically emerge as leaders taking more responsibility for the summative activity. It is important to be prepared to accommodate all these emerging roles.
- *Provide strong sense of ownership:* It should be clear to the community members that they own the publication. The community members should be in control and make the decisions
- *Emphasize thinking before publishing:* Storytelling and community-journalism should be seen as *a tool to think with* in a group setting.

The enabling tools should help support and encourage collaborative editing, commenting, and peer-review.

- *Tools should be flexible and expandable:* Because there is no ‘one size that fits all’ community, the members should be able to figure out their own publishing processes over time. The tools must be flexible enough to accommodate the specific needs of each community in terms of self-organizing the flow of work and assigning the tasks and responsibilities among its members.

The *Silver Stringers* and *Junior Journalist* projects thus demonstrate how electronic community publishing can result in a meaningful and entertaining addition to traditional publishing. The community publishers have members with stories to tell, and they like to gain new skills in telling those stories. Active, participating and creative individuals and communities are using this opportunity to explore shared history through narrative, photography, audio, video, and other forms of artistic expression.

One of the issues with voluntary online communities of interest is that often their members do not make a lasting commitment to the community. This is mostly due to the lack of mutual obligation because these communities emphasize personal interests and it is often easy to choose to exit the community as a response to discontent and dissatisfaction (Galston, 1999). So in the case of active community publishers, common goals, mutual obligation, and shared responsibility are significant determinants of community success (Turpeinen, 2000b).

Community connections

The growth of active content producing communities has led to the need for new and different tools to facilitate interaction between communities. Community publishers devote their time and energy to producing potentially valuable (to others) content on the Internet. The problem is that electronic publications often remain isolated pockets of content because the existing tools for indexing, searching, and integrating Web content are not geared to inter-linking community activities. Thus, new tools and services are needed to build bridges across community boundaries by comparing the works of various community publishers and by introducing members of different communities to each other.

‘Recommendation systems’ using ‘collaborative information filtering’ techniques categorize users automatically into ‘neighborhoods’ based on similarities between user profiles. The tools use these neighborhoods to recommend new items to similar users, or to recommend users to each other (Shardanand and Maes, 1995; Resnick and Varian, 1999). A similar approach is used in a system called the *SilverWire*, which is a community-based ‘grass-

roots' newswire system that is simultaneously a resource and tool for inter-connecting community publishers on the Web (Turpeinen, 2000b). Instead of a recommendation system based on the individual characteristics of the community members, this alternative system clusters the participating communities according to similarity of created stories and uses this clustering as a basis for recommendations.

Although communities have been profiled from several perspectives – for example a psychological sense of a community (Chavis et al., 1986) or the socio-economic profiles of local communities – there is not much literature on methods regarding community modeling from the point of view of their joint practice. Community modeling in the SilverWire context entails defining a way of describing a community involved in a publishing activity. This should be done in a manner that allows comparisons between communities. Three main dimensions that characterize the community publishers and its activity are *purpose*, *community identity*, and *communication* (Turpeinen, 2000b).

The purpose of using community modeling in the SilverWire is to go beyond the standard 'crawl, index and search' approach in finding relevant material on the Web. This is achieved by augmenting the community-created content with community profiles and showing comparisons between community profile data.

Specially designed tools that collect and build community models can facilitate the process of building trusted relationships between communities. Barrett and Maglio (1999) use the term *intermediary* to describe a computational element that lies between an information producer and an information consumer on an information stream. Intermediaries can produce new information by injecting it into the stream, enhance the information that is flowing along the stream, and connect multiple streams. Conceptually, the *SilverWire* system is a Web intermediary that facilitates and augments the communication between community publishers.

Implications for journalism and broadcasting

New forms of media services are based on long-lasting relationships between media content providers and information- and entertainment-seeking customers. The Internet is driving towards a decentralized and community-oriented mode of publishing, and media organizations are thereby losing their traditional position as the sole gatekeeper of information.

Increasingly, the role of media companies in a networked society is to understand community needs, and then to act as a mediator between communities. The professional journalist may take the more traditional role as moderators of horizontal communication among audiences.

The media producer can facilitate this exchange by supporting the interchange of content and ideas. New tools for community communications can

also provide a way for conventional media companies to better serve community needs, for example by integrating professionally created information feeds with community publications.

The media companies that position themselves as community organizers are also bound to benefit from that role financially. There are viable market opportunities for advertising and electronic commerce for community organizers. These will act as connecting nodes providing loci of attention and recognition for various sorts of communities. Providing a voice in the electronic arena for community members also reinforces the brand of a media company. On the other hand, there can be new, still to be discovered, business models for media companies.

Traditional broadcasting companies should be prepared for more demanding customers, and to engage their audience with community-created content. The media companies have an advantage if they can creatively combine the skills of professional journalists with customized services in innovative ways that meet the special needs of individuals and small communities.

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