

Vorabfassung des Artikels

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Characteristics of the Classic Radio Experience Perceived by Young Listeners and Design Implications for Their Digital Transformation

Abstract. Radio is on its way to become a digital service. After the music industry, radio broadcasters also start to innovate their offerings – albeit with some delay. However, current digital nonlinear radio services might end up being a dull media library. Our aim is to start thinking about the design of digital nonlinear radio services with a focus on the traditional “radio listening experience” from a consumer value perspective and the transformation of its characteristics to a digital context. The contribution of this paper is twofold. First, we provide a catalogue of characteristics that make classic radio worth listen to – the radio listening experience. To achieve this, we conducted a qualitative study to collect characteristics associated with radio and grouped them into meaningful categories. Second, we identify implications for digital radio services based on the characteristics we elicited. We conclude with a discussion about the forward projection of the classic radio experience for digital transformation.

Keywords: digital transformation, radio broadcasting, digital radio service, service-dominant logic.

1 Introduction

Radio is on its way to become a digital service. While the traditional kitchen radio might still exist in fifty or hundred years, the consumption patterns evolving through the emergence of music streaming services like Spotify become imperative for future radio consumption as well, for example, non-linear playout with automatically generated playlists tailored to the interests of the user, ubiquitous access, and users giving feedback to the system.

Current efforts to transform radio to a digital service on, for instance, smartphones often fail to maintain the radio experience and end up being a low-appealing media library [1]. Heidmeier [1] defined a well-designed online radio as attentive entirely to consumers’ individual needs towards entertainment and therefore being nonlinear. Currently available offerings on the other side would be comprehensive but still just media libraries with poor ergonomics and a missing consideration of the listeners’ user story.

Thus, it seems that radio broadcasters lag behind when it comes to individualized media consumption. One important reason is that they did not have as much innovation pressure as the music or movie industry. While business models for the latter were in deep crisis after in the 2000s, radio broadcasters still had their traditional business model. But now the situation changes: As mobile music streaming becomes more popular, radio broadcasters realize that in the end they

compete for the same customers because people's time and attention are limited. A higher consumption of popular music streaming services by the younger generation might therefore lead to less or no consumption of radio at all.

Next to delayed innovation pressure, it is more difficult for broadcasters to digitalize their service than it is for music streaming services because transforming a traditional radio station to a digital service poses much more legacy challenges than setting up a digital music streaming service from scratch. Further, Hirschmeier et al. [2] distinguish radio streaming services from music streaming services with respect to content. Radio has a heterogeneous mixture of diverse formats (news, features, interviews, audio dramas, etc.) with diverse lengths (from seconds to over an hour) and diverse contents (entertainment, politics, music, etc.), whereas a music stream is typically a rather homogeneous mixture of three to five minute songs. Program management is hence challenging for a nonlinear digital radio service. An enjoyable sequence of heterogeneous contents, filled with entertainment, jingles, jokes, and live moments, is part of the "radio listening experience" which is almost lost if content pieces are chopped into chunks and put into a media library for nonlinear random payout.

Therefore, the digital transformation of radio significantly differs from the digital transformation that the music industry had to undergo – at least from the value proposition perspective. An enjoyable radio stream is arguably much more difficult to assemble than a music stream since traditional radio provides a particular listening experience to which listeners relate to. Therefore, before building nonlinear radio as a digital service, one should elicit what constitutes the radio experience from the perspective of listeners. In other words, the key challenge is to define what radio is today and which design implications arise when radio broadcasters digitally transform their service offering. To the best of our knowledge, there is currently no outline on these characteristics. Hence, we formulate the following research questions:

What is the radio listening experience of classical linear radio? Which implications arise for the design of nonlinear radio services if broadcasters would hold on to them?

The remainder of this paper is organized as follows. First, we present our research approach, which consists of two phases. Then we present the characteristics of the radio listening experience in the consumer's view. On this basis, we derive seven implications for the creation of non-linear radio as a digital service. We conclude with a discussion, limitations and further research.

2 Related work

An increasingly large body of literature already exists regarding digital transformation, but little is directly related to designing spoken word radio services. Trying to be as specific as possible, we present related work from three adjacent fields – the digital transformation of radio broadcasting services with

focus on service design, the personalization of radio content, and the characteristics of radio.

