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Radio and the Internet: Networked Participative Radio Models

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Introduction

Radio is a network as well as the the Internet is. A network of technologies available online and also a network of users. It is interesting to study how radio will integrate itself into this network, to observe the transformations induced by the integration of the Internet network into its own network, and to study how the caracteristics of the Internet (horizontal structure, social network way of functionning, crowdsourcing) are incorporated, approprieted by internet radios or more generally radios diffused on the Internet and integrated into their structure.

The understanding of the caracteristics of digital culture, the incentives to create and to participate to social networks, the emergence of a networked economy of participation versus the market economy, resulting in a collective intelligence in which every connected single participant brings its part into a collective production, will provide us with a background to establish a list of behaviours in order to review a set of practices (use of social networks, crowdsourcing to produce and diffuse contents...) and patterns of radio structures and try to infer their future evolution.

The main question here is how the Internet is transforming radio but also how radio is using the Internet caracteristics to proceed with its evolution.

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As a result it is possible to say that adio structure integrates and uses the social networks in organisation. Radio becomes a huge network:

1) a diffusion network as it uses different kinds of platforms connected to the Internet to content such as cars, connected TV, computers, mobile phones, in a process of peer diffusion.

2) production network: these devices provide points of entry allowing interactivity and participation. Content can now be peer produced.

3) network of listeners in which listeners, through their participation to social networks, can share their radio listening experience with friends and thus provide a set of potential new listeners.

In a first stage we will review the surrounding context in which radiophonic activities and the Internet takes place. Then we will study how the Internet characteristics are integrated into listening habits, content production and diffusion and finally in the structures of radio organization.

1. First Part: The context

The context in which radiophonic activities take place is made of two components. The first one refers to the economic context of social production and the second part is a cultural context of convergence culture.

1.1. Economic context: participative network of information production

The context which must be taken into account is social production of information. This process is networked and participative. The production process uses three categories of inputs:

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- existing information: information is non-rival (its consumption by one does not exclude others from consuming it), it is both input and output of its own production process, and it comes from a mixture of non market sources and market actors depending or not from the copyright system.

- The technology to transform this information: the state of technology has lowered capital cost and enabled of the capital structure of production and distribution of information, facilitating its access to individuals. Concentrated business models of information production have started to shift towards non-markets organization relying on non-exclusive appropriation strategies.

- Human capacities: skills, creativity, experience

People produce and exchange information adding into the new output a part of themselves, their skills, their capacities, their own expertise. The Internet enables these decentralized units to be connected in order to share, transform, produce and distribute information.

The output is a collective project divided into small units performed by each participant. This characteristic is defined by Y. Benkler as the modularity of the project along with granularity (the size of the units)

Social production of information, according to Y. Benkler has two modalities.

- Independent non-market production processes in which people participate separately to a collective project. This case generates only a vertical connection. No cooperation is needed, everybody brings one's own contribution and then all these singular contributions need to be coordinated or aggregated.

- Dependent peer production processes in which people collaborate to a collective project generating a horizontal connection. These individual contributions are dependant as they build together the collective project.

We can use this distinction to classify internet radios. Structures where data aggregation or a search engine or a directory is needed pertain to the first group For example uploading a playlist or podcasts which can after then be selected by users according to their tastes or voting to choose a program.

Otherwise, we can model a collective radio, each participant contributing to the creation, choice and diffusion of the contents.

1.2. Incentives to participate

The state of technology enables people not only to be connected but also to share their spare time and skills. Technology enables now people to collaborate to collective projects.

As these projects take place, not within the boundaries of an organization or via the market mechanism, but in the context of social production, the question of the incentives appears. Why do people want to collaborate in a production system without any monetary reward? What kind of reward are they expecting? It is possible to infer that the Internet recreate the conditions under which exchanges of gifts took place in pre-market societies.

The gift theory literature can provide us with an answer. Gift, in ancient civilizations prior any market or monetary system, was the mean to create a link between disconnected social groups or individuals. Such a system can be described by the succession of three stages: give - receive - give back.

- To give in order to keep one's authority, to show one's wealth. The gift is the proof that this wealth is deserved.

- To accept in order to show one's equality.

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- To give back, and even more than received, in order to prove once again one's equality and thus to avoid becoming inferior.

Moreover, these stages are compulsory because the exchanged goods create a link between the person who gives and the person who receives. This link comes from the fact that the goods exchanged contain a part of the person who gives them. Beside this compulsory characteristic the incentives underlying participation to the exchange system are:

- Competition to establish a hierarchy. It is a competition for honor, authority, influence and wealth. Honor and wealth are bounded together. Not giving back after a gift offering means dishonor.