Digital Transformation of Radio Broadcasting. The digital transformation is a phenomenon that has become increasingly important over the last decades [3]. Digital transformation describes the pervasion of everyday life by digital technologies [4], which also applies radio, though the exact boundaries remain unclear [5]. Within digital transformation, products and services offered to consumers, but also business strategies change [6]. The digital transformation of radio broadcasting regarding its distribution channels is often connected to Digital Audio Broadcasting (DAB) and DAB+ [7–10]. But also in content *production*, digital technologies have replaced existing technologies [11]. For example, music and other audio recordings are recorded, stored, and post-processed digitally which allows to mix multiple audio lines differently during playout [12].

Considering the digital transformation of services, service design is a multidisciplinary field dedicated to create new and innovative services [13–16] and fits well to radio. Of special interest is the service-dominant logic (SDL) [17]. SDL argues that not goods, but services are the fundamental basis of economic exchange. According to SDL, the value of goods results from the service they provide, not from owning them [18]. Since value emerges from use in this understanding, value is not created by companies alone – all they produce are value propositions [17, 19]. SDL has been used in various fields to re-conceptualize economic exchange and value creation [20].

Personalization of radio. From a personalization perspective, the digitization of radio is often connected to the idea of a nonlinear playout and comes in line with automatic assembly of individual playlists that match the interests of the user. Research on personalization in the audio realm is dominated by music recommender systems in such a way that for the term ‘radio recommendation’ one almost exclusively finds music recommendation, e.g. in [21–26] (as the term ‘radio’ may also be used for a pure music channel).

Focusing on personalization of spoken word radio, approaches exist to mix music streaming with spoken word content. For example, soundticker.com mixes Spotify music with news. Xie et al. [27] propose a mobile application that allows users to listen to personalized radio with focus on news. For linear radio, Liu et al. [28] proposed an approach that suggests which radio channel to switch to when being in the car. Hirschmeier et al. [29] presented an overview on requirements and solution approaches of recommendation for spoken word radio content.

Within radio personalization, one of the major challenges for nonlinear radio is not only to assemble playlist that match the interests of the user, but also to create playlists that are enjoyable. Sommers [30] focuses on understanding editorial decisions in order to elicit what constitutes a good mixture of content.

A lot of research on radio recommender systems seems to be conducted by companies rather than by academic institutes. The European Broadcasting Union

(EBU) has established a group focusing on Recommender Systems in their Technology & Innovation Department. As one of the most innovative broadcasting agencies in the realm of digital radio services, the U.S. National Public Radio (NPR) has set up a prominent nonlinear radio service. NPR One has become a popular smartphone app that integrates good usability with individualized radio consumption. NPR has researched on how to best assemble radio contents, called stories, and found out that it works well to group stories manually into lead stories, core stories, break stories, or invest stories [36], and to assemble those to a meaningful mixture.

Radio characteristics. Radio is commonly known to be consumed alongside other activities. This may be one reason why Koch [31] found that radio has a strong bias to form habits. This is particularly evident when thinking of radio as a source of entertainment whilst driving or getting ready in the morning. Further, a study by Grünewald [32] showed that radio has a strong emotional potential. Hence, radio consumers would mostly be loyal customers in the long run. For example, consumers' requests for local news determines radios' characteristics [33]. Torosyan et al. [34] observed that radio is important for listeners to identify and integrate with their domestic region. Thus, van der Wurff [35] argues that radio has chances to prevent its displacement by new formats with functional equivalence.

3 Research Methodology

To assess what radio means to listeners, we chose to combine (1) an exploratory approach to collect a large number of characteristics and (2) a grouping task to structure the characteristics into groups. Therefore, we followed a two-phase research approach.

The aim of (1) is to identify what the radio listening experience is and which characteristics it consists of. The goal of (2) is to confirm a structure that represents the characteristics of radio in groups, that makes it easier to address them.

First Phase. To obtain a list of characteristics describing the radio listening experience in its entirety, we chose to carry out a qualitative interview study. We developed the following questionnaire with three open questions that covered the radio listening experience to collect as diverse data as possible.