- Friendship to establish a link end ensure peace

- Recognition

- Social or political status

The motivations underlying the gift exchange system can be adapted for our purpose in the following way. When people or listeners or users choose to collaborate in sharing or producing content they put their time, technological resources and skills in the content shared or produced. These parts of themselves cumulate in a way that the received content which contains a part of "the donor" is the input whereas the output is the same content including the value added by "the donee". The content is then put in circulation and forms a collective project produced by a collective intelligence.

1.3. Cultural context: convergence culture

The process described so far is not only a technological change but also a cultural shift into a new protocol by which media are produced and consumed. A

protocol is defined by L. Gitelman (Benkler 2006, p. 15) as a "variety of social, economic and material relationship".

Technology gives the opportunity of a new behavior when it enables the means of communication to be available to almost anyone and to be decentralized. People have now access to new media technologies and have developed the skills to use them and take an active part of the knowledge culture they live in.

Convergence is a process by which:

- The same content can now be distributed across multiple platforms

- Platforms converge in the way they can distribute parts of the same content hence creating a global media experience offering different points of entry.

Convergence process can be described in two parts. The first one is the top down side of it. It explains why corporate radios (in the sense H. Jenkins (2006) defines corporate media) are present in the Internet, be it mobile or not, or in the social networks. With new media technologies, the same content can now be distributed across different platforms rather than a single one; it can also have different forms depending on the channel it is distributed; and according to H. Jenkins (2006; p. 11) new patterns of cross-media ownership make this kind of distribution desirable.

It is a corporate convergence: "extension, synergy, franchise" (H. Jenkins, p. 19). Where extension refers to market expansion by delivering contents through different platforms, synergy is the ability to control this process and franchise means coordination between different producers to brand and market contents under these conditions.

On the opposite side, the bottom-up side of the convergence process, users, thanks to lowered production and distribution cost, are empowered with a cheap and accessible technology and with all the necessary skills to use it. They can now choose

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the way they want to consume contents, they can choose the point of entry in this global media experience among the different platforms, they can pick contents where and when they want, then linking by themselves these contents in order to form a global media experience. But they have also the possibility to produce contents by appropriating the existing ones and reshaping them, adding their own value to them. It is a grassroots convergence. This explain why radio listeners are induced to collaborate with existing (or corporate) radios in choosing and producing contents, but also why they are induced to produce and diffuse content on their own (creating their own web radios for example) and finally to collaborate to a collective production and diffusion of content within the system of a collective radio structure.

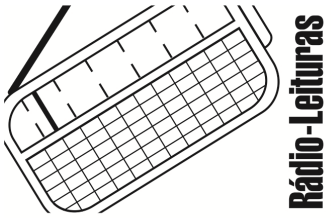
The result is in a double interaction. A first interaction (a vertical one) occurs between content producers and consumers. Consumers are encouraged to actively participate to content production or content choice through, for example crowdsourced radios.

A second horizontal interaction takes place between the former "only listeners" and also "new producer". Through a huge collaboration enabled now by the fact that they are socially networked, they can participate collectively to the production of contents and why not to a collective radio structure. The final result is an interaction between corporate and grassroots into a participatory culture.

Contents are spread among different delivery platforms and consumers make connections between these dispersed contents during the process of their global media experience creating in this way their own (personalized) consumed content (in the same way they build the produced content),

1.4. Collective intelligence

In these networks of listeners and content producer each individual participant takes part to a collective project behaving as a collective intelligence



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Collective intelligence is an expression defined by the cyber theorist Pierre Levy (P. Levy) to describe how individuals aggregate to form communities linked by a common interest and how they collaborate in a collective production process. According to his theory none of the participants owns the whole knowledge necessary to the collective project. Each one owns a part of it and it is only when these small parts are put together that they collaborate to the collective project. Individuals are the neurons of a collective brain.

The knowledge input owned by every single participant is collectively transformed into a new piece of knowledge output.

This process takes place in a world where technology enables people to be connected and to work together bringing technological and cultural convergence in a system where social production is efficient and desirable.

This process takes place in a specific anthropological space. P. Levy postulates four anthropological spaces: the earth, the territory, the space of goods and the space of knowledge. The third space provides the networks, connections and technological capacities for goods to flow, and then knowledge uses these infrastructures to be produced and to circulate freely. (P. Levy)

It is interesting to note that the incentives to the exchange of commodities that arise within the space of earth are still present and form the ground of participation into the social production and diffusion of knowledge, be it collective or not.

This is the base of our further analysis of the evolving and various forms of radio structures.