1. *In what occasions do you turn on the radio?*
2. *What is your first thought with regards to radio as well as listening to radio?*
3. *In which way does radio differentiate to other formats of media?*

We interviewed 59 radio listeners in face-to-face (11) and phone-based (35) interviews as well as over further channels in written form (13). The interviews

were conducted in German in April 2017 and all collected raw data was captured digitally. Our sample was chosen randomly, i.e. the participants were not selected depending on their radio consumption behavior. Some of them turned out to be regular listeners and others just occasional listeners. The interviews had a total length of 1746 words.

For data analysis, we chose a Qualitative Data Analysis (QDA) approach. In QDA as proposed by Mayring [37], frequently mentioned catchwords and paraphrases must be identified. We started with two coders doing a free coding to get an idea of catchwords and paraphrases that occur generally. In contrast to Mayring, we chose to identify not just frequent but all catchwords to obtain a complete picture. After the free coding, we joined and consolidated all codes, as suggested by Mayring, particularly the (1) linguistic unification of raw data, followed by (2) the generalization upon the abstraction level aimed, and the removal of duplicate codes (3). We proceeded with a selective coding to ensure we cover all characteristics stated by interviewees. Afterwards, the two coding versions were compared and conflicts were resolved by discussion, until a final coding was agreed upon. The methodology resulted in a coding frame that outlines the substance of the interviews conducted.

After identifying the characteristics, we developed preliminary categories. The categories served as the initial input for the second phase.

Second Phase. Our aim in the second phase was to verify the initially selected categories and to obtain a meaningful structure of the characteristics. For this sake, we chose a grouping task in which participants were asked to assign the characteristics from the first phase to groups. The methodology of the second phase was similar to that used by Wang and Strong [38] who grouped data quality characteristics into groups. Participants could also propose a new category or new characteristics if they felt something was missing, or propose to change the names of categories. Thus, the second phase also validated that the coding frame was accepted by a wider audience and that it comprehensively captured the characteristics of the radio listening experience. The grouping task was performed with 20 participants.

4 Results

4.1 Phase 1: Collection of characteristics

The purpose of the exploratory phase was to obtain a broad view on what constitutes the radio listening experience from a consumer value perspective.

In the final coding, we elicited 37 radio characteristics. During coding, we also set up a hierarchical structure in the coding frame to establish initial categories for the second phase. In total, we created five categories. The following depicts our coding frame, i.e. the 37 radio characteristics in the five categories.

(A) Attractiveness of content. Based on the collected attributes, the radio content appears to play a key role for listeners. Hence, we chose the attractiveness of contents as the first preliminary category, covering the following characteristics:

A1. Discussion panels on current topics	A2. Enjoyable commercials
A3. Weather forecast	A4. Enjoyable moderation A5. Listen to music
A6. Information about local and regional events	A7. Latest news and reports
A8. Live coverage of sport events	A9. Traffic alerts and messages

(B) Preparation and compilation of content. The preparation of radio content as well as individual combination of various contents is a second important aspect for participants. In the second category, we assemble the following characteristics:

B1. Consumption of a preselected playlist	B2. Good combination of music and news
B3. Fast and compact information	B4. Variety through diverse formats

(C) Interactivity. Based on the coding frame, interactivity is the third category we propose. Although radio is a one-to-many broadcast medium, from the perspective of an individual listener it is still personal and interactive. Human interaction and its positive impacts are subject of the corresponding category.

C1. Communicate with others (radio hosts or greet friends)	C2. Interactive live shows
C3. Human proximity through hosts	C4. Involvement of the listeners into the program

(D) Motivation of usage. Several motivations of usage were identified during the exploratory phase and grouped as a fourth category.

D1. Avoid silence	D2. Entertainment whilst driving, domestic work and meals
D3. Helps against loneliness and desolation	D4. Establish a positive atmosphere
D5. Helps to wake up through motivating content	D6. Part of the morning routine
D7. Alarm clock	D8. Nostalgia, positive memories D9. Rediscover music
D10. Passive, alongside consumption	D11. Relax and minimize stress

(E) Advantages towards alternatives. Several interviewees pointed out particular advantages of radio in comparison to its alternatives, particularly other audio media.

E1. Convenient in use	E2. Discovery of latest music, often transcending genre
E3. Focus on main activity and avoid distraction	E4. High availability whilst driving

E5. Free of charge or contractual obligations untouched	E6. Mobile data volume remains untouched
E7. No further need for an account or signing on	E8. No internet access needed
E9. Works right after switching it on, no configuration needed	

4.2 Phase 2: Grouping task

In phase 2, we aimed at obtaining a valid mapping between characteristics and categories through a grouping task. For each characteristic, the category that received most allocations was mapped to it.

None of the participants made use of the opportunity to add characteristics or to add or change any category. Therefore, we assume the preliminary categories to be confirmed. However, three characteristics were mapped to a different category than we initially expected, namely “traffic alerts” (A8 to E), “rediscover music” (D9 to A), and “discovery of latest music” (E2 to D). Although each of the characteristics had some sort of variation in the listeners’ categorizations, most of them had a clear majority towards one category. For 26 characteristics, more than 65% of the participants chose the same category whilst performing the grouping task. As there were only minor changes to our initial categories, we omit to present the categories again.

5 Implications for Service Design

If broadcasters want to preserve the distinctive characteristics of the classic radio listening experience, some implications are imposed on the design of future radio services based on the results. Some characteristics can be easily kept in digital radio services. Other characteristics, however, may be challenging to transform, and may thus represent those characteristics that distinguish an enjoyable digital radio experience from a less-appealing media library. In the following, we discuss the categories of characteristics and their implications.

5.1 Attractiveness of content

The content itself is a major part of the listening experience. According to our findings, listeners turn on the radio not just to distract themselves, but with the intention to consume content (A1, A3, A5, A6, A7). But experience shows that the content selection changes when transforming radio to a digital service. Media libraries so far contain only a subset of all contents that have been broadcasted. Many contents are usually missing for different reasons. First, licensing issues prohibit stations to also distribute some contents online. Second, moderations (A4) between two content pieces are typically cut off. Past live events like a lottery drawing for concert tickets or listeners calling that wish to hear a song or greet someone seem odd in a nonlinear p layout. Considering the digital transformation

of such live content, the question arises whether it should just be omitted. Further, longer live broadcasts of sports events (A8), traffic announcements (A9), and weather forecast (A2) are often excluded from delayed nonlinear consumption. However, our findings regarding radio characteristics indicate that these contents represent a substantial part of the radio listening experience and leaving them out fundamentally changes the listening experience. Hence, we formulate the following implications:

Implication 1. When designing a digital nonlinear radio service, it should be wisely considered if also linear (e.g. live) content should be integrated to some extent. Live contents are part of the listening experience valued by listeners and it might be risky to exclude this element completely. At least, listeners should be able to choose whether they want live contents to be included in their program or not.

Implication 2. Broadcasters should also consider whether the moderation between two contents can be modularized in a way that it is thematically independent from the content, in order to be used in nonlinear playouts at any time. Another solution could be to produce moderation pieces exclusively for nonlinear playouts, probably in an automated way. This implication therefore does not touch only the content provisioning, but reaches back to content production.

5.2 Preparation and compilation of content

Apart from the content itself, the presentation of content is another major part of the radio listening experience. A good mixture of content (B2) and variety (B4) reflects the appeal of radio. It seems difficult to specify what constitutes a good mixture or which mix appeals to a listener. Radio editors use their experience to create a good mix and continuously improve their program management skills for their particular audience over the years [30]. The consumption of a preselected playlist (B1) is one of the characteristics of radio. Eastman and Ferguson state that users “tend to choose channels [...], but expect someone else to have filled those channels/sites in an expert way” [39]. This “expert way” of assembling a radio playlist needs to be designed in digital radio.

Implication 3. Playlist generation for a nonlinear digital radio service reaches beyond the current approaches to recommend homogenous types of items, such as songs. Algorithms must be capable of providing enjoyable mixtures of contents of various types. Just as today’s broadcasters and channels have their own characteristics, broadcasters need to find out how to reflect their profile in automatic assembly of the program.