The advantage of knowledge inputs combined with digital technologies is that they become molecular as opposed to molar technologies or goods. That is, digital technologies can break knowledge inputs into units that can be easily reshaped and assembled to form a transformed new knowledge output. The same is true with

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organizations structures. In the classic system radio can be compared to indivisible molar structures due to capital cost. But thanks to decentralized and low cost digital technologies radio structures can be divided in molecular units which can be assembled in flexible ways.

2. Second Part: Consequences for radiophonic activities

The aim of this part is to see how internet radios combine classical radio features with the characteristics of a social networked economy with a convergence between grassroots and corporate side, between consumer and producer of content, and whose consumption and production process is driven by a collective intelligence.

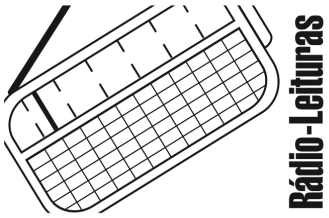
Three points are important: diffusion, listening and production because they lead to changes in the radio structure.

1° the Internet characteristics in diffusion or delivery

When it comes to diffusion the questions of "how" and “what" arise.

The first one refers to diffusion technologies and platforms. Clearly the challenge here implies ubiquity and mobility, two characteristics of broadcast radio that internet radio must possess.

The challenge for radio delivered through the Internet is to become as ubiquitous as broadcast radio is. This means delivery through all the devices that offer an internet connection. Because radio listeners are also Internet users and because radio listening is thus part of a global entertainment experience taking place on the Internet, it is important to follow and to stick to the listeners habits. There are a lot of ways to listen to Internet radio away from the computer nowadays.



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On the one hand internet radios are present on every device provided with an internet connection. The trend began with computers and laptop computers and expands now with tabletop radios that stream internet radios, wifi tabletop radios, internet radio receivers for home stereo systems. These device are multitasks in the sense that they offer applications to stream internet radio but also other services like connections to the social networks which change the individual listening habits for a collective way of sharing the radio experience. More recently internet radio can be listened to with connected television sets. But also on mobile devices like tablet computers running internet radio applications and ebooks devices.

All these devices offer multitasking possibilities and it is the reason why radio listening can benefits from being part of a global entertainment experience enabled by the fact it belongs to the Internet world.

Alongside ubiquity internet radio is becoming increasingly mobile. The catalyst for internet mobility is the smartphone phenomenon. Using applications internet radio can be streamed through smartphones. This trend is expected to strengthen as smartphone sales are growing and 4G technology is arriving. A subsequent advantage of smartphones is that they allow internet radio to be diffused in cars. In-car smartphone integration system delivers Internet content to the dashboard, including internet radio with the help of an appropriate application.

The answer just provided to the question “how” gives an insight into the second one, "what kind of content can be diffused?" We have different delivery systems but they offer other possibilities than simply being delivery systems. They can improve the listening experience by expanding the variety of content showing a real complementarity. The fact that radio listening is now embedded in the whole internet experience offers new possibilities as far as diversity of content is concerned. Content can now be differentiated according to the platform used for their diffusion, instead of having the same content delivered on every platform. It is the multiplicity and diversity

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of platforms that implies the diversity of content. In this way radio programs become molecular, they can be fragmented and each of these fragment will be created for a specific platform so that radio listening becomes a global entertainment experience in which every listener can choose his or her own point of entry. This characteristic bears a consequence leading to an improved personalization of listening habits.

We can thus say that radio webcasting involves ubiquity and mobility as broadcast radio is. Furthermore, appropriating the molecular characteristics of internet delivery has consequences on content delivery and its characteristics which have further consequences, first on the listening habits and then, on the way content are produced which in turn will have consequences on the structure of the radio organization.

2° The internet characteristics in listening habits

Listening appropriates two main characteristics of the Internet experience that seem at first sight opposed: personalization and collective listening.

Personalization is achieved in three ways: the listening time (when), the point of entry in the listening experience (how), the content (what).

- Personalization of the listening time

Personalization means firstly that listeners can choose when they want to listen to radio. This leads to time shifted listening habits through catch up listening. This is only allowed by technology and does not imply any action on content.

- Personalization of the point of entry

Personalization means choosing the point of entry in a global listening experience as we have just shown. Content are differentiated according to the platform that delivers them, the listener can choose his point of entry in this global

listening experience. Even if the program is the same for all, personalization occurs in this case because the multiple combinations of the different molecules create a unique global experience for each individual listener, providing freedom and flexibility.

These two characteristics imply here a personalization in the "use" of the radio content.