5.3 Interactivity

Interactivity is a challenge for a nonlinear digital radio service. On the one hand, smartphone apps enable rich interaction. On the other hand, interaction in traditional radio has usually been with the radio host via telephone, bringing human proximity into the interaction (C1, C2, C3, C4). In traditional radio, call-ins are very much the only way to get listeners out of a pure consumer role. A *prosumer* role [40] is however typical for today's digital content services. Since digital content is often embedded in social networks, sharing, commenting, and liking by other prosumers might compensate for call-ins to the radio host. However, excluding this interaction might imply losing one of the traditional radio characteristics.

Implication 4. Radio broadcasters have to consider interactivity in digital radio services – either through traditional forms of interaction with the broadcaster or through new peer-to-peer new ways of interaction with other listeners – in order not to lose an important characteristic of radio. The radio experience traditionally includes interactivity and it should be adapted to digital radio in new ways and channels.

5.4 Motivation of usage

The motivations to turn on radio are actually not characteristics of radio itself, but denote factors that are exogenous to radio. Still, the intentions to turn listen to radio, e.g. to have background entertainment (D1, D3, D4, D10) or to structure the day (D5, D6), should also be considered for future radio services. Future radio services can be designed in a way that they still address typical motivations of listeners. With personalization and context-sensitivity, future radio can adapt to individual contexts and situations even better than now. For example, when a listener is in a car every morning for 20 minutes (D2), a nonlinear radio service can adapt its program to that timeframe and time of day.

Implication 5. Future digital radio services may still address traditional usage patterns. The diverse motivations to listen to radio are key to understand what content should be played when and how to design interaction possibilities.

5.5 Advantages towards alternatives

The last category directly addresses advantages of radio over alternative media. Interestingly, issues with login (E7, E1), configuration (E9), mobile data consumption (E6, E8) and contractual obligations (E5) were mentioned.

Implication 6. Listeners do care for mobile data consumption, contracts and logins. As a nonlinear digital radio will most likely be web-based, radio broadcasters should consider to contract with mobile service providers to exclude

digital radio content from being counted in data volume plans, just as Spotify managed to agree on with several providers.

Implication 7. Users appreciate that radio does not need to be configured. This characteristic can easily be underestimated, but is part of the radio listening experience. In contrast, current recommender systems often require users to initially like or dislike certain songs, movies, or other content. Therefore, future radio services may offer configuration possibilities, but they should be aware that a required configuration possibly does not meet the radio listening experience in a traditional way. Also, logins might tear a future radio experience away from the traditional experience.

The implications mentioned above were derived from the current radio listening experience and are meant to be a comprehensive guide to shape and design future digital radio services. However, broadcasters and radio channels have particular profiles and radio characteristics and implications might apply to them differently.

6 Discussion and Limitations

From an information system's perspective, the analysis of radio characteristics provides insights and guidance on how to design digital radio services and to understand how the digital transformation of radio could be successfully accomplished.

There was some disagreement among participants regarding the assignment of the 37 characteristics to five categories. This could indicate that categories were possibly not mutually exclusive. In fact, from the coding procedure, independence of categories cannot be guaranteed. Still, the categories help to structure and understand the characteristics, and therefore also help to structure and understand the areas that need to be considered when designing a digital radio service.

This research discusses a forward projection of the "traditional radio experience" to the digital radio experience – which is part of a large digital transformation of radio. Future radio will very likely also open up new features and characteristics that have not been present in traditional radio, such as location awareness, speed, background noise, time, surrounding light etc. Nevertheless, in order to create successful digital radio experiences that resonate with current listeners and that enable a transition to new digital radio services, characteristics of the existing radio experience need to be kept in view while experimenting with new opportunities of digital radio services.

7 Further Research

The design of future digital radio services is a promising area of investigation for the information systems discipline to which this research tries to contribute.

Nevertheless, further research is necessary. Having established a comprehensive overview of important characteristics of the radio listening experience, it should be investigated which of them are more important than others and in which situations. Radio broadcasters themselves can reflect on their self-image, but to obtain the listeners' perspective, further studies with listeners need to be conducted.

This study focused on radio characteristics from a perceived customer value perspective. A fundamental assumption is hence that these characteristics might be worth maintaining. However, broadcasters might think differently about that. For example, some characteristics of today's radio experience might just have emerged due to limitations of technology of traditional radio. Therefore, further research could also take the limitations of traditional radio as a research object and starting point and determine what should be changed when transforming radio to a nonlinear digital service.

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