- Personalization in the choice of content.

Personalization also means that listeners can choose what they want to listen, they can exercise an influence on content selection. It is achieved primarily through personalized music streaming and personalized radio stations based on music genre.

A few examples are Pandora, Last.fm and its scrobling technology, Rhapsody or Spotify.

Rhapsody is an online subscription music service, launched in December 2001, and available in the United States. It is a streaming on-demand music subscription service and offer unlimited access to a large library of digital music.

Pandora Radio is an automated and collaborative music recommendation service based on the Music Genome Project. Users enter a song or an artist that they like, and the service responds by playing similar selections. Then the listener approves or disapproves the song proposed and this feedback is taken into account for future proposals and selections.

Selection is made by considering musical attributes like rhythm syncopation, key tonality, vocal harmonies, or instrumental proficiency.

Last.fm, a music website founded in the United Kingdom in 2002, can build a profile of users musical tastes. When the user listens to music, either from Internet radio stations, from his computer or portable music device, a music recommender system called "Audioscrobbler", records the songs listened to and transfers this

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information to Last.fm's database. The site is thus able to recommend music that matches the user tastes. It was also possible to create personalized radio stations but this service was suspended in November 2010.

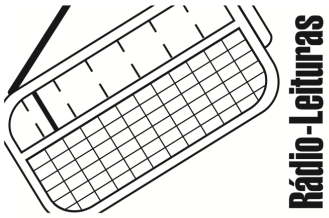
But customization can even be brought forward with content other than music.

- Radio.com launched by CBS Radio and CBS Interactive Music Group is an integrated streaming platform. It integrates Last.fm's "scrobbling" technology which keeps track of which music is listened to most, and then generates other music recommendations in order to create personalized radio channels based on that information. It thus ties together hundreds of online radio stations.

But it integrates also news feeds and blog content from hundreds of music, news and sports sources.

- BYO.fm - for "Bring Your Own - streams music already owned by listeners, and offers in addition a customizable selection of news, sports, weather reports, and a choice of voice announcers. This example is not only a customizable music streaming service but also a personalized online radio station.

Personalization is allowed by the fact that content are not molar anymore i.e. not global and indivisible content but molecular so that listeners can choose what they like the most and can be provided with content that match their tastes. But behind personalization lies also the fact that audience has also become molecular instead of being a global entity or a molar audience. The capacity for each individual listener to create a personalized listening experience illustrates this change. Furthermore the fact that the listening experience takes place in a networked context, like the Internet, raises another possibility. These molecular listeners with their capacity to personalize their listening experience through molecular content are now able to connect with one another in order to share this experience, hence forming a collective intelligence able to create a collective pattern of radio listening.



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Collective listening is achieved by linking listeners together. This connection is achieved either because the radio sites provide social networks features or because listeners are linked through social networks.

Last.fm's social networking features enable users with the possibility to build friend lists and to recommend music. Users with a common interest can also form groups. A group profile similar to the individual user's one is created. This collective profile shows the whole group's tastes and its members can submit recommendations to the other members. Moreover a radio station based on the group's profile can be generated when the number of members is sufficient.

In the same way, Spotify's users can share their playlist or create playlists in collaboration with other users and since April 2010 users are allowed to connect to their network on Facebook in order to share playlists.

Listeners can also share their favorite channels with direct links to Facebook and Twitter.

With the "Open Graph" software, Facebook expands its social-network functionality to nearly any online publisher like Pandora, or any webradio or station. When the software is added to a specific site, Facebook members can share with their Facebook network their interaction with the site. Thanks to the partnership between Facebook and Pandora, for example a Pandora listener, links his Facebook and Pandora's profiles and see what station his network is listening to. With this integration it becomes possible to create a collective station which gathers all the music the network likes.

The same is happening with music site “We Are Hunted” and its launch of a "real time radio" service, pulling data from what MySpace users are listening to.

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The interactive service Rdio integrates with the Twitter platform. When an Rdio member Tweets a song, the other Rdio subscribers and the other Twitter users can listen to the song.

The listening experience becomes collective thanks to the group of molecular listeners who create a collective intelligence through their social networks. This collective intelligence builds a collective listening by choosing and sharing the individual listening experience.

In addition to the classical vertical connection between the radio station and its listeners, a horizontal connection between individual listeners appears, complementary to the former one.

3° the Internet characteristics in content production

Production of radio content falls within the context described part one.

Firstly, the production technique has become molecular with cheap and easily accessible computers, opensource softwares and Internet connection. This fact allows a grassroots appropriation of the input information needed to produce content and its transformation into a new content.

Secondly this grassroots production takes place in a context of social networked economy as described by Y. Benkler driven by the motivation highlighted by the gift literature.

Finally the connected individuals operating within this networked economy form a collective intelligence directed to the production of a collective content. The model that best fits this context is crowdsourced radio. This concept however entails different modalities.

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The first one occurs when listeners vote to build the program. This instance of audience participation is not new but it can be implemented and developed with the possibilities offered by the interactivity of the Internet. Here, voting represents the act of production and the program resulting from this process is collectively produced through the vertical connection between the radio station and its listeners even if at this stage the horizontal connection between listeners is not operative.

Jelli is an example of both on demand and collectively produced programming by listeners. Listeners determine shows or musical programming by interacting online. They firstly request content and then they vote online.

Listener Driven Radio is a crowd-sourced service similar to Jelli. Listeners control a station's playlist by requesting songs and rating them online. These inputs are then used to change the programming. Moreover the partnership with Virgin Radio/Italy to launch its “Radio Comando” platform brings crowdsourced radio from internet to broadcast radio. Using the same system Virgin Radio listeners build the sound of Virgin Radio in real time.

The second one occurs when users upload content produced by them. In this case this bottom-up production is still individual.

For example KYouRadio, formerly San Francisco's 1550 KYCY, an AM station, converted its programming in 2005 to an all podcasts format. Listeners are invited to submit their podcats uploading them to the site radio website. After a selection process, podcasts are broadcasted on 1550 KYCY-AM and streamed on the Internet via the Internet website, www.kyouradio.com.

This example shows a situation where individuals use their production capacities, their connection and their skills to participate to a collective project.

The third stage occurs when users produce their own content for their own radio.

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In this case the vertical connection is replaced by a horizontal one linking individuals together in order to generate a collective intelligence participating to a collective project. The webradio is the collective project and it is also the expression of a collective networked and participative production process.

Everything is now molecular: the audience, the production technique, the project.

4° how these characteristics could reshape radio structures

The integration of these characteristics into content production content diffusion and listening habits can reshape the structures of radio organizations allowing, for example:

- the existence of collective radio

- discontinuity in time and in space

- horizontal structure vertical structure

- many to many instead of one to many logic of diffusion.

Collective in two ways. Firstly in the way people choose the content they want to listen, for instance by voting the music or via their connection through the social networks. Secondly in the way people can propose content like in crowdsourced radio or directly produce them in an individual or collective way.

The immediate consequence is that radio structure becomes horizontal instead of the classical vertical structure. It can now assume the shape of a horizontal network of connected content listeners/producers. Each of them, being a single part of a whole collective intelligence and working together to a whole project. It is now a many to many structure.

Moreover, this structure does not need to be permanent. As the technical means are dispersed and distributed among the participants to the project the continuity imposed for instance by a heavy initial capital investment is no longer valid. So, the project can be interrupted and restarted again later on according to the needs of the audience, the content producers or circumstances.

In the same way, each participant owning the technological means to collaborate to the project, the whole structure does not need to be centralized in a definite location anymore. This allows more flexibility, the structure size can be increased or reduced. This also allow ubiquity, the structure is potentially present everywhere depending on its participants location.

Conclusion

The participative networked of information production and the cultural convergence context in which radio webcasting takes place modify the modalities of content production and diffusion as well as changes in the listening habits of audiences. The radio network integrates now the characteristics and the behaviors prevailing in the Internet network. This phenomenon can creates organization structures that are different from the traditional vertical one. These structures are now horizontal, as we are in the presence of networks, networks of content producers and networks of listeners. They are decentralized and flexible and their shape is defined by the collective activity of their members.

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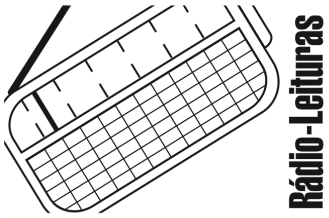

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Abstract

Radio is a network as wall as the Internet is. This paper studies study how radio will integrate itself into this network and to observe the transformations caused by the integration of the Internet network into its own network: Radio structures integrate and use social networks in their organisation, becoming a huge network: A diffusion network using different platforms connected to the Internet to diffuse content ; a production network: these platforms provide points of entry allowing interactivity and participation; a network of listeners in which participation to social networks helps sharing the radio listening experience with friends providing potential new listeners. Shiftting radio structures: An horizontal networked structure. A dynamic structure changing through time and space. Radio incorporates caracteristics allowed by digital technologies and the Internet: Instantaneous time, crowdsourcing, participation, personalisation.

Keywords: Radio, Internet, Technologies